INDIA

Occasional Paper No. 171

ENRECA SERIES

PROCESSES OF INFORMALISATION IN RURAL NON-FARM SECTOR: SILK PRODUCTION IN WEST BENGAL—INSTITUTION AND ORGANISATION

DEBDAS BANERJEE

CENTRE FOR STUDIES IN SOCIAL SCIENCES,
CALCUTTA

Occasional Paper No. 171

ENRECA SERIES

PROCESSES OF INFORMALISATION IN RURAL NON-FARM SECTOR: SILK PRODUCTION IN WEST BENGAL—INSTITUTION AND ORGANISATION

DEBDAS BANERJEE

JANUARY 2000

Centre for Studies in Social Sciences, Calcutta
10, Lake Terrace, Calcutta 700 029
Phone: 466-6472/5477
Fax: (91) (33) 466-6958
E-mail: postmast@csssc.ernet.in

Contents

Processes of Informalisation in Rural Non-Farm Sector: Silk Production in West Bengal—Institution and Organisation

1 Introduction

The post-colonial trajectory of Indian industrialisation does confirm decreasing ability of the industrial sector to create enough jobs for the large numbers of unemployed and underemployed population. The percentage of economically active population (main workers) was 33.8, i.e., 286 million out of the total population of 846 million (*Census* 1991). There has not been much change in this percentage in the last 20 years—33.5 in 1981 and 32.8 per cent in 1971. Of the total working population, 259 million (about 91 per cent) are in the unorganised sector, and 27 million in the organised sector.[1] In the unorganised sector, among others, there were 111 million cultivators, 75 million agricultural workers, about 6 million in construction, and 10 million[2] in household industries (manufacturing, processing, servicing and repairs). Of the latter, about 7 million are engaged in rural household industries. In other words, most of the working population is engaged in the rural sector without any proper records and a very small segment is in regular employment and even a smaller proportion in the public sector undertakings.

The percentage distribution of operational holdings and area operated, as in 1991-92 (GoI, NSSO, NSS 48th Round), shows that about 35 per cent of the aggregate land are being operated by top 5 per cent of the households, in rural India as a whole (Gini coefficient = 0.6409). The inequality in operational landholdings is found to be lower in rural West Bengal (WB) than that in all-India (AI)—top 5 per cent operate about 25 per cent of the rural operated area (Gini coefficient = 0.5846)—than in all-India (AI). Notwithstanding, there has been a growing marginalisation of peasantry in WB. The percentage of *marginal* holdings to the aggregate number of holdings in WB was 61.2, 74.3 and 80.7, in 1970-71, 1981-82 and 1991-92, respectively. On the other hand, the percentage of small holdings, in WB, declined from 22.8 in 1970-71, to 15.8 in 1981-82, and thereafter to 13.4 in 1991-92.

The growing *marginalisation* of the peasantry has consequences for the wage market. There is a growing *casualisation*—the proportion of the usually employed as casual labour—of rural labour force over the last three decades (GoI, NSS 50th Round). The situation in WB is worse than the all-India average.[3] In addition, the unemployment and underemployment (usually

employed but seek or are available for additional/alternate work) among rural labour force is significantly high. The 'current daily status' rural unemployment rates (the number of persons unemployed per 1000 persons in the labour force) in 1993-94 was 56 in AI as compared to 91 in WB. Moreover, the number of usually working (principal) persons (15 years and above) who sought or were available for additional work per 1000 usually working (principal) persons (15 years and above), in rural areas. in 1993-94, was 67 for AI as compared to 110 in WB. The situation for 'female' in WB is still worse than that in AI, in general, or than for 'male' in WB. Finally, as compared to AI, WB is characterised by a much higher average level of rural non-agricultural employment at comparable dates (Chandrasekhar 1993).

The existence and growth of rural non-farm employment may be inquired as to (a) whether the wage in non-farm is higher than that in the farm sector—'growth orientation'—or, (b) whether this is a 'residual' of agricultural development ('distress' orientation)—non-farm wage is lower than farm wage rate. If inter-district variations are considered, there is little evidence that points to the existence of a relationship between the trend rate of agricultural growth and the level or changes in the intensity of participation in non-farm activities (Chandrasekhar 1993). The literature on 'rural led' growth path generally draws heavily upon Kuznets' 'structural change' (Kuznets 1974). In other words, agricultural growth which generates additional incomes and demands, some of which can be met with local resources and skills, leads to a process of occupational diversification, and so on. The existence of a 'push' in favour of rural industry, however, is itself inadequate to ensure the growth of the sector. There must be a critical level of 'expected' income/return to have a quasi-permanent migration to the sector, and form the *base* for future *pull*.

We will examine the forms of labour, technology and the organisation in one of the many rural occupations, which have been there, for quite a long period, regardless of the growth path of agriculture. Silk production has been an important traditional occupation in Bengal, at least, for the last three hundred years about. This must have positive effect on productivity *via* learning-by-doing, in this region. The colonial policy almost wiped out the industry in Bengal, by the turn of the century. The increased demand during the Second World War marginally saved the industry. The growth of the industry has been particularly noticeable since the beginning of the 1970s. The steady world demand and, at the same time, the decline of the activity in

the high-wage economies such as Japan, have kept the traditional craft still vibrant in WB.

India has been able to increase her silkgoods exports steadily—Rs 2550 million in 1987/8 to Rs 7891 million in 1993/4 and further to Rs 9263 million in 1997/8. The United States consumed the largest part of India's mulberry silkgoods exports (about 35 per cent), followed by Germany (14.4), UK (9.8), France (4.1), Canada (3.4), UAE (3.4) and Singapore (3.3), in 1997 (*Indian Silk* various issues). These together tell about the *ex-ante* demand for silk in the hard currency area as well as the global linkages of the local production. About 30 per cent of WB's mulberry silk output are being exported abroad.

Silk production (we consider, here mulberry silk only—the largest sector) consists of a chain of activities, namely, mulberry (food for silkworm) cultivation, seed and commercial silkworm rearing in four to five seasons in a year (depending on the agro-climatic conditions), reeling of silk cocoons into yarn, and spinning/twisting. The industry is generally iocated in the rural areas yet it has weak input-output linkages with the agricultural sector as such; the silk output is basically for the up-market demand. Sericulture, referring to mulberry cultivation and rearing of silkworms, employs about 0.415 million persons (GoWB, *Economic Review*). There is no reliable estimate available on employment in the silk reeling or silk weaving, either. However, using input-output relationships, the tentative estimate shows that about 0.1 million persons attached to reeling and weaving, taken together. This total of about 0.5 million of employment in the unorganised silk production sector may well be compared with 10,000 odd registered factories in WB employing about 0.9 million workers (GoWB, *Economic Review*).

The objective of the study is to delineate the existing configuration of institutions and organisations and show the weaknesses of 'methodological individualism' as an explanatory instrument. In economics, as behavioural science, the starting point is the individual and exchange; production is secondary and is a field of application of exchange, which shows up in the notion of factor markets. In political economy, on the other hand, the normal prices or the prices of production depend upon the conditions of production pictured by the various production coefficients and upon the money wage level and the rate of profits (Ricardo-Sraffa system). In the real world, however, both money wage and profit rates are governed by a complex set of

institutions.

Institutions are complexes of norms, rules, and behaviours that serve a collective purpose whereas organisations are a structure of roles. While many institutions are organisations (e.g., household, firm, cooperative) many institutions are not organisations (e.g., money, the legal system) and many organisations are not institutions (e.g., a particular grassroots organisation).

2 Data

This study draws most of the material from field-survey in the major reeling centres in the state, especially, in the districts of Birbhum, Malda and Murshidabad (Table 1). Unless otherwise mentioned data used in the text and in tables would refer to the selected (sample) households. In many occasions the *sample* is nothing but the targetted *population* itself. The price data are evidently out of date. However, those have been used for cross-section analysis and thus perhaps would not invalidate the analysis or the observations made.

3 Silk production: the technology

India is perhaps the only country where the four varieties of silk i.e., mulberry, tasar, eri and muga are produced commercially. While mulberry silk constitutes more than 90 per cent and muga about 0.5 per cent of the aggregate silk production in India tasar and eri share between them the remaining volume almost equally. Silk is a protein fibre produced by the silkworm for spinning a cocoon (for a detailed account, *see* Ullal and Narasimhanna 1987). The filament is continuous and ranges in length from 350 metres in Indian breeds of silkworm to 1800 metres and more in the Japanese varieties (*ibid*). Silk is obtained from these cocoons by a process described as reeling which is the unwinding of the filament from the cocoon, after stifling the pupae.

Table 1: Reeling units in West Bengal: the sample

District	Block	Village cluster	Total no. of reeling units	Selected no. of units	Rearer *cum* reeler	Exclusive reeler
Malda	Kaliachak-I	Alipur	73	70	68	2
		Sershahi	uk	138	109	29
		Marupur	uk	52	48	4
		Mozampur	84	83	65	18
		Khaltipur	310	142	131	11
		Gayesbari	145	48	43	5
		Choto Sujapur	140	46	43	3
		Bakharpur	100	50	49	1
	Total			629	556	73
Murshidabad	Nabagram	Sankoghat	43	19	19	-
		Balaspur	uk	21	21	-
	Beldanga-I	Majhyampur	uk	16	16	-
	Khargram	Alinagar	93	16	16	-
	Raghunathganj-II	Hatibandha	64	22	-	22
		Pananagar	22	22	-	22
Birbhum	Nalhati-I	Tailpara	7	7	7	-
	Total			123	79	44

Note: uk = Unknown.

On an average, about 200-300 grams of silkwaste are left out of one kilo of raw silk reeled (both mulberry and non-mulberry). Besides this reeling waste, wild and cultivated (mulberry) cocoons which cannot be reeled, mainly the pierced and cut cocoons (in rearing or grainage houses) and some amount of inferior cocoons which are unsuitable for economic reeling process, are used to produce silk yarn by spinning. The spun yarn is less even. It constitutes about eight per cent of the aggregate silk yarn produced in the country (Sonwalkar 1993).

The operation of unwinding the silk filament, a bave forming the cocoon, is called *reeling*. There are three distinct types of reeling viz., the country charkha (popularly called *katghai*), cottage basin, and filature. The katghai is a simple appliance that can easily be manufactured by the village artisan at a cost of about Rs 200-300. This can be installed in the backyard. Two persons viz., a reeler and a turner (of the wheel) manually operate it. The total cost of installing a katghai is around Rs 1400.

The charkha reeling process has in-built inadequacies for reeling quality silk, in general, and the warp yarn, in particular. It has no mechanism to control

the temperature of the water, which is crucial for adequately unwinding of silk filament from the cocoon, and, hence, leaves relatively higher amount of silkwaste. Secondly, the reel has no brake mechanism so that it could be stopped immediately after detecting a split in the thread. Thirdly, since the yarn produced in katghai cannot be re-reeled, due to technical reasons, the equipment is unable to produce warp yam of required grade.

The cottage basin, on the other hand, as a device is an improvement over charkha and it is indigenously designed on the principle of Japanese multiend machine (*ibid*). Here cooking of the cocoons is done separately in a boiling water basin and reeling is done in a hot water basin. There are a number of basins in a single unit, and each basin has its own independent croissure frame designed for application of travellette croissure. The reels are of standard size and pattern, and fitted on a common transmission shaft, and thus are driven by a common wheel by a single turner. Each reel is fitted with a brake mechanism of simple design. It has the added advantage of re-reeling. If raw silkyam were reeled directly on to the larger reels it would contain insufficiently dried threads, and consequently hard gum-spots, which degenerates the quality of the silk. The improvement could be by reeling the raw silk from the basin first on to small reels, and then re-reeling on to larger reel after appropriate drying. A unit with 10 basins is estimated to be economical (*ibid*: p.69). Now, even bigger power driven units of 40-basins are being installed. Sometimes steam generated in a boiler is used for heating the water in cooking and reeling basins and also to stifle the cocoons.

The quality of reeled silk is far superior in the filature unit (automatic reeling machine). A filature utilises steam boilers for providing steam to heat up the water in the reeling-basin and also for other ancillary operations like stifling of cocoons, boiling of cocoons, etc. The standard sized reels are rotated by the use of electric power. Quality testing for the yam could be carried out even during the reeling operation. In other words, it has a denier[4] control device to maintain constant raw silk denier and as a result the evenness of raw silk reeled is better. The reeling units are more compact and at the same time comprehensive, provided with automatic stop-motion, etc., and thus substantially enhance the productivity of labour. There are two filature units, both run by the Department of Sericulture, Government of West Bengal, one each in Malda and Murshidabad. However, the unit in Murshidabad had operated for a couple of months after it was installed, thereafter closed down.

In India, charkha contributes more than 50 per cent to the aggregate silk production, cottage basin and similar system about 40 per cent, and the filature system about five per cent while the rest is accounted for by *doupion*[5] silk production (*ibid*: p.65). The cocoon drying, cooking and reeling technique should be different for different types of cocoons. It is found that automatic reeling machine which is an improved version of the multiend reeling machine designed and extensively used in Japan for reeling univoltine and bivoltine cocoons[6], is not commercially viable for multivoltine[7] hybrid cocoons in Indian conditions (*ibid*: p.79). To note, more than 90 per cent of the mulberry cocoons in India are multivoltines. Broadly, three 'races' of silkworms are widely reared in West Bengal: (i) Bivoltine (B_i)—a Japanese variety, (ii) Nistari (N)—a traditional, hardy, low yielding 'local' race—and (iii) cross-varieties of B_i and 'local' races. 'Races' (i) and (iii) together constitutes the high yielding varieties (HYV). While about 450 kilos of mulberry leaves are required to produce about 13 kilos of Nistari cocoons the same amount of leaves, with marginal increase in the intensity of labour (in terms of attention) and the same labour-time, could produce about double the amount of HYV cocoons. The HYV cocoons by dint of the much longer filament length per cocoon than the local 'races' seem more profitable. We shall henceforth use, as it is officially termed, 'F_1' for the hybrid of Nistari and Bivoltine, and 'Jaya' for that of Pure Mysore (a hardy race, traditionally found in the old-Mysore area, now cultivated extensively) and Bivoltine. These two are most common among the HYV silkworm 'races' reared in West Bengal.

Apart from the widespread use of country charkha there are a number of improvised cottage basins known as *improved charkha* (IC), in West Bengal. The improvement has been made in the system of rotating the reels, over that in katghai. A single turner is able to rotate, at the maximum, five reels at a time, fitted to a common shaft. This renders the unit to substantially reduce the wage costs on account of the turner. The IC is also fitted with an additional croissure (costs not more than Rs 1.25) which gives a better twisting to the thread, unlike in katghai operation. Also, the reels in the IC, unlike in katghai, could easily be separated from the shaft and directly set for the re-reeling operation. However, in the IC, like in katghai, the same basin is used for boiling and cooking of the cocoons. Moreover, the temperature control mechanism is as tentative in IC as it is in katghai.

The cost of a 2-basin IC (including the re-reeling unit) is about Rs 8000 (as in June 1993). And the cost of installation including the iron-pots, etc. turns out to be around Rs 11000. An additional—often optional—investment of Rs 7000 is required to erect brick-walls and a tiles-roofed shed. The cost of installation of IC with more number of basins, however, is not linearly proportional (Table 2). On the other hand, installing a katghai is much cheaper. As compared to the high initial capital requirement for other types of reeling devices, a four-katghai unit requires about Rs 10000 (including the shed).

Table 2: Cost of installation of katghai and IC (at June 1993 prices)

Type of unit	Cost of implement and others	Cost of shed	Total
1-basin katghai	1,500	1,000[a]	2,500
2-basin katghai	3,350	1,200[b]	4,550
2-basin IC	10,750	6,250[c]	17,000
3-basin IC	18,000	17,000[c]	35,000
5-basin IC	25,000	17,000[c]	42,000

Notes: (a) Thatched-roof on a bamboo structure; (b) tiled-roof on a bamboo structure; and, (c) brick-wall with tiles-roofed.

The operating cost of production per unit, wage-rate remaining the same, is less in IC as compared to katghai. And, it declines with the increase in the number of basins in the unit. Because, the turner who turns the wheel for a single reel in a katghai could turn five reels at a time with the same or marginally increased effort, wage remaining the same (Table 3). In katghai and single basin IC, the helper who usually puts fuel to the fire and does other petty jobs, also works as a turner. The operational cost difference in the two types of units becomes apparent as the number of basin increases, revealing the advantage of IC. Also, IC has production *flexibility*. While katghai is unable to produce the kind of warp that is now being used in weaving IC could produce both warp and the weft. In response to the relative price of warp and weft, the demand conditions in the market for different types of yarn, and the availability of different varieties of cocoons, etc., a reeler could easily decide on the product-mix in an IC. Moreover, the reeling of HYV cocoons in IC reduces the percentage of siikwaste which is comparatively higher in a katghai, leading to

cost efficiency.

Table 3: Unit-wise operating cost (Rs) for improved charkha (IC)

Item	1-basin	2-basin	3-basin	4-basin	5-basin	6-basin
Reeler	25	50	75	100	125	150
Turner	-	28	28	28	28	28
Helper	15	15	15	30	30	30
Fuel	20	40	60	80	100	120
Miscellaneous	5	7	10	13	17	20
Total cost	65	140	188	251	300	348
Cost of reeling 10 kilos of (green) cocoons	65	70	63	63	60	58

Notes: (a) includes costs of bidis, etc., for the workers.
Sometimes a supervisor (*sardar*) is appointed in units of 3-basin and above.

4 The gender face

There is nothing peculiar to the reeling process that renders it unsuitable as an occupation for women. However, the direct participation of women in reeling, either as family member or as hired labourer, is missing. Usually the reeling operation starts early in the morning and it goes on for 8-9 hours, up to noon. Once the work starts it has to be done continuously, otherwise the fuel-costs would be higher. In the poor wage-labour households usually the meal is cooked once a day, either in the morning before the men or women or both of them go out for work, or in the evening. Thus, engagement in reeling as hired labour is not a problem for these women. However, in the rearer, or reeler households a domestic routine is usually followed, the major part of which coincides with the routine of reeling activity. Thus the women in the family are perhaps disallowed. But that does not explain the employment of only males as hired labour.

Women, not allowed to enter the reeling labour market, however, have monopolised spinning of silkwaste (*jhute*). The process of mulberry silk reeling leaves different types of silkwaste as by-product. These can be classified into (a) waste from cocoons, and (b) reeling waste. The former mainly consists of floss (i.e., silk from the outer part of the cocoon; it is of low grade and is available only in small amounts), and discarded cocoons such as pierced, double, stained, etc. And, the reeling waste comprises cooker's waste, reeler's

waste, and basin refuse or boiling off waste. The flosses which are separated from the cocoons in the process of reeling, and the silkwaste are processed into yarn—spun silk. The silkwaste obtained from the reelers is first, cleared of the stifled pupae and other wastes. The 'cleaned' silkwaste is then boiled with a little amount of caustic soda, and dried in sunlight. Then spun in an improvised charkha the wheel of which is operated by the feet, known as *paddle charkha*.[8] The hourly income of the women from *jhute* spinning varies between Rs 1.70-2.55 (Banerjee 1993).

Yarn is also spun, by the women, out of 'cut' cocoons, i.e., out of those from which moths have been allowed to emerge mainly for the purpose of 'seed' preparation, or which were cut for the purpose of 'testing'. These are available in bulk in the government and private grainages. Occasionally, the Central Silk Board, Government of India (GoI), and the state sericulture department sell these out in auction. A few private traders have practically monopolised the purchase of the pierced cocoons from the government grainages. The traders then put out, in small batches, to the women spinners. The spinning is done manually with *takli* (spindle). The end product is known as *matka* yarn. The income per hour of spinning varies between Re 0.50 and Rs 1.50. The income is higher when the spinner obtains the raw material from the cooperative society rather than the private trader. A comparison of the hourly income (or wage) in *matka* spinning with *jhute*, when the labour process has nothing much to distinguish from one another, does indicate the existence of differential contracts for the same product, with the same agents but by different principals.

5 Types of reelers and labour use pattern

Reeling in West Bengal is predominantly a household and small-sized activity, excepting the few cooperatives/registered societies, the DoS-run filature unit, and a few medium-sized enterprises located in Kaliachak. The private reeling activity is done by two groups of people classified as (a) the rearer-reelers, and (b) the exclusive reelers. In most of the traditional commercial (i.e., cocoons produced for reeling and not for 'seed' purposes) rearing areas, the rearers are reluctant to sale cocoons and do the reeling by themselves. The relatively small producers among them do not purchase any cocoons while others collect cocoons over and above their own yields. The number of exclusive reelers, that is, those who do not rear silkworms, is generally a rather subdued phenomenon, and concentrated in a few pockets. Generally, the exclusive

reelers are reluctant to use family labour in reeling, irrespective of the size of operation (Table 4). These units deserve to be considered as non-household small scale.

Table 4: Labour use pattern in Kaliachak (CCA)

Village cluster	No. of rearer *cum* reeler	No. of exclusive reeler	Number of units/households using family labour	
			Rearer *cum* reeler	Exclusive reeler
Alipur	68	2	5	-
Sershahi	109	29	2	-
Marupur	48	4	3	-
Mozampur	65	18	5	-
Khaltipur	131	11	9	1
Gayesbari	43	5	6	-
Choto Sujapur	43	3	3	-
Bakharpur	49	1	3	-
Total	556	73	36	1

This division of the reelers, however, has nothing to do with differential income groups. The technology-in-use is also not consequent upon the pattern of supply of inputs. Often the relatively big rearer-reelers are found to be processing cocoons in katghai whereas smaller (exclusive) reelers using IC. The rearer-reelers could be further differentiated according to the volume and types of yarn produced per unit, pattern of labour utilisation, sources of cocoons, etc. Also, there is location specificity of the industry. In general, the Kaliachak block, in Malda, in so many respects including relative density of the activity, exhibits features which are either not found or are in a nascent stage in other silk producing zones in the state. We would thus like to characterise the Kaliachak area as the *central commercial area* (CCA). Let us call the other reeling centres in Murshidabad and Birbhum as *peripheral* (PA).

There are a large number of rearers who are otherwise classified as reelers, since they produce yarn out of their owned yield of cocoons and sale those, do not even own reeling implement. Those who do not find it worth to install a katghai to process the low volume of self-produced cocoons, or do not have the required means to install one, get their cocoons reeled in neighbour's katghai. The community form of exchange of resources is evident in the latter

Table 5: Distribution of reeling units according to the volume of yarn (kilos) reeled per annum, in selected areas

Block/ Village	Up to 30	30-50	50-100	100-200	200-300	300-500	500-800	800-1200	1200-1800	above 1800	Total no of units	Average output (kilos)	Coeff of variation
Kaliachak													
Alipur	2	2	17	20	8	14	4	2	1	-	70	258	6.1616
Sershahi	9	14	22	33	20	26	10	3	-	1	138	249	13.2737
Marupur	10	4	6	14	6	8	2	1	1	-	52	218	4.6244
Mozampur	1	6	9	19	20	17	6	2	3	-	83	313	7.6674
Khaltipur	8	10	41	43	27	7	3	1	1	1	142	185	12.4492
Gayenbari	7	3	12	12	2	8	2	-	2	-	48	227	5.3450
Choto Sujapur	2	1	8	15	7	7	5	1	-	-	46	255	4.9221
Bakharpur	4	5	12	22	4	3	-	-	-	-	50	133	7.8133
Sub-total	43	45	127	178	94	90	32	10	8	2	629		
Nabagram	25	9	4	2	-	-	-	-	-	-	40	33	5.2089
Khargram	13	2	1	-	-	-	-	-	-	-	16	22	2.9626
Beldanga	1	1	1	12	1	-	-	-	-	-	16	136	4.1190
Nalhati	-	3	3	1	-	-	-	-	-	-	7	71	1.1834
Sub-total	39	15	9	15	1	-	-	-	-	-	79		
Raghunathganj	-	-	10	13	6	10	1	2	2	-	44	315	4.3476

case since most of the katghai owners are found to have allowed the neighbours to use their implement at almost free of costs. The customary practice is to offer the silkwaste consisting of residual cocoons in the reeling basin, to the katghai-owner; the waste is a good cattle-feed.

The *Census of India* (GoI) defines an household industry as that conducted by the head of the household himself or herself and/or by the members of the household at home or within the village in rural areas, and only within the precincts of the house where the household lives in urban areas. The larger proportion of workers in household industry consists of members of the household including the head. The industry is not run on the scale of a registered factory that would qualify or has to be registered under the Indian Factories Act. The main criterion of a household industry is the participation of one or more members of a household. While that characterises small scale reeling largely in the peripheral areas the *concept* requires to be modified to explain the household reeling in CCA. It is often found, in CCA, that a small reeler is operating his unit entirely with hired workers while himself is working as wage labourer elsewhere, although the two wage rates are often the same. This is primarily because of the low volume of job at the owned unit. Since the processing of cocoons would require a few days only in the owned unit, the owner in order to increase his aggregate family income tries to get a job in unit (reeling) that provides him a longer term employment. The large scale units providing seasonal but relatively longer term employment prefer to employ persons having adequate skill, and who would continue with the job during the entire period of operation. The *continuity* ensures consistency in the grade of yarn produced, since the production process is more dependent on human skill than on the machine for product standardisation. This kind of labour-substitution allows for different kind of business accounting principle for the household unit as compared to those who solely utilise family labour, or who do not employ family labour at all.

The size of operation and the labour-use pattern do not reveal a systematic relation. In the PA, in general, the (weighted) average annual volume of reeling per unit was about 55 kilos of yarn as compared to 231 kilos in the CCA. Raghunathganj (Hatibandha and Pananagar), outside CCA, is exceptional by its high level of annual output (315 kilos; comparable only to Mozampur in CCA) (Table 5). Still, unlike in CCA, the reelers mostly employ family labour. Further, the average duration of reeling per unit per annum is

found to be 118 days in CCA, 60 days in PA (excepting in Pananagar where it is 126 days and Hatibandha with 80 days work).

So far as the technology-in-use is concerned, in the PA, except in Raghunathganj, there is practically no reeling implement other than katghai. On the other hand, in CCA, although 400 out of the 679 reeling units are ICs yet. katghai constituting more than 41 per cent of the reeling units, is a matter of concern. However, the variation in the pattern of technology use within CCA is significant (Table 6). Katghai predominates in places such as Choto Sujapur, Bakharpur whereas almost all of the reeling units in Sershahi, Marupur employ IC.

Table 6: Distribution of reeling units, by type, in CCA

Village cluster	Katghai	Improved charkha
Alipur	3	67
Sershahi	1	138
Marupur	1	51
Mozampur	1	83
Khaltipur	133	47
Gayesbari	44	12
Choto Sujapur	46	1
Bakharpur	50	1
Total	279	400

Not a single household in Nabagram, Khargram and Nalhati said that the reeling was their primary occupation. Moreover, the low volumes of reeling in these centres have made the katghai operation economic. On the other hand, in CCA—excepting the marginal reelers whose annual yarn output does not exceed 50 kilos—the reeling is considered as main occupation by most of the households. In other words, in one place katghai provides the subsistence, in the others it augments family income. The pattern of technology-use is explained by factors other than just the relative weights of the various activities in the aggregate family income. This is prominently evident in Beldanga. Out of the 16 households surveyed, ten households consider reeling as their main occupation. Yet, all the reeling units, there are katghais.

The distinctive characteristic of an IC and its locational distribution partly explain the differential product-mix at CCA and PA. While both the warp and weft are produced in the CCA it is the production of weft that characterises

reeling in all other centres. Despite a large number of ICs in Pananagar (in Raghunathganj), that is, in PA, warp is not being produced there. Second, the production of warp in CCA is not proportionate to the number of ICs in-operation there. About 55 per cent of the reeling units in CCA are ICs whereas the output of warp does not exceed 25 per cent of the aggregate yarn production. However, the weft produced in CCA is superior to that in the peripheral centres, in general. In the periphery, the average weft produced in katghai is of 30/32 denier, and that in IC 24/26 denier. By comparison, the average katghai produced weft in CCA is not more than 26/28 denier and that of IC 20/22 denier.

The requirement of warp is not less than 30 per cent of the total yarn used in a silk cloth, and it goes up to 50 per cent depending on the texture of the fabric. When this is compared with the trend of production of warp in the state a gross imbalance becomes evident. The excess demand of warp is met up with imports from other states mostly from Karnataka.

Comparative cost analysis

The costs of reeling weft only in katghai and, weft as well as warp in IC, and the corresponding sales revenue are shown in Table 7. In order to compare, we consider two katghai units as a '2-basin katghai', and leave aside wage variation across the regions as well as technology. It is evident that, in IC, the reeling of warp yields Rs 102 per day of operation whereas that of weft Rs 55. Weft reeling in katghai fetches more—Rs 60—than that in IC.

If we allow a 10 per cent increase/decrease in both the cocoon and yarn prices the relative profitability changes for the three different types of yarn. While the *return* from warp yarn increase/decrease by 28.4 per cent that from weft in IC by a greater margin, i.e., 42 per cent. The weft in katghai, on the other hand, exhibits a change of 33.3 per cent. In other words, in a situation of rising prices warp reeling in IC becomes more profitable than others. And, katghai rather than IC is found to be more appropriate technology for reeling weft when price fluctuates widely.

The cost calculation varies significantly depending upon (a) the mode of cocoon purchase (in cash or on credit), (b) the size of operation, (c) whether the cocoons are procured locally or are bought from far away places, (d) the season of reeling, (e) the mode of disposal of yarn—sold in small batches, or in bulk, (f) whether the yarn is sold in cash or on credit, and (g) the yarn buyer.

In the same cluster of villages, the buying price of cocoons and the selling price of yarn vary among the units. Accordingly, the profitability of the

units varies widely. For instance, one unit bought F_1 cocoons at Rs 1600 per 40 kilos while another in the same village bought the same at Rs 2400. Moreover, the former fetched Rs 600-800 per kilo of warp yam while the latter sold the yam at prices Rs 680-720. Why the latter bought cocoons at such a high price when the yam prices were not compensating? Or, was it the 'expected' price of yam that induced the unit to buy raw material at any price?

The seasonality (lean-peak) of reeling renders unequal opportunities to the reelers. Usually, December-January, March-April, and May are considered to be the peak seasons in the sense that the HYV cocoons become available. Moreover, the *renditta*[9] is relatively high in these seasons. On the other hand, in July-August and September/October seasons the yield of yam becomes low and reeling of the cocoons difficult. A reeler who could process 10-12 kilos of cocoons per basin per day, in the peak season could hardly process 8 kilos in the lean season. Many of the small reelers who could not afford to hold stocks of F_1 or other HYV cocoons from the harvests in March-April, or May season, and who otherwise reel warp yam have to reel weft yam with Nistari cocoons. Also, the yam price during the lean season declines considerably.

Table 7: Average costs (Rs) of reeling and return per day of full operation (June 1993)

Sl. no.	Item	Type	2-basin Improved Charkha		2-basin katghai
			Warp yarn	Weft yarn	Weft yarn
1	Labour	Reeler @Rs 28	56	56	56
		Turner @Rs 28	28	28	56
		Helper @Rs 15	15	15	-
		Re-reeler @Rs 30	30	30	-
2	Cocoons		360 (1)	650 (2)	780 (3)
3	Fuel	Coke @Rs 90 per quintal	45 (4)	36 (5)	36 (6)
4	Costs of cocoon drying		10	10	10
5	Miscellaneous		10	10	-
6	**Total cost**		554	835	938
7	Yarn output (kilo)		0.810	1.75	2.40
8	**Value of yarn**		648 (7)	875 (8)	984 (9)
9	**Income** (8-6)		94	40	46
10	Income from silkwaste		8	15	14
11	**Income**, total (9+10)		102	55	60

Notes: (1) 9 kilos of F_1; (2) 20 kilos of Ni; (3) 24 kilos of Ni; (4) 50 kilos; (5) 40 kilos; (6) 40 kilos; (7) @Rs 800 per kilo; (8) @Rs 500 kilo; (9) @Rs 410 per kilo.

Finally, the inter- and intra-regional variations in wages and working hours result in varying economics of reeling. Wage rate in the CCA is lowest among the selected reeling centres (Table 8). The use of child labour in reeling also varies across the regions. In the PA reeling centres, most of the reeling units are katghais and only two workers are employed per charkha, excepting a few where an additional man-power as helper is employed. However, while adult males work as reelers there is widespread use of child workers as tumer-cum-helper in the PA. The wage of child labour being lower

than the adult worker the PA seems to have a competitive edge over CCA. Further, the child workers in CCA are engaged only in jobs like supply of fuel and water, put cocoons into the basin, etc., and earn even lower wages than that in the PA. On the whole, the use of child labour in CCA is not as widespread as it is in the PA. This is primarily because of consistent supply of non-migrant adult wage labour in CCA, despite higher agricultural growth rate in Malda than in Murshidabad or Birbhum.

The wage rate in the typical private organisation is higher than that in the *khadi* societies. The wage in the latter is guided by the apex organisation, that is, the Khadi and Village Industries Commission (KVIC) that works under the administrative control of the Ministry of Industry, Government of India as part of the Department of Small Scale and Agro and Rural Industry. The KVIC has also created an organisational base for the development of KVI sector. This consists of 30 state Khadi and Village Industries Board(s) (KVIB).

There are broadly two types of production organisations certified and assisted by KVIC/KVIB, viz., (a) cooperative society, and (b) society for charitable purposes. All the members of a cooperative society are equity holders and the *net profit* of the society is distributed among the members by way of bonus or dividend. On the other hand, the West Bengal Societies Registration Act, 1961, allows any seven or more individuals to form a society for charitable purposes. Most of the charitable silk khadi societies engaged in weaving and/or reeling are found to have floated with members who are closely related to each other, and thus largely constitute family-based business

Table 8: Regional variation in wages and working hours of reeling

Block	Category of worker	Working hours per day	Wage[1] (Rs)
Kaliachak	Reeler	8	25-27
	Turner	8	27-30
	Re-reeler	8	27-30
	Helper	8	12-15
Raghunathganj	Reeler	10	31-40
	Turner	10	12-31
	Re-reeler	10	35-40
Beldanga, Nabagram, Khargram	Reeler	10	30-40
	Turner	10	15-25
	Re-reeler	10	20-30

Note: (1) includes payments in kinds also such as tiffin, meals, bidis, etc.

organisations. There were, in December 1993, altogether 247 charitable silk khadi societies as against only 18 cooperative societies certified by KVIC, most of which are located in the districts of Malda and Murshidabad. The KVIC revised the rates of wage for spinning, reeling, weaving, etc., and which were made effective from 1st December 1992, in West Bengal. According to the revised rate, a reeler working in the khadi society is supposed to get Rs 22 per day while a turner gets Rs 21.

6 The market

The weavers, mostly in the state ultimately consume bulk of the yam produced locally. There are concentrations of silk-weavers in the districts of Birbhum, Murshidabad and Bankura. And many of these weaving centres are two-three hundred years old. Thousands of weavers in these centres generate effective demand for the domestic silkyam. However, the reelers directly through an open market do not meet the weavers' demand. The weaver buying yam directly from the reelers is insignificant. Only a few of the weavers work independently, that is, they buy yam from the market and sell the finished materials in the market. Otherwise, most of the weavers are organised under the cooperative or other registered institutions. They get the supply of yam from the societies and return the finished fabrics to the putters-out in exchange of a stipulated remuneration. They are not wage earners in the stricter sense of the term. They do not sell their labour-power and are free to decide on the utilisation of their own labour-time. The system of putting out yam by the silk merchants to the weavers is also quite common in the weaving centres. A large number of the society-attached weavers are found to have been working with the silk merchants, too (Banerjee, 1995).

Thus, bulk of the yam produced in West Bengal are being purchased by the societies and the silk merchants. There are several routes that the yam follows from the reelers to the ultimate buyers, in absence of a yam exchange market. It is found that there are 12 regular -traders—deal with all sorts of commodities and silk is one of those—in Malda town, six silk merchants in Baharampur, 15 societies, and 153 agents who regularly buy the output of yam from the 629 reeler-households surveyed in CCA, alone. When the demand for yam goes up the traders themselves often come to the villages for the deal. On the whole, it is the buying agents who visit the reeling villages almost daily

during the seasons and buy bulk of the yarn produced. They are either agents of the silk merchants, or transact business directly with the societies. It is found that the intermediaries between the producers and the ultimate buyers is relatively more in numbers in the peripheral areas than in CCA, although the reeling centres in the former are located in close proximity to the principal weaving centres in West Bengal.

According to the statutes, the societies, be it weavers' cooperative or other institutions, registered with the KVIC, or the KVIB, are not supposed to buy yarn from outside. They should purchase cocoons and reel those with hired labourer in their own reeling units. However, we have only been able to find the rule as an exception. Most of the societies purchase yarn from outside and that also on credit, for a term, which is normally not less than six months.

The common reelers usually sell the daily output of yarn in small batches. They do not find it worth to travel a long distance to Malda or Baharampur or other relatively developed silk trading centres such as Panchgram and Nagar in Murshidabad, with the small volume of yarn. Also, they prefer to sell in-cash although the sale on-credit may fetch Rs 15-20 higher. The predominance of the small reelers provides sustenance to quite a considerable number of local agents. The middleman/trader takes the yarn to the big traders in Malda town and Baharampur, to the silk merchants, and/or to the middlemen/traders in the weaving centres. The relatively big middleman/trader also carries the yarn to weaving centres outside West Bengal. It is found that the bulk of the yarns exported to other states are going to Benaras, Mobarakpur (Uttar Pradesh) and Bhagalpur (Bihar)—the list of importers that we have been able to collect shows that all of them are Muslims. On the other hand, the major yarn exporters from CCA are found to be Muslims indicating relation-based market.

The quality of yarn produced by the reelers are of different *standards*, and, hence. have different use value as well as exchange values at the different weaving centres in the state and outside. Incidentally, each of the silk weaving centres has specialised in a particular type, pattern and design of silk goods. Notwithstanding, in many of the weaving centres there is a common demand for average quality yarn for the purpose of weaving scarves, etc. Thus, in particular, the direction of inland trade of silk yarn, to a large extent, is determined by the *supply* of particular quality of yarn by particular locations, and the demand for that yarn in the particular weaving centres.

The fluctuations in the world market as well as in the Indian market have differential impact upon the weaving centres, which, in tum, destabilises the production of yam and the exchange of those in the different reeling centres, at varying degrees. But this phenomenon does not adequately explain why the same quality yam fetches different prices at different locations.

The big traders in Malda town and Baharampur, in particular, do purchase directly from the reelers, in cash. However, they charge certain percentage of deductions in the form of *dhalta*, *Jhukti*, and *dalali*. Usually, the rate of discount as dhalta and jhukti is fixed at 10 grams per kilo of yam, and as dalali Rs 27.50 per kilo. According to these traders, the latter is a deduction, which they have to pay at the time of selling the yam to Benaras (in Uttar Pradesh), or in other weaving centres. However, the reelers who directly take their yam to the weaving centres do not experience such kinds of deductions, there.

In particular, the weft yam produced, for instance, in Gayesbari (Kaliachak) have a potential market in Mobarakpur (Uttar Pradesh). Likewise, the warp yam of Sershahi finds ready market in Benaras (Uttar Pradesh) and Basoa-Bishnupur (Birbhum). Of course, this does not mean that all of the reelers could share the opportunity equally.

Weft may be, but warp yam are usually not transacted in cash. This is partly because of certain technical features of weaving. Usually the warping of 10-15 cloths of *standard* lengths is done at a time. On the other hand, weft yam is more like 'working capital'. As a result, a large amount of capital, on account of warp yam, remained blocked for a considerable period of time. Consequently, the societies and other putters-out prefer to pay for the yam after the cloth is sold. Moreover, the domestic production of warp being only a small part of the aggregate requirement, in the state, it has certain marketing disadvantage *vis-a-vis* the imported warp. And, pushing the yam on-credit, by the local traders, is an entry mechanism in the market.

When the transaction costs of enforcing contract are high and there is uncertainty in futures contracts there will be a natural tendency tc spot transaction by the trader. But, if the futures contracts are legally weak, that is, if negotiation was still possible at the level below the contract made earlier, then spot transaction is not an optimum choice even if forward contract is uncertain (in the sense of lack of complete information). The trading capital capitalises on that and enters into short-term rather than long-term contracts, in the putting out

system. Unlike a capitalist firm whose size is determined by technology given the price of the product produced, the putting out system is one of the factors limiting the size of non-capitalist household organisation. The corollary is that trading capital prefers to make contracts with numerous small organisations (this has been explicated earlier also with silk weaving in Banerjee 1995). The emergence, existence and growth of 'independent' household organisations are conditional upon this institutional configuration.

7 Peripheral areas—the dynamics missing

Reeling and rearing done in the same household

There are many places where reeling of owned cocoons is a traditional economic activity. 'Why you reel instead of selling the cocoons?' The most common answer to the question is 'our forefathers used to do it, it is our family tradition'. In this case the vertical integration of rearing and reeling is not explained as a hedge against the imperfect market. Perhaps in the beginning it was so but later it assumed the shape of a family occupation. In the PA, most of the rearers are ignorant of the current prices of cocoons. They do not consider the 'information' in this respect as vital. Many of them even do not keep account of their cocoon yield rates. They associate themselves more with *rearing* than with *reeling*. Mulberry cultivation and increased volume of silkworm rearing get priority in investment decisions. Reeling is a secondary occupation, and almost all of them use katghai to process the cocoons. Why reeling failed to be considered as the primary occupation? What impeded these households to adopt the improved technology of reeling?

A typical income-expenditure account in reeling reveals that the *balance* of income *net* of expenditure depends upon the prices at which the cocoons are purchased, and the corresponding yarn prices. To those who only reel their own outputs of cocoons, the cocoon price seems to be immaterial. However, since the *trend* price of yarn forms the basis of the 'expected' price of cocoons, the *margin* between the market prices of yarn and cocoons indicates the relative profitability of reeling. The processing of 40 kilos of cocoons requires six full-time labours. To the extent the family labour is employed, the gross-return to the household proportionately increases. If, however, the yarn price dips to a level whereby the rearer-reeler could not even recover the *imputed* wage-cost of the family labour it amounts to self-exploitation.

The value-added in the reeling of weft yarn of Nistari cocoons is low. Moreover, the fluctuation in net income from the latter type of reeling is high as revealed from a comparison of the cocoon prices with the yarn prices, for a couple of days immediately after the harvest of cocoons (in Murshidabad) (Table 9).

Table 9: A comparison of input and output prices (Rs per kilo) in PA

Date	Nistari cocoons	weft yarn (sold in-cash)
17.4.93—23.4.93	35	400
24.4.93—26.4.93	32.5	325
27.4.93—03.5.93	27.5	325
04.5.93—07.5.93	25	325

The yarn price differential across locations is partly explained by the quality of yarn produced. Even the quality of the katghai-produced weft yarn varies significantly. Let us first examine the factors determining the yarn quality in PA before concluding about the price-output interface. There is a high concentration of mulberry cultivation in the Nabagram and Khargram blocks of the district of Murshidabad. Most of the rearers, instead of selling, reel yarn out of their own yield of cocoons. Moreover, most of the reelers belong to the 'marginal' category by the criterion of annual volume of reeling. Since they reel primarily their owned cocoons, the per capita volume of yarn output is low. The output of cocoons depends on the amount of silkworm seeds brushed,[10] and which, in turn, depends on the mulberry acreage as well as the size of the rearing room and other implements of rearing owned by the household. Most of the rearers by the latter criteria are small and marginal. These rearer-reelers usually sale small volume of yarn at a time and which they do not find economic to take to a distant market such as Baharampur, or Malda. The nearby silk exchange market at Panchgram, thus, attracts the reelers from the adjacent blocks. The market is organised at a roadside open space, daily for about two hours in the morning. This is the only open silk exchange place in West Bengal. The buyers usually come from the adjacent villages like Tithidanga, Bhuskul, Milky, Kutubpur, Dangapara, Kachubari, Bakipur, Chardraghat, Derul, and so on. The number of buyers, however, does not exceed 25 during the post-harvest (of cocoons) 'peak' period, which comes down to about 10 during the 'lean' period.

The average daily yarn transaction in the Panchgram market, during the peak time, is about 300 kilos. The yarn-buyers are in no way weavers and, in fact, are buying agents of the big silk-traders at Nagar, Tejhati, Baharampur (Murshidabad), or at Malda. Unlike many other places, the transactions at the Panchgram market are made in-cash, and thus attract the smaller reeler-sellers. The bulk of the yarn from this market goes to Nagar (about 15 kms away), in Murshidabad, to be sold to the big traders, however, on credit. The latter is not a unique feature of the system of purchase by the big traders at Nagar. Rather, it is found that the big traders generally do not transact business in-cash. This dissuades the small and marginal reelers, who could not afford to sale their proceeds on-credit to come to this trading post.

Let us look at the price-data collected from the Panchgram-market, immediately after the harvest of (December-January) crop of cocoons in 1992 for the katghai produced weft yarn (Table 10). The daily fluctuation in price during the 15-day period is particularly noticeable.

Table 10: Price (Rs per kilo) fluctuation at the Panchgram silk market

Date	Nistari			F_1 (NxB$_1$)			Java (PM x B$_1$)		
	Min	Max	Max-Min	Min	Max	Max-Min	Min	Max	Max-Min
29.11.92	440	450	10	455	475	20	460	475	15
2.12.92	405	410	5	410	430	20	410	430	20
3.12.92	380	400	20	405	420	15	405	420	15
4.12.92	375	400	25	400	420	20	400	420	20
5.12.92	370	390	20	400	420	20	400	420	20
6.12.92	390	410	20	420	425	5	420	430	10
9.12.92	410	430	20	430	440	10	430	440	10
10.12.92	405	425	20	430	445	15	430	445	15
11.12.92	410	440	30	440	450	10	440	450	10
12.12.92	405	425	20	430	460	30	430	460	30
13.12.92	380	405	25	400	425	25	-	-	

How the reelers react to wide price fluctuation? In most of the cases, in these peripheral areas, the rearer-reeler does not keep accounts of the cocoon-yield. Their calculations of profitability are based on the volume of yarn reeled out of 100 'disease free laying' (dfls)[11] brushed. On an average, the output of yarn per 100 dfls of Nistari, F_1 and Java silkworms, respectively, in different seasons varies between 1.25-5.5 kilos (Table 11).

Table 11: Season-wise variation in silk outputs (kilo per 100 dfls of silkworms)

Season	Nistari	F_1	Jaya
December-April	3.00	4.5	5.5
May	1.75	3.4	-
July-August	1.25	-	-

The average renditta in this region is about four. Most of the reelers are able to reel about 1.5 kilos of yarn per basin per working day, the duration of which is from 6 o'clock in the morning to 2 o'clock in the afternoon with an half-an-hour tiffin-break in-between. The wages are Rs 25 for the reeler and Rs 15 for the helper (often including food).

An estimate of the net return from 100 dfls of Nistari brushed, during the December-January season, is given in Table 12. Usual economic calculations show a *net* loss of Rs 64 for the rearer-reeler household in the PA. It is particularly interesting since during the same time, Nistari cocoons, in particular, were sold at Rs 1700-2000 per 40 kilos in CCA. In other words, if the rearer-reeler of the area had taken the cocoons to CCA he could have fetched at least Rs 500 more had he not processed the cocoons into yarn and sold these at the Panchgram market. Why the rearer-reelers in and around Panchgram still pursuing this economic activity?

We have estimated the number of person-day required for mulberry cultivation and rearing of 100 dfls of Nistari. Then multiplying that by the current wage rate in the area we arrive at the wage-costs of production of 30 kilos of Nistari cocoons, during the December '92-January '93 season (Table 12). The total labour required in the mulberry cultivation, including harvest of cocoons, are being provided by the family. The alternative employment opportunity in the hinterland of Panchgram market is poor. If the wage-costs were deducted from the aggregate costs of production, this unit yields a positive return. However, the implication of the latter is self-exploitation. If the shadow price of labour were lower than its market price the unit would have little motivation to increase its employment and expand the activity. The amount of mulberry leaves required to feed 100 dfls of silkworms generally requires 0.17 acre (or, half-a-bigha) of land. The relative profitability calculations of the household would then take into consideration the alternative uses of the particular plot of land.

Table 12: Estimate of cost - return of yarn production (out of 100 dfls of Nistari), in the periphery

A/c.	Activity	Item	Rate	Cost/ Return (Rs)
Cost of production	I. Rearing (output of cocoons=30 kilos)	1). Mulberry leaves (=560 kilos)	Rs 25 per 40 kilos	350
		2). Labour (=46 person-days)	Rs 15 per person-day	690
		3). Seed		50
		4). Formaline, etc.		20
		Sub-total		1110
	II. Reeling (output of yarn=3 kilos)	5). Fuel (=40 kilos)	Rs 2 per kilo	80
		6. Wages:		
		Reeler (two)	Rs 25 per day	50
		Turner/Helper (two)	Rs 15 per day	30
		7) Total (1)+(6)		1270
Gross return		8). Yarn (=3 kilos)	Rs 400 per kilo	1200
		9). Silkwaste (=2 kilos)	Rs 3 per kilo	6
		10) Total (8)+(9)		1206
Net return (+/-)		Item (10)-(7)		(-) 64

The reeling of weft yarn requires the following number of cocoons per thread, in this region:

Race	Number of cocoons used:	
	Minimum	Maximum
Nistari	10	18
F_1	7	12
Jaya	6	12

The labour-time required for reeling, apart from the variation in individual skills, depends on the number of cocoons used per thread at a time. More the number of cocoons taken at a time less would be the labour-time per kilo of yarn reeled. However, more number of cocoons per thread means higher *denier*, and, hence lower prices of the yarn. The reeler may chose to: (a) use less number of cocoons per thread and produce lower denier yarn, and fetch higher prices (say, P_x); or (b) use more number of cocoons per thread and thereby reduce the labour-time and fuel costs, although that tends to increasing the denier of yarn and consequently lower price (say, P_y). Then, $P_x/P_y >$ Costs of X-production/Costs of Y-production, would induce the reeler to reel X-quality yarn.

However, the actual price at which the reeler transacts is not proportional to the quality of the yarn. In PA, the quality of the weft yarn is defined by the type of the thread—triple-thread, double-thread, or single thread; single thread being the poorest of the lot. While the average production of single-thread weft yarn (using 20 to 22 cocoons at a time) per katghai, by a reeler and a turner, per day is 1.5 kilos, the output of the double-thread yarn (finer than single-thread), using 10-11 cocoons at a time, does not exceed 800 grams. In other words, the cost of production of the double-thread yarn is about 2-times more than that of the single-thread yarn. Notwithstanding, the price of the double-thread weft yarn is only Rs 20-25 higher than that of the single-thread yarn.

The typical rearer-reeler in the hinterland of the Panchgram market adjusts production-mix on the basis of the floor price of yarn. This is a vicious circle. They produce poorer quality of yarn and fetch relatively low price, and since they are able to negotiate only at a lower price compared to that say, in the CCA, they have no inducement to go in for improved processes of production. The variation in yarn price in CCA and in the periphery is revealing

(Table 13).

Table 13: Prices (Rs per kilo) of Nistari-weft yam in PA and CCA compared

Date	CCA		PA (at Nabagram)	
	Min	Max	Min	Max
29.12.92	500	590	440	450
2.12.92	550	650	405	410
3.12.92	550	600	380	400
4.12.92	500	625	375	400
5.12.92	510	575	370	390
6.12.92	560	590	390	410
9.12.92	510	625	410	430
10.12.92	600	650	405	425
11.12.92	550	580	410	440
12.12.92	515	600	410	430

The incentive structure of the output market induces use of child labour in reeling. Almost all of the turner-cum-helpers, in the PA (Nabagram-Khargram area), are invariably the easily available child labour—either family-member or hired. This enables the owner to reduce the cost on that account by about 50 per cent as compared to the wage costs in CCA. The reelers also have no incentive to own a katghai or replace katghai by costly IC. In Sankoghat (in PA), there are 43 rearer households and none of them sells cocoons, whereas the number of households those who own katghai is only 12. In Alinagar (another PA village), similarly, only 23 households own katghai out of the 93 rearer households. In other words, the *surplus* generated, if any, in the process of yarn production is not ploughed back. They rather allocate resources in expanding rearing.

In rearing, the pattern of resource utilisation favours Nistari—the traditional variety—rather than HYV silkworms. The size of mulberry plantation remaining the same, the number of HYV silkworms that could be reared is less than Nistari. While about 500 kilos of mulberry leaves are required to rear 100 dfls of pure Nistari (commercial) the requirement of leaves for the same number of hybrid Bivoltine is about 600 kilos, and for pure Bivoltine about 850 kilos. In other words, on account of leaves alone, the costs of rearing increase by 20 and 70 per cent, respectively, for hybrid B_1 and Pure B_i, over that of Nistari. Moreover, as compared to Nistari the HYV rearing requires a different kind of human-embodied technology. The knowledge of Nistari rearing has been

transmitted through generations in the family, rendering it less prone to risk. On the other hand, the HYV cultivation—an 'alien' knowledge—enhances nsk. In brief, it has a high *mean* of outputs, and is associated with a high *coefficient of variation*. Yet, so far as the incentive structure is concerned, the increased costs of rearing *plus* the risks in the rearing of HYV cocoons notwithstanding the yarn obtained from HYV fetches a price marginally higher than Nistari-yarn (Table 10).

In the December-January and March-April seasons, some of the households rear HYV silkworms, in the areas adjacent to Panchgram market. These seasons are particularly favourable to HYV silkworm rearing in West Bengal. Yet, the rearers prefer a product-mix of Nistari and HYV. Out of the 124 rearer-reeler households surveyed, 54 brushed Nistari only during December-January and March-April, 25 brushed HYV (Bivoltine) only, and 45 preferred to have a crop-mix of Nistari and F_1 or Jaya (Table 14). In Sankoghat, however, the rearers are rather forced not to have Nistari by the government agencies supplying the 'seeds'. Out of those who reared a mix of silkworms, the proportion of HYV to aggregate volume of rearing generally does not exceed 50 per cent.

Table 14: Composition of silkworm outputs in Panchgram market adjacent areas (Dec-April seasons)

Village	Block	No. of rearer *cum* reeler households surveyed	Distribution of households according to the variety of silkworms reared		
			Nistari	Nistan *plus* HYV	HYV
Balaspur	Nabagram	51	32	19	-
Sankoghat	-ditto-	19	-	8	11
Alinagar	Khargram	16	7	9	-
Tailpara	Nalhati-I	8	7	1	-
Gopalchak	Nalhati-II	30	8	8	14
Total		124	54	44	25

Further, for the rearer-reelers, in PA, reeling provides 4-5 days of full-time employment, on an average, per season, and 15-16 days a year, while that is much longer in rearing. Unlike in CCA, these people somehow do not find it worth to gather cocoons from the market and produce yarn at a commercial scale. They reallocate resources in the extension of rearing. The

mode of participation of the basically peasant households in the process of silk production is particularly intriguing. They could have sold out the cocoons. Instead, they undertake entrepreneurial risk, unlike a typical peasant. However, the enterprise ultimately fails to transform into an 'establishment'.

The phenomenon is not location specific although may acquire different shape depending on the market-reeler interface and the specific socio-economic conditions of silk production in particular locations. Let us look at the conditions of production in Majhyampur village—another PA—in Beldanga-I block in the district of Murshidabad. The yarn of Majhyampur is mainly sold at the weaving centres like Basoa-Bishnupur (90 kilometres away), Nagar (50 kms), and Chak-Islampur (40 kms), and only a negligible part goes to the Panchgram market. The market, thus, has little influence on operational restructuring in Majhyampur.

Of the 30 sericulture households, in Majhyampur, only 13 have Katghais. The rest get their cocoons reeled out of the neighbour's katghai. Those who have their own reeling units buy cocoons, in addition to their own, from other sources and reel those. Usually they buy the cocoons, on-credit, from other parts of Murshidabad, Birbhum and the district of Nadia. In order to secure the supply of cocoons they have to pay Rs 50-100 more per batch of 40 kilos than the average current prices. The purchase is made through local intermediaries who charge a commission not less than Rs 10 per 40 kilos. The local intermediary, in fact, acts as the 'guarantor' in the transaction. The payments for the cocoons are made out of the sale proceeds of the yarn.

The type of weft yarn produced in the village caters specifically to the demand from the nearby weaving centres such as Nagar, Basoa-Bishnupur, and Chak-Islampur, in particular. The weavers in these centres put demand for the double-thread yarn, which is produced with 12-13 cocoons per thread, as weft. And the reelers of Majhyampur have streamlined their production accordingly. The quality of the yarn of Majhyampur being better than that of Nabagram-Khargram area fetches a higher price. However, the costs of reeling the double-thread yarn are almost double the costs of reeling single-thread yarn, given the working-hours and the wage rates of the hired labour. Moreover, unlike in Nabagram-Khargram, the owner in Majhyampur employs an extra labour as helper at Rs 28 per day, which is much higher than that being offered to a turner. They are basically employed for slub clearing.[12] Evenness,

cleanness and neatness of the yam determine the weaving quality of fabric. The employment of a person specifically to ensure evenness and cleanness of the yam clearly shows attempt on the part of the reelers of Majhyampur to produce better quality fabrics in katghai.

The artisans in Majhyampur, unlike their counterparts in Nabagram-Khargram region, although have alternative vents for the output they are equally affected by the 'irregular' price fluctuation and are not properly compensated despite their best efforts. Majhyampur is one of the oldest regions where silk production has been a traditional craft. According to the reelers in the village, there were a number of reeling machines almost like the modern Cottage Basin, as early as in the 1920s. Extensive use of steam from boiler for the purpose of 'heating' was the characteristic feature of the technology. The boiling of cocoons was used to be done separately. However, the 'backward' katghai technology steadily replaced the Cottage Basin over time. One of the katghai units was set up in 1943, which is by now the oldest operating unit. Another was installed in 1958 and still is in-operation, out of the 17 units (all katghai) operating in Majhyampur. The age of the units varies between 3-15 years, excepting a few. Most of the reeler households belong to small and marginal groups, going by the distribution of the operational landholdings.

The two sample households in Majhyampur who installed the reeling units in 1993 and 1958, respectively, amply illustrate that export potential alone could not ensure upward mobility of the producer. Sixty-year old Hasan Ali Sheikh is head of an 8-member family living in a *kaccha*-house. He owns altogether 1.67 acres of land including 0.11 acre of homestead land, of which 0.83 acre is irrigated by shallow tubewells. However, only 0.50 acre of unirrigated lands is under mulberry cultivation. The two-katghai units those were still in-operation in 1993 were installed in 1943. During the last five years about, Hasan Sheikh used to reel on an average, 500 kilos of weft yam per annum with hired workers in addition to his and son's labour. Although reeling is the primary occupation it could not keep the household engaged for more than six months in a calendar year, and that too is less than full-time job equivalent. The proportion of owned cocoons to the aggregate volume of reeling was only about 10 per cent, resulting in vulnerability of the unit to market fluctuations. Quite often he failed to recover the costs of production, particularly when he had bought cocoons from outside, due to abrupt fall in yam price. The result is perpetual indebtedness to private moneylenders. His outstanding borrowing

from the private moneylender, in July 1993, was Rs 8,000 with collateral security of 30 grams of gold ornaments; at 3 per cent interest rate per month.

The story of 59-year old Ali Akbar Sheikh, head of a family of two members, of the same village, who installed two katghai units in 1958, is not much different. He owns altogether one acre of land. Of these. only 0.25 acre is under mulberry plantation, that too, unirrigated. He reels about 180 kilos of weft yarn per annum with hired workers, in addition to his own labour. His owned cocoons constituted about 5 per cent of the aggregate volume of reeling per season. His outstanding borrowing from the private moneylender. in July 1993, was Rs 1,200 against the mortgage of gold ornaments at a monthly interest rate of 3 per cent.

In general, the loss-absorption capacity of a rearer-reeler is greater than that of an exclusive reeler. The use of family labour in the rearing and harvesting of cocoons provides a safe cushion to the rearer-reeler against the hazards of the market. Those who buy cocoons, on the other hand, from external sources are relatively more affected by price fluctuation. Those who buy cocoons on-credit are subjected to additional uncertainty and risk. Hence, the smaller reelers, though otherwise would have been economic, generally do not buy large amount of cocoons in one batch. In turn, the diffusion of improved technology has been slow. A 3-basin, or a 5-basin IC not only requires much larger initial investments, it is also unprofitable unless the capacity utilisation is high. On the other hand, katghai turns out to be an *appropriate* technology for the average reeler who works with small inventory.

Reeling as a distinct activity. in PA

Raghunathganj block has a rich tradition of reeling and weaving. Even by the turn of the century there were two boiler-steam running reeling machines. Those two units, however, ceased operation in 1948. Numerous katghai units also were in-operation. Mirjapur village in Raghunathganj-I under Jangipur sub-division of the district of Murshidabad is famous for its designed *saris*. The traditional *Murshidabad silk* is usually printed while the designs are woven in the saree, in Mirjapur. The popular among them are known as 'design satin', 'plain satin', 'Jamdani' and 'Korial'. Of the 1171 households in Mirjapur (including the two adjacent villages, viz., Amgachhi, and Bijoypur), there are 300 weaver households. Each household operates, on an average, two handlooms. The average number of working-days per month is 29, and the labour-hour per day

is not less than nine hours, which normally begins at 6 O'clock in the morning and continues till daylight are available (normally, 6 O'clock in the evening) with normal breaks for tiffin, meal, etc. In other words, the looms remain sufficiently engaged.

On an average, 2.23 kilos of yarn are woven in a loom per month. Thus, the estimated monthly aggregate demand for yarn in Mirjapur is about 1,350 kilos. Of these, the warp yarn requirement is roughly 550 kilos, and the rest for weft. Almost the entire requirements of warp are imported from Bangalore (Karnataka). And most of the weft yarn required is produced locally in the Jangipur sub-division. The weavers work largely under silk-merchants in a putting-out system of production. Some are members of either of the two (weavers') cooperative societies. A few of them work independently.

Thus, despite a relatively steady market located in close proximity, the reelers have very little direct access to the weavers. Bulk yarn buyers are the (weavers') cooperative societies and 15 silk-merchants. The silk-merchants, however, purchase yarn from both the middlemen and the reelers. The independent weavers, on the other hand, require smaller quantity of yarn at-a-time. The silk-merchant who sells yarn in retail markets, too have an advantage. Yarn bought from the local silk-merchants, instead of directly from the local reelers, widens weavers' choice of variety. Further, the weavers prefer to weave with the weft produced in CCA. However, since the latter is costlier than the weft produced in Jangipur, and the prices of saris do not compensate for the additional costs on account of higher priced yarn, the weavers are rather forced to use the yarn from Jangipur.

Hatibandha village is located at a distance of 10 kms away from Jangipur town in Raghunathganj block-II, where reeling has developed as a distinct economic activity. There are 275 households in the village. Of them, 62 have katghai and one has an IC. The extent of dependence of these households on agriculture is evident from the fact that, out of the 22 selected households, ten are landless, five own lands up to 0.33 acre, two own more than 0.33 but less than 0.66 acre, four have 2-3 acres, and one has 8.3 acres. That relatively big landowners are also engaged in reeling along with the landless households apparently points to the commercial potential of the profession. However, excepting the 3-basin IC which was installed in 1991 replacing the eight-year old katghai, and the two units which came up during the last 10 years, the average age of the reeling units is more than 10 years. Of the

22 units, eight are more than 30-year old, and 11 units came up during 1963-83. In other words, the participation of big landowners in Hatibandha is a traditional phenomenon.

A typical account of the economics of reeling in Hatibandha is not much different from that in other areas we have already examined. Only exception is that the reelers are not rearers, as well. The balance of profit and loss is crucially determined by the *difference* of the yarn and cocoon prices. For instance, some of the reelers in Hatibandha bought cocoons at the rate of Rs 1000-1100 and they were able to earn a *positive* return. Second, the ability to hold inventories of input is crucial in determining *net income*, since the supply of cocoons is seasonal. Thus, a reeler has to purchase cocoons within 10-15 days after the harvest otherwise the supply would be exhausted. The reeler also must be able to hold stock of the yarn for higher price. For instance, the (Nistari) weft yarn those were sold to the traders from Mirjapur in-cash, during May, fetched Rs 380 per kilo on 16 April '93. It dropped to Rs 315 just within 11 days. However, on the very next day, the price increased substantially and remained stable at Rs 390-425, thereafter declined to Rs 320 on 1st May '93. It further increased to Rs 430 on 8 May '93.

The inventory building of cocoons is determined by individual's entitlements to working capital. Most of the reelers sell yarn as early as possible since the sale proceeds would enable them to purchase additional cocoons within the season. The yarn is sometimes also held as asset. There are private moneylenders who often give credit against yarn as collateral asset. When the average current price of yarn is Rs 400 per kilo, the private moneylender allows borrowing of Rs 300 per kilo of yarn mortgaged, and at a 5 per cent monthly interest rate.

Almost all of the reelers had expressed their desire to switch over to IC since katghai yarn fetches lower price. But why they had not been able to? The answer was that they did not have the initial capital required to install an IC. It is evident from the profile of the 22 selected households in Hatibandha (Table 15) that reeling constitutes only a quarter of the aggregate family income, for the eight households. For another 10 households, it was between 25 and 50 per cent, and one had 60 per cent of the family income from reeling itself. Only one is found to be solely dependent on reeling although the annual volume of reeling was about 120 kilos.

able 15: Hatibandha: profile of 22 selected households (as in July 1993)

Household unit	Operational holding (acres)	No. of katghai	Year of installation	Annual vol. of reeling (kilos)	No. of adult male family member	Use of own labour in reeling	Other occupation	%-age of household income from:		
								Reeling	Agri	Others
1	-	1	1943	100	4	-	DL, MW, B	35	-	65
2	-	1	-53	160	2	-	MW, B	25	-	75
3	-	1	-52	100	4	-	-Ditto-	25	-	75
4	-	2	-53	300	3	-	-Ditto-	25	-	75
5	-	1	-83	150	3	-	-Ditto-	25	-	75
6	-	1	-78	75	2	-	DL, MW, B	25	-	75
7	-	1	-75	120	1	-	-	100	-	-
8	4 16	2	-82	180	3	-	AG	40	35	25
9	2.33	2	-53	400	4	2	AG	20	60	20
10	3.33	1 (IC)	-83/91	250	2	-	AG	loss	80	20
11	0.33	1	-75	80	3	-	AG, MW	35	10	55
12	0.08	1	-79	75	1	-	V	40	-	60
13	1.32	2	-44	175	5	-	MW, V	40	10	50
14	0.82	1	-77	60	3	2	-Ditto-	25	10	65
15	0.33	2	-68	330	3	2	AG, DL	50	20	30
16	0.50	2	-81	200	1	-	AG, PT	50	20	30
17	-	2	-58	350	3	4	DL, B	50	-	50
18	8.33	4	-53	500	7	3	AG, PT	25	55	20
19	0.17	1	-83	110	2	1	DL, B	60	5	35
20	-	1	-81	130	1	1	-Ditto-	50	-	50
21	2.66	1	-73	100	2	-	AG, MW	25	50	25
22	-	2	-88	200	1	-	DL, B	40	-	60

Notes: 1) Unit 6: 12 years old and is a contractual farm labour (*Mahindar*); Unit 17: 3 sons aged 13, 12 and 10 years, respectively are engaged in reeling, and also work as mason; Unit 20: children are also engaged in reeling, or as hired labour elsewhere.
2) Occupation—DL: daily labour; MW: masonry worker; B: bidi-making; AG: agriculture; V: vending; PT. petty-trading in fruits, etc.;
3) The figures in the last three columns are as reported by the households.
4) IC = improved charkha (3-basin).

The use of family labour in reeling is not a frequent phenomenon in Hatibandha. Most of them work as masonry labour, and, during the period of frictional unemployment they take up bidi-making as principal occupation. Though reeling is done largely with hired labour, they do not keep themselves totally abstained from the activity. Early in the morning they put fire to the katghai-oven and reel some amount of yarn before the hired workers join the work. One of the households is found to be employing hired workers for reeling in his 3-katghai unit while the head of the household gets employed elsewhere as daily labour. His annual volume of reeling is as high as 200 kilos. Yet, income from yarn constitutes only 40 per cent of the aggregate family income. An equal amount is earned as daily labour. The remaining 20 per cent are earned from bidi-making. The oldest (installed in 1943) of the reeling units is a katghai and owned by a basically landless and mason (Table 15). Although there are four adult males in the family of eight members none of them is engaged in reeling. Notwithstanding, the annual volume of yarn production is about 100 kilos fetching Rs 40,000 as annual gross sales revenue. About 65 per cent of the aggregate income of the family constitute wage-income in agriculture, or as masonry worker. Bidi-making constitutes about 10-20 per cent of the aggregate family income of these households (Table 15) and provides opportunities to utilise the 'free' labour-time. Another factor reflecting the poor economic conditions of these reelers is the high participation rate of child family labour in productive activities while the women—particularly in this village, mostly Muslims—are not supposed to work either in reeling unit, or outside.

Excepting one household (Unit 10, Table 15) who owned a katghai since 1983 and replaced that with a 3-basin IC in 1991, the reelers generally must not have found it economic to switch over to IC, or perhaps they did not have enough initial capital to invest. Incidentally, the household who installed the IC had been able to do so only with a loan of Rs 50,000 from the West Bengal Finance Corporation (WBFC). However, the unit did not earn a profit till July 1993.

The large holding of about 8.33 acres including four acres irrigated land. of a particular household who is otherwise a reeler may be a distinguishing feature in this perspective. Yet, the economic behaviour of the household does not show much variation from other households. This particular household owns four katghais. Two of which were installed as early as in 1953. Of the 23

members of the household, seven are adult males. Yet, only two of them are engaged in reeling, one of the children is engaged as turner, and hired labourers in the four katghais do rest of the job. This household does not have resources crunch that inhibits the adoption of IC. Moreover, the household had been able to secure a loan of Rs 9,000 of which Rs 3,000 was worked out to be the subsidy under the District Rural Development Agency (DRDA) scheme.

In brief, in Hatibandha, although reeling has emerged as a distinct economic activity the social division of labour still remains opaque. The opacity of the forms of labour is partly due to the uncertainty and risks arising out of the market conditions of both the yam and cocoons. In a village of 275 households, only 82 are having agricultural lands of varying sizes (Table 16). And, largely because of the traditionality of the reeling activity, many of the landless households even took up reeling as just an alternative source of income. But instead of keeping themselves engaged in the unstable and short-term employment, in reeling, they prefer to work under labour-contractors as mason that provides employment for a relatively longer period.

Table 16: Hatibandha: distribution of households according to land ownership

Size of ownership holding (*bigha*)	No. of households
up to 3	40
3 - 6	10
6 - 9	10
9 - 12	7
12 - 15	4
15 - 20	5
20 - 25	4
25 - 35	2

The daily wage in reeling for the highest paid job, i.e., for the reeler, is Rs 30 for a nine-hour labour. In comparison, for the same duration of work in masonry jobs the wage is as high as Rs 40-50. Even a helper to a mason earns Rs 30. In agriculture, during the peak seasons, the wage rises to Rs 30, for a nine-hour work, in addition to tiffin. As compared to the conditions of labour in reeling, like that for a continuous work in front of a fireplace, in smoke, and all that, agricultural work is rather considered 'comfortable'. As it seems the differentiation among the job seekers on daily-wage depends on the chance

factor: 'who gets what'. Those who find job in agricultural activities may consider themselves as privileged. Quite often the hired reelers are aged people displaced from agricultural work or hard manual labour market.

The division of labour is supposed to be the precondition for accelerated growth of economic surplus. What we find in Hatibandha, however, is that the reeler-households are no longer entrepreneurs. Rather their entrepreneurial role is subsumed by their preoccupation with daily labour for wages. Their motivation towards reeling extends up to the point where they could earn subsistence. They do not differentiate the income as entrepreneur from that as wage-labourer. Their decision to allocate own-labour in alternative economic activities is primarily guided by comparative wages—the typical behaviour of a wage earner alienated from means of production. However, these reeler households do organise cocoon buying, do reel some amount of yarn before the hired workers turn up in the morning, sell the yarn, and above all manage a financial portfolio. This convergence of entrepreneurial activities and wage behaviour typically characterises the informal sector in the PA.

8 Central commercial area (CCA)—the transition stunted

The wage rate-cost of capital ratio is generally considered as guiding the capital-labour ratio or technology. Following the wage rates in reeling (Table 17), villages such as Alipur, Sershahi, Marupur, and Mozampur in CCA can be distinctly differentiated from Khaltipur, Choto Sujapur and Bakharpur. However, what is puzzling is that, according to the technology use Alipur, Sershahi, Marupur, and Mozampur, despite comparatively lower wage rate, are dominated by ICs. While Khaltipur, Choto Sujapur, and Bakharpur with higher wage rate are practically katghai-user areas (Table 6). This prompts us to inquire into other fundamental relations neglected in the neoclassical development economics.

Table 17: Locational variation in wage (Rs) per hour in different activities (as in 1993)

Block	Village	Reeling			Agriculture	Brick-field	Silkworm rearing	*Bidi* binding
		Reeler	Turner	Helper				
Kaliachak (CCA)	Alipur	2.30	2.47	1.13	4.50	-	2.50	2.25
	Sershahi	2.30	2.47	1.13	4.50	-	2.50	2.25
	Marupur	2.30	2.47	1.13	4.50	-	2.50	2.25
	Mozampur	2.30	2.47	1.13	4.50	-	2.50	2.25
	Khaltipur	2.70	2.70	-	4.50	4.37	2.91	-
	Choto Sujapur	2.94	2.94	-	4.50	-	2.91	-
	Bakharpur	3.12	3.12	-	4.50	-	3.33	-
Beldanga-I	Majhyampur	2.50	1.41	2.08	3.33	4.37	-	-
Khargram	Alinagar	3.33	2.08	-	3.33	-	-	-
Nabagram	Sankoghat	3.33	2.08	-	3.33	-	-	-

Note: Since working hours vary across regions as well as economic activities, we reduce the wage to 'per hour rate'.

The duration of reeling, or the number of working days per annum, varies across the production centres. This is, however, not related to the specific technology-in-use. For instance, on an average, the reeling unit in Alipur which is predominantly an IC-using area, remained active for 144 days in a year whereas the same was 143 days in Choto Sujapur known for its overwhelming dependence on katghai (Table 18). Similarly, it is very difficult to distinguish between Marupur and Khaltipur, in that respect, although the reeling technology used in these two places is different.

Table 18: CCA: average duration of reeling and type of yam reeled per annum in different clusters

Village cluster	Average no. of days of reeling per annum	Production of warp (%)	Production of weft (%)
Alipur	144	64	26
Sershahi	121	66	34
Marupur	95	51	49
Mozampur	126	2	98
Khaltipur	96	3	97
Gayesbari	90	24	76
Choto Sujapur	143	4	96
Bakharpur	125	3	97

The locational variation of the kind of yarn being reeled in the villages in CCA is significant. For instance, about 64 per cent of the aggregate yarn produced, in a season, was warp in Alipur while warp yarn production constituted only 3 per cent of the aggregate output in Bakharpur, or 4 per cent in Choto Sujapur (Table 19). This regional specialisation within the CCA and where the (selected) villages are located within a radius of not more than 10 kilometres from the Kaliachak market place draws particular attention.

Table 19: CCA: Production of yarn (kilos per 40 kilos of green cocoons)

Village cluster	Type of yarn	Nistari cocoons			F_1 cocoons		
		Exclusive reeler	Rearer *cum* reeler		Exclusive reeler	Rearer *cum* reeler	
			Using hired labour	Using own labour		Using hired labour	Using own labour
Alipur	T	-	3.000	3.000	3.625	3.400	3.500
	V	3.625	3.410	3.500	-	3.820	4.000
Sershahi	T	3.250	3.000	3.000	3.430	3.390	3.500
	V	3.375	3.380	3.500	3.750	3.710	4.000
Marupur	T	-	3.160	-	3.440	3.430	3.500
	V	3.580	3.450	3.430	-	3.800	3.700
Mozampur	T	-	-	-	3.750	3.870	-
	V	3.410	3.220	3.380	3.850	3.700	3.840
Khaltipur	T	-	2.875	-	-	3.375	-
	V	3.490	3.370	3.350	4.000	3.860	4.000
Gayesban	T	2.900	2.810	-	3.500	3.460	-
	V	3.210	3.100	3.280	3.750	3.670	3.750
Choto Sujapur	T	-	-	-	-	3.125	-
	V	3.170	3.100	3.225	3.900	3.800	-
Bakharpur	T	-	2.875	-	-	3.700	-
	V	3.250	2.970	3.050	3.750	3.850	4.125

Notes: T = *Tana* (warp yarn); V = *Varna* (weft yarn).

We could make further distinctions among the weft yarn producing villages as regards the quality of the yarn. By dint of having large numbers of ICs the weft yarn produced in Marupur and Mozampur are of superior quality.

However. with the primitive Katghais the reelers in Gayesbari, Sujapur and Bakharpur produce weft, which are comparable to and sometimes even better than that of Marupur and Mozampur. On the other hand, although there is a large number of ICs in Khaltipur the village is known for its low quality weft. It is thus very difficult to generalise the production performance the technology adopted at the grassroots level.

The recent trend in adoption of ICs in CCA is noteworthy. It would be interesting to study the growth potential of the newly set up IC units and the older units those who have switched over to improved technology. The range of production across the units is found to be 4-2100 kilos. As functional categories, let us classify the reeling units accordingly as annual production (a) not more than 600 kilos, (b) between 600 and 1200 kilos, and (c) more than 1200 kilos, as small. medium and large scale units, respectively. Out of the total 679 sample reeling units, 644 are small, 24 are medium and only 11 are large scale units, in CCA (Table 5). The annual turnover, for an average quality yam at Rs 600 per kilo, of the large units varies between Rs 0.72 and 1.1 million, and that of a small unit does not exceed Rs 0.36 million. Of the 644 small scale units, in CCA, 271 are Katghais and 379 ICs. The oldest among these is in Alipur and was installed about 70-90 years ago. Interestingly, altogether 63 units are more than 20 years old and have still not been able to increase the annual output above 600 kilos, showing restricted vertical mobility.

None of the larger units, however, was set up before 1953. Nine, out of the total 11 large units were set up during 1980-81 to 1992-93. The oldest of the large sized working units is a katghai unit that was set up in the 1950s. There are two more katghai units whose annual production exceeds 1200 kilos. Further, of the 11 large units only two are found to be exclusively producing warp yam. And, most of the remaining units show faster swing to reeling weft instead of warp. The latter units are mostly located in Mozampur and Gayesbari (primarily, weft producing villages) and none in Choto Sujapur and Bakharpur.

There are altogether 24 medium scale units in CCA. Of these, five only are katghais and 19 are ICs. The oldest of the units—a katghai installed in the 1940s—is located in Khaltipur. Most of the medium units were set up during the last eight years; specifically, eight units are only four to eight years old (Table 20).

The age-composition of the small scale units shows that 29 per cent started operation in 1992, another 20 per cent are 1-2 years old, and 17 per

Table 20: Age distribution of the reeling units, in CCA (as in March-April 1993)

Village	Type of unit	<1 year	1-2	2-4	4-8	8-12	12-16	16-20	20-30	30-40	40-50	50-70	70-90 years
Alipur	K	-	-	1	-	-	1	1	-	-	-	-	-
	IC	20	10	12	9	3	3	2	4	2	-	1	1
Sershahi	K	-	-	-	-	-	-	-	-	1	-	-	-
	IC	61	30	23	12	6	1	2	2	-	1	-	-
Marupur	K	-	-	-	-	-	-	-	-	1	-	-	-
	IC	22	10	9	8	1	-	-	-	-	-	-	-
Mozampur	K	-	-	-	-	1	-	-	-	-	-	-	-
	IC	16	13	14	15	7	2	7	6	-	3	-	-
Khaltipur	K	17	33	18	18	8	2	5	18	6	7	1	-
	IC	9	18	9	4	2	-	2	2	1	-	-	-
Gayesbari	K	18	5	4	6	7	3	1	-	-	-	-	-
	IC	3	-	3	3	2	-	-	1	-	-	-	-
Choto Sujapur	K	8	4	10	7	7	2	1	1	2	2	2	-
	IC	-	-	-	-	-	-	-	-	1	-	-	-
Bakharpur	K	16	8	11	4	4	2	1	2	1	1	-	-
	IC	-	-	-	-	-	2	-	-	-	-	-	-
Total		190	131	114	86	48	18	22	36	15	14	4	1
	K	59	50	44	35	27	10	9	21	11	10	3	-
	IC	131	81	70	51	21	8	13	15	4	4	1	1

Notes: K=katghai; IC=Improved charkha; Total number of K=279 and IC=400

cent are 2-4 years old. Another 25 per cent units belong to the age group of more than four but less than 20 years. Thus, altogether about 91 per cent of the small scale units came up within the last 20 years (as in 1993). However, the age of the industry itself in CCA is much longer and there were quite a large number of units. In other words, a large number of older units seem to have closed down over the years. Despite high mortality rate most of the units established during the last eight years are ICs (Table 20). It was the demand for warp that induced new investments in ICs.

The volume of cocoons (by weight) required to produce one kilo of raw silk (called *Renditta*) indicate input-productivity. In almost all of the cases the productivity of the units using family labour is highest, and that of the rearer-reelers who employ hired labour in reeling is lowest among the three groups of reeler households, in CCA (Table 19). In fact, the household units could, by self-exploitation, produce more per day per basin.

The division of labour between rearing and reeling is relatively prominent in CCA (Table 21). Most of the rearers have not engaged themselves in reeling.

Table 21: The number of rearer and reeler households in the CCA

Village cluster	Total no. of households	Total no. of sericulture households	No. of reeler households
Alipur	1000	1000	73
Sershahi	-	-	-
Marupur	-	-	-
Mozampur	1000	800	84
Khaltipur	600	550	310
Gayesbari	1500	1350	145
Choto Sujapur	1200	1200	140
Bakharpur	4800	3600	100

This zone bears resemblance to features of commercial development which, in most part, are non-existent in the PA. The factors that distinguish CCA from PA are, first, the significant diffusion of IC even among the small reelers. Although there is a recent spurt in installing IC particularly in Sershahi, Alipur, Marupur and Mozampur, the history of these units dates back to as early as in the 1920s. Interestingly, the medium and large scale units are relatively younger when compared to the age of the small units. Of the 373 IC units owned by the small reelers in CCA, 41 were installed before the year 1980. There are 19 IC

medium units, and eight large units. Of these, seven in the former group and eight in the latter were set up before 1980. In other words, of the total 56 IC units installed before 1980, only 15 had been able to produce more than 600 kilos per annum. Second, the average volume of reeling per annum in CCA. as a whole, is much higher as compared to most of the other centres. More than 65 per cent of the 629 units in CCA have annual production exceeding 100 kilos. Of this, about 35 per cent have annual output exceeding 500 kilos. Third. the quality of yam in CCA, be it weft or warp, is generally better than that of the other reeling centres, and hence the products usually fetch comparatively higher prices. Fourth, in CCA, although sericulture is the major economic activity the reeler to rearer ratio is quite low, except in Khaltipur (Table 22). While in clusters like Alipur and Choto Sujapur all of the households are engaged in sericulture the rate of participation in places like Khaltipur. Gayesbari, Bakharpur varies between 75-90 per cent. Finally, the use of family labour in the household enterprises is negligible, irrespective of the size of the unit.

Table 22: Kaliachak: number of sericulture households and reeling units

uster	Total no. of households	Number of sericulture households	Total no. of reeling units	Improved charkha	katghai
Alipur	1272	1272	73	70	3
Mozampur	1000	-	84	83	1
Khaltipur	600	550	310	60	250
Gayesbari	1500	1350	145	53	92
Choto Sujapur	1200	1200	140	15	125
Bakharpur	4800	3600	100	0	100

The intra-regional variation of technology in-use is clearly evident. While there is only one katghai unit each in Sershahi, Marupur and Mozampur there is only one IC unit each in Choto Sujapur and Bakharpur. Alipur also has a distinctive bias for IC; three out of 70 reeling units are found to be Katghais. The CCA, in fact, is divided into warp-yam and weft-yam producing regions with necessary implications for wages, exchange of output, and the entry conditions.

The marketability of yam produced in different villages varies. If an entrepreneur set up a katghai unit at Sershahi and produce weft yam, in all

probability, he is bound to land-up in losses because of low demand for that yarn. It is therefore almost axiomatic that whoever ventures into the field, in, say, Sershahi, should be able to invest at least Rs 15,000-20,000 on capital equipment alone. Alipur, Sershahi and Marupur where IC predominates reeling have specialised in warp yarn production. On the other hand, Khaltipur, Gayesbari, Choto Sujapur and Bakharpur are predominantly weft yarn reeling centres, and are found to have very high concentration of katghai. Mozampur is exceptional in the sense that although almost all of the units have installed IC, there they have specialised in weft yarn production.

This is perhaps explained by production externalities. An externality represents a direct, physical link between the production functions of two or more agents. The activities of one may impose costs or confer benefits upon another. The agents have to take into private account the external (or social) impact of their production decisions. In fact, in a particular village or cluster of villages, there exists a social production curve instead of private production curves. An attempt to change the 'social' product or process technology is most likely to land up in negative divergence between private marginal cost (MC'_x) and social marginal cost (MSC_x). As a result, the level of production of the agent (X_0) would be less than socially optimum (X_1) (Figure I). The social effect of their behaviour is thereby internalised. Such externalities constitute one source of market failure.

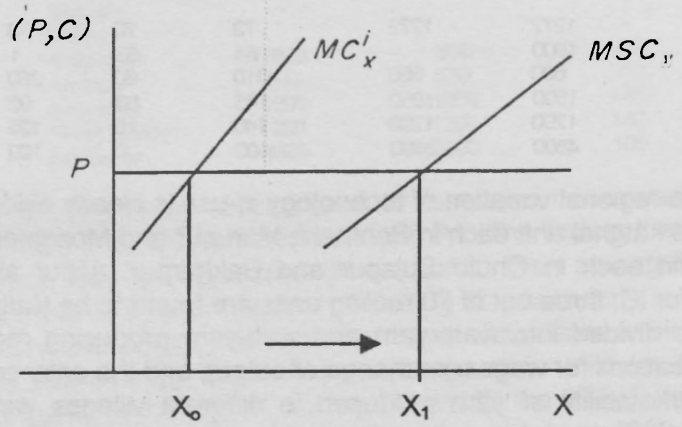

Figure 1

Table 23 shows that, in terms of the annual average output per rearer-reeler household employing hired labour, the basically warp yarn producing areas could not be distinguished much from the basically weft producing areas. For instance, while Alipur produces warp and weft in the ratio of 64:26. and its average per capita output is 270 kilos, the same is 263 kilos in Choto Sujapur although the warp-weft ratio is 4:96. However, the variation in the annual volume of output of the 'exclusive reelers' is significant across clusters. Excepting Bakharpur, the relatively low yield areas are usually those where higher proportion of warp yarn is produced.

The size of operation of the average exclusive reeler is larger than that of the average rearer-reeler. Further, among the rearer-reelers, those who employ hired labour usually operate at a higher scale than those who do engage family labour. This is partly explained by the 'free' family labour-time available after the household allocates labour in reaning. Rearing and reeling are not simultaneous operations, yet land curing and development require great deal of labour for the senculture households, during the post-harvest period. The size of operation is also determined by the stock of cocoons. In brief. the *net* outcome is explained by (a) the entitlement to working capital that determines the volume of inventory that any individual reeling unit could hold,

Table 23: CCA: Average annual yarn turnover (kilos) per household, by type of organisation

Village cluster	Rearer *cum* reeler		Exclusive reeler
	Using hired labour	Using own labour	Using hired labour
Alipur	270	221	302
Sershahi	257	139	301
Marupur	219	74	301
Mozampur	284	119	488
Khaltipur	183	101	350
Gayesbari	209	71	650
Choto Sujapur	263	73	423
Bakharpur	136	47	200

and (b) the portfolio management. The decision to reallocate labour is less complicated to an exclusive reeler than it is to the rearer-reeler who has to take into consideration the operations of reeling, rearing and mulberry plantation. Yet, given the relatively large average family size in CCA (Table 24), the low level of utilisation of family labour in reeling is intriguing.

Table 24: CCA: frequency distribution of adult male family members

No. of adult male per family	No. of households
1	219
2	131
3	110
4	76
5	48
6	25
7	9
8	4
10	1
11	1
12	1
Total	625

The entrepreneurs in CCA, like in Hatibandha, get engaged as hired reelers or turners in larger enterprises. This is particularly evident among the poorer of the reeler households, who hardly have 10-12 days job at the family unit, depending primarily on the owned volumes of cocoons. In the larger units, on the other hand, reeling continues for 30-45 days in a season, and the employer prefers to employ hired workers having adequate experience in reeling. Moreover, the employer prefers those who would remain in the job throughout the season, as that would enable to maintain *uniformity* in the quality of yarn produced by the unit. Thus, many of the owners of smaller reeling units become quasi-permanent workers in larger units. The own reeling unit, in fact, earns him the latter kind of job and puts him in a better position in the wage labour market than the, by occupational status, wage labourers. The duration of employment is rather more important to a small reeler. Despite wages in the larger units often being less than that he pays to the hired labour in the owned unit, he moves on to the larger enterprise for a longer-term employment as well as higher aggregate income.

As a result, first, while the wages of the reeler is Rs 30 or so in the PA, it is around Rs 25 in CCA. Second, in PA, the turner or helper is usually a child-

labour whose wage is not more than Rs 17, whereas in CCA there is hardly any child labour working as turner either in katghai or IC units. In CCA, the child-labour occasionally gets employed as helper in the IC units in Sershahi, Mozampur or Alipur at Rs 12-15; it is often even less for the new-comers. The incidence of child-labour, however, is more frequent in bidi-making. Thus, it is not that the economic conditions of the households in CCA are relatively better and hence fewer incidence of child-labour in reeling. Supplementary evidence on the school-going children of the 629 selected households reveals higher propensity to join workforce at an early age, in CCA.

It is also found that the labour mobility across the centres of reeling within CCA is quite restricted. One of the factors is that skill has assumed a location-specific character. For instance, a reeler in Alipur or Sershahi who is adapted to warp or finer weft yarn reeling is not found suitable in, say, Khaltipur—the place known for its coarse weft. In this sense there exists differentiated skills, and, for that matter, the labour market. However, if we exclude the extreme cases like Alipur, Sershahi, the restricted labour mobility due to 'appropriate skill required' has limited explanatory capacity. In fact, the local job seekers by restricting the 'outsiders' from entering into the local labour market have been able to keep the wage-rate at a higher level. In Khaltipur, there are altogether 600 households whereas there are 250 katghai and 60 (mostly 2 basin) IC units. During the 'peak' period, at least, 750 workers are required per day. Since supply is restricted to the locality, the labour-hour remaining the same as that in Sershahi, Alipur or Mozampur, the wage rate in Khaltipur is higher despite low quality yarn production (Table 17). Thus, *wage* becomes inconsequential in explaining the degree of *skill* or *productivity* of labour.

It may appear that, given the supply conditions of labour, the entitlements to working capital would determine the size of operation. However, since most of the cocoons in CCA are transacted on-credit, the volume of working capital has a rather limited impact on the volume of reeling. If cash-purchase were the *norm* of the market, the survival of the smaller units would have been very difficult, unless they had easy access to soft loans, and the yarn exchanged in cash. The current credit demand of an average single-basin unit is in the range of Rs 20,000-30,000 for a period of at least six months. This amount of loan would allow him to purchase about 600-1200 kilos of cocoons (depending on the cocoon prices), in a season. Out of the yarn sale proceeds,

the reeler buys cocoons in the next season, and repays part of the loans. But, suppose all the reeler households somehow mobilised the required amount of working capital. Then, that would create a supply-demand imbalance in the cocoon-market unless the supply of cocoons is sufficiently price elastic. In the case the supply of cocoons is fairly fixed, the yarn market has to accommodate the consequent increase in cost of production.

As mentioned earlier, there is an upswing, of late, in installing IC as a direct consequence of increase in foreign exports. Out of the 321 units set up during 1991-93, 212 are ICs and the rest are Katghais. Of these newly installed ICs, 207 are small-, and the rest medium-scale units. The average annual output of the 207 small IC units is about 53 kilos per basin. Moreover, low *mean* is also associated with high *variance*. This is largely because some of the units did not reel yarn in all the preceding seasons. Many of the units were closed in the last December-January season—the best productive season. As compared to the peripheral reeling centres, an average annual output of 53 kilos per basin is certainly low. The average output per worker in CCA, however, is comparatively lower due to the production of relatively superior quality yarn requiring longer labour-time per unit of production.

The setting up of a 3-basin IC although cost-wise is higher, yet more economic than a 2-basin unit as regards the scale of operation. However, it is found that, of the 212 IC units set up during 1991-93, 89 are 2-basin units, 58 are 3-basin, 30 are 4-basin, 12 are 5-basin, 21 are 6-basin, and only one is a 12-basin unit. There is also one single-basin IC. Given the general underutilisation of capacity in CCA, the choice of technology—high or low economies of scale—becomes subservient to the capacity to mobilise the required initial capital. However, a quick recovery of the sunk capital is also important, since the entrepreneur's seed capital is generally much smaller in size than the borrowed funds. The uncertainties regarding the future conditions of the output market as well as the availability of cocoons which hinges more on relations than on market forces make the recovery-period uncertain.

The annual output of the newer units, on an average, is found to be lower than the older units. The annual average output per basin of the IC units whose age is less than 10 years, is about 84.6 kilos (coefficient of variation, CoV=59.1063). By comparison, the average output per katghai of more than 10-year old units is about 117 kilos (CoV=56.1798). On the other hand, the CoV of outputs of the units those came up during 1991-93 is found to be higher

(72.3385). In brief, first, the older katghai units have been able to increase their annual output per basin. Second, the IC units must be facing problems either from the supply-side (i.e. availability of adequate volumes of cocoons) or from the demand-side (i.e. demand for particular type and variety of yarn at remunerative prices), or both, resulting in significant underutilisation of capacity.

The supply-condition of cocoons to a particular reeling unit (a) determines the cost-effectiveness of a particular technology, and (b) influences the decision regarding the product-mix of warp and weft yarn. IC is cost-effective for reeling warp yarn in the specific output-market conditions. For better quality warp, the HYV cocoons are found to be suitable. However, in West Bengal, the HYV silkworms are reared only in December-January and March-April, seasons. Yet, in those seasons, the entire crop never consisted of HYV. Thus, there is low per-capita availability of such types of cocoons. Warp yarn could also be reeled out of Nistari cocoons. But, at the given market prices, this does not seem profitable. Thus, only those who have been able to procure additional volumes of HYV cocoons from alternative sources in order to keep their units running at full-capacity are engaged in the reeling of warp yarn. The purchase of cocoons from other states such as Jammu and Kashmir are made in bulk, just after harvest, and in-cash. This requires a huge volume of working capital which none but the relatively rich households are able to mobilise. Moreover, the unpredictable fluctuation of yarn price makes inventory building risky. On the other hand, Nistari cocoons are available locally, on-credit, and could be purchased in required amounts according to one's own desirable size of inventory. Thus, the distinction between the warp and weft yarn production ultimately boils down to a differentiation of the reelers—those who reel warp yarn are usually found economically better off than others.

The warp-weft distinction that has resulted in locational variation also developed some in-built rigidity. There is no silk testing centre in the state to which the sellers or buyers have access. Thus, entire transactions are made on a subjective basis, except for those who have the distinguished skill of identifying 'good' and 'bad', be they sellers or buyers. The simplified process of fixing price in yarn trading is to find out the location of the reeling unit producing the yarn. This leads to lack of standardisation in silk production as well as exchange, in West Bengal. If, a reeler in a particular village, which is otherwise known for its warp yarn, reel weft yarn, or *vice versa*, the commodity is very

likely to fetch unremunerative price. In other words, a market that has no independent mechanism to discriminate quality certainly would impose constraints on the flexibility of regulating the output-mix in response to market signals. This has a dampening effect on the reallocation of resources to maximise *ex ante* returns.

The market in the state sends 'wrong' signals otherwise also. Let us look into the pattern of transaction in the government regulated Bangalore Silk Exchange, in Karnataka, during a particular month, viz., May 1993 (Table 25). The volume of trade at the Bangalore Silk Exchange did account for about 88 per cent in quantity and 86 per cent in value of the total transaction in all the Silk Exchanges of the State (*Indian Silk*, July 1993, p.58). It is evident that the volume transacted had no direct correlation with the *denier*-wise prices (Table 25). Further, price has no one-to-one correspondence with the denier of the yarn. The 14/16 denier fetched a minimum of Rs 825, and a maximum of Rs 1058 per kilo, during May 1993, while the price of a much thicker yarn, i.e., 30/32 denier was either equal to or more than the former. Thus, unlike in West Bengal where yarn are classified into warp and weft, and price does not have a systematic relationship with *denier*, in Bangalore Silk Exchange price does reflect the 'use value' of the different types of yarn.

Table 25: Bangalore Silk Exchange: price of filature/cottage basin yarn, during May 1993

Denier	Quantity transacted (kilos)	Price (Rs per kilo)		
		Min	Max	Average
13/15	4010	830	1120	1015
14/16	4275	825	1058	956
16/18	8445	625	1050	881
18/20	7068	750	1080	893
20/22	9654	665	1200	968
22/24	141	680	752	719
24/26	470	800	1060	919
26/28	537	796	950	853
28/30	1159	535	1120	995
30/32	935	825	1075	949

Source: *Indian Silk*, July 1993.

The divergence of price and cost of production, in CCA, is evident in Table 26. The cost of reeling in IC is relatively higher but that is not compensated by the price of the product, thereby resulting in lower return as compared to that in the villages using vintaged technology. The villages those who have specialised in weft production have been able to lower the costs of production and also sell their products at a higher price. In fact, the traders attempt to minimise 'uncertainty' has given rise to a kind of arbitrariness whereby the *grades* of yarn are decided by the location of production. There is no *unique* economic calculation by which one would *ex ante* ascribe a particular technology, or a particular process of production, or a particular product-mix as relatively profitable. Market does not give the kind of signals by which an *ex ante* decision regarding the reallocation of resources would ultimately turn out to be rational. The producers, thus, adopt a kind of 'flexible specialisation'. In a large number of IC units, in CCA, there are Katghais also, ready for use.

Table 26: Locational divergence of cost of production, price and return from weft yarn production (1)

Village cluster	Average production per 40 kilos of F_1 cocoons (kilos)	Cost of reeling (Rs)	Price of yarn (Rs per kilo)	Cost of cocoon (Rs)	Gross return (Rs)	Net return (Rs)
Alipur, Sershahi [2]	3.863	475	548	1600	2117	42
Marupur, Mozampur [3]	3.766	475	574	1600	2162	87
Khaltipur [4]	3.909	350	534	1600	2087	137
Gayeshbari, Choto Sujapur, Bakharpur [5]	3.812	450	652	1600	2485	435

Notes: (1) The estimates are based on February 1993 prices, (2) areas of IC and warp production, (3) areas of IC and only weft production, (4) katghai area with only inferior grade weft production, and (5) areas of katghai and superior quality weft yam.

It is thus very obvious that the input, output and labour markets together have restricted investments in technological upgradation, in an otherwise

traditional economy. When the probability of failure has a high percentage of certainty, very few entrepreneurs are going to undertake the economic activity as a principal occupation. The disequilibrium out of initial 'shocks' (like, e.g., sudden spurt in demand) soon precipitate into a low level equilibrium, as it happened in CCA, in particular. The household-wise data on occupation reveal that 60 per cent of the surveyed households earn about 50 per cent of the aggregate family income from reeling (and rearing, where applicable), and for the bulk of the rest the proportion is still lower. There are, of course, indications of attempts by the households to move away from the peasant form of economic organisation. However, due to the lack of a general environment conducive to such a development trajectory, the process is reversed to ultimately reach almost to the initial position. The organisational form of weaving, in the state, constitutes only a part of the general environment. In brief, the institutional framework dictates the kinds of skills and knowledge perceived to have the maximum pay-off.

9 Summary and Conclusion

Let us first summarise the salient observations emerging out of the study.

(1) There are basically two options of technology—IC and katghai. The capital-labour ratio is higher in the former. IC is mostly used with hired labour while katghai with family labour. Further the permanent labour to casual labour ratio is lower in IC than that in katghai. The 'permanent labour' required in katghai are mostly provided by the family.

(2) The wage rate to capital cost ratio is generally considered as guiding the capital-labour ratio or the choice of technology. However, despite comparatively higher wage rate to cost of capital ratio in katghai, in CCA, there is large concentration of this vintage of technology.

(3) The technology use pattern is location specific and is explained by the input as well as output market rather than by the supply condition of labour. We find that the cost of capital and labour remaining the same, the capital-labour ratio—the technology—varies. The entitlement to working capital is a better approximation of the phenomenon. And, it is the input/output market that changes or determines the entitlement.

(4) The supply of labour depends on the expected time-horizon of wage income, not just wage differential between sectors. If the time-horizon were too narrow, the supply would go down with necessary implication for the

growth of the industry.

(5) Entrepreneur and labour are often overlapping because of the lack of dynamics in the industry notwithstanding its export potential. The market failure in allocating resources efficiently seems to be crucial for the lagged response of the industry to export as well as domestic demand.

The development economics in the 1990s have brought to the fore the question of alternative development strategies, redefining the balance between state, market and civil organisations, in the face of both market and government failure, with relatively more important role for civil organisation. But, why the collective action—the *khadi* societies mediating the public and private spheres—could not emerge as a viable alternative? Endogenous factors like the characteristics of the (a) group itself, (b) object of cooperation, (c) game set up, (d) individual internalisation of social norms, and similar other factors (de Janvry *et al* 1993) themselves prove to be no guarantee of success against market failure (also *see* Banerjee 1995). The *khadi* yarn are though better, quality-wise, and the workers/members are provided with social security, however meagre it might be, yet the proportion of the khadi outputs to the aggregate remained inconsequential. In fact, the dominating trading capital, by organising putting-out contracts, has been able to pre-empt the cooperative form of 'resistance'. How this configuration acquires stability?

To put this rural non-farm sector in the perspective of agricultural growth, West Bengal agriculture (all-crop) experienced an exponential growth rate of 4.1 per cent per annum, during the period from 1977-78 to 1995-96 (Sanyal *et al* 1998). This was much above the all-India average growth rate. At the district level, Birbhum was far behind the West Bengal average with a growth rate of 2.9 per cent while Murshidabad was lagging behind with 3.8 per cent growth rate of all agricultural crops. Of the selected districts, in this study, Malda had a growth rate (4.1 per cent) as high as that of West Bengal average, during the period.

The wage-gap between agriculture and rural industry is found to be higher in CCA than in the PA (Table 17). The comparatively higher agricultural wage rate in CCA may be due to higher agricultural growth rate in Malda as compared to Murshidabad or Birbhum. Yet, not only there is no out-migration from the reeling sector in CCA there is, in fact, in-migration of, especially, underemployed in agriculture. Further, despite relatively high agricultural growth

rate in Murshidabad the farm and non-farm wage-gap, there is rather narrow. In CCA. where the industry has long been emerged as a specialised occupation, the wages are even less than those work in the brickfields. Further, the wage rate (Table 17) in bidi-binding and reeling activities are almost similar though the latter is a more skilled work. The depressed wage in the non-farm sector is further evident in silk weaving in the state. The *imputed* wage rate of the self-employed weavers is found to be lower than the agricultural wage rate (Banerjee 1995). In other words, the labour market condition is such that wage fails to give voice to skills or productivity. One of the outcomes is the foreclosure on the development possibility of silk powerlooms depending on the locally available raw material. Because, the tensile strength of the yarn produced in the state is unsuitable for powerloom weaving.

We have witnessed the propensity to invest in skills and knowledge to survive competition between organisations. Yet, we find little empirical support to what North (1995) suggests: 'The kinds of skills and knowledge individuals and their organisations acquire will shape evolving perceptions about opportunities and hence choices that will incrementally alter institutions' (p. 23). New institutional economics sees changes in relative prices as a major force inducing change in institutions. To the extent it employs price theory as an essential part of the analysis of institutions, as the mechanism of behavioural analysis of all the organisations (including political), it captures only partially the dynamics of institutional change.

On the whole, this study points to the weaknesses of methodological individualism that emphasises how individual action gives rise to institutions and institutional change—the core of new institutional economics. But, it also does not find much evidence in support of Veblenian old institutional economics that emphasises the effects of new technology on institutional schemes.

The institutional structure that is best for a particular society depends on its political settlement. The net effects of an institution—formal or informal—depend not just on the institution and the production technologies it coordinates but also and critically on the balance of power between the classes and groups affected by that institution, that is, on the political settlement (Khan 1995). The stability of the *settlement* depends too much on the political organisations on whose support the stability of institutions depends. A better work condition in the informal sector would only be ensured by the state legislation. Indian trade union politics have so far championed the interest of the organised sector

workers which constitutes only about 10 per cent of the economically active population, worsening the balance of power between the large majority of Indian working population and the political institution. In other words, had there been strong politics in the informal sector the institutional change halting the processes of informalisation, which otherwise usually takes longer period. would have been faster making the sector economically competitive and viable.

References

Banerjee, D. 1993. Development and women: a case study of mulberry silk production in West Bengal, in J. Acharya (Ed.), *Women in Development*, Delhi, Indian Publishers Distributors

_____ . 1995. Market and non-market configurations in rural West Bengal: local organisations and silk weaving, *Economic and Political Weekly*, vol. 30, no. 47

Chandrasekhar, C.P. 1993. Agrarian change and occupational diversification: non-agricultural employment and rural development in West Bengal, *Journal of Peasant Studies*, vol. 20, no. 2

Currie, R. 1997. Global silk industry: today and tomorrow, *Indian Silk*, vol. 35, no. 12

de Janvry, A, E. Sadoulet and E. Thorbecke. 1993. Introduction, (State, market, and civil organizations: new theories, new practices, and their implications for rural development), *World Development*, vol. 21, no. 4

Government of India (GoI), Ministry of Finance, *Economic Survey*, New Delhi

_____ , National Sample Survey Organisation (NSSO), 1997, *Operational Land Holdings in India, 1991-92*, NSS 48th Round, New Delhi.

_____ , 1997, *Employment and Unemployment in India, 1993-94*, Fifth Quinquennial Survey, NSS 50th Round.

___, Registrar General and Census Commissioner, *Census of India 1991*, Paper 2 of 1992, New Delhi

Government of West Bengal (GoWB), *Economic Review*, various issues, Calcutta

Harriss, J., J. Hunter and C.M. Lewis (Eds), 1995. *The New Institutional Economics and Third World Development*, London, Routledge

Hicks, J. 1969. *A Theory of Economic History*, London, Oxford University Press

Indian Silk, Central Silk Board, Government of India, Bangalore (monthly)

Khan, M. 1995. State failure in weak states: a critique of new institutionalist explanations, in Harriss *et al* (Eds)

Kuznets, S. 1974. Modern economic growth: findings and reflections, in *Population, Capital and Growth: Selected Essays*. London, Heinemann

Sanyal, M.K., P.K. Biswas and S. Bardhan. 1998. Institutional change and output growth in West Bengal agriculture, *Economic and Political Weekly*, vol. 33, nos. 47 and 48

Sonwalkar, T. 1993. *Handbook of Silk Technology*, New Delhi, Wiley Eastern

Ullal, S.R., and M.N. Narasimhanna. 1987. *Handbook of Practical Sericulture*, Central Silk Board, Government of India

Notes

[1] Relates to public sector and non-agricultural establishments in the private sector employing 10 or more persons (GoI, *Economic Survey*).

[2] *Census of India 1991*, Paper 3 of 1991, Table 4.

[3] Distribution of households (per 1000) by household type—Rural

State	Self-employed in:		Agricultural labour households	Other labour households	Others
	Agriculture	Non-agriculture			
All-India	378	127	303	80	112
West Bengal	272	197	326	103	102

Source: NSS 50th Round (1993-94), Report No. 409, Table 4.3.1.

[4] The unit of expressing the linear density of silk filaments and man made fibres and yarns, given by the weight in grams per 9000 metre of material.

[5] Doupion silk means raw silk reeled either entirely from double cocoons (a cocoon jointly built by two silk worms), or form a mixture of double cocoons, or even from single cocoon only, but reeled in such a way as to give an effect of doupion.

[6] Cocoons built by a silkworm race with two generations (life cycles) in a year.

[7] Cocoons built by a silkworm race with more than two generations (life cycles) in a year.

[8] The paddle charkha is usually made by the artisans in Sujapur, and costs about Rs 250.

[9] The number of kilograms of cocoons required to yield one kilo of raw silk. The raw silk yield is expressed in terms of renditta.

[10] Brushing is an act of transferring newly hatched silkworms from the egg sheets on to the rearing trays.

[11] One dfl = The number of eggs laid by one moth.

[12] Slub: A defect consisting of an abruptly thickened place in a yam usually caused by the inclusion of fly or clearer waste along with the regular yam.

CENTRE FOR STUDIES IN SOCIAL SCIENCES, CALCUTTA

OCCASIONAL PAPERS SERIES

Some recent papers in the series

152. MANJUSRI BANDYOPADHYAY & PRANAB K. DAS: Fundamentals and Share Prices in the Drugs and Medicines Industry.

153. TAPATI GUHA-THAKURTA: Traversing Past and Present in the Victoria Memorial.

154. PRANAB KUMAR DAS: Stochastic Rationing of Credit and Economic Activities in a Model of Monopolistic Competition.

155. DEBDAS BANERJEE: Rural Informal Credit Institution in South Asia: An Unresolved Agrarian Question.

156. DIPANKAR DASGUPTA: New Growth Theory: An Expository Device.

157. MEENAKSHI RAJEEV: Money and Markets.

158. PRABIRJIT SARKAR: India's Foreign Trade and Rural Exchange Rate Behaviour: An Analysis of Monthly Data Since January 1980.

159. TAPATI GUHA-THAKURTA: Archaeology as Evidence: Looking Back from the Ayodhya Debate.

160. NITA KUMAR: The Modernization of Sanskrit Education.

161. SAUGATA MUKHERJI and MANOJ KUMAR SANYAL: Growth and Institutional Change in West Bengal Agriculture 1901-1988.

162. MEENAKSHI RAJEEV: Monitary Trade, Market Specialization and Strategic Behaviour

163. PRABIRJIT SARKAR: Are Poor Countries Coming Closer to the Rich?

164. SAMARESH BARDHAN: Electronics Industry in India: Profitability and Growth, 1990-94.

165. AMIYA KUMAR BAGCHI: Economic Theory and Economic Organization, I, A Critique of the Anglo-American Theory of Firm Structure.

166. DEBDAS BANERJEE: The Political Economy of Imbalances Across Indian States: Some Observations on 50 Years of Independence.

167. NITA KUMAR: Children and the Partition History for Citizenship.

168. BYASDEB DASGUPTA: A Review of Financial Reform in Developing Economies – With Reference to the East and South East Asia.

169. AMIYA KUMAR BAGCHI: Globalizing India: A Critique of an Agenda for Financiers and Speculators.

170. PRABIRJIT SARKAR: Uneven Development or Convergence ?

Printed by ALLIES. 26 Vivekananda Sarani. Calcutta-700078