
UNIT 33 THE QUESTION OF AGRARIAN GROWTH AND STAGNATION

Structure

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33.1 INTRODUCTION

This Unit aims to familiarise the reader with the main trends in agricultural production during the period 1850-1947. It specifically addresses the question of growth rates of acreage, yield and agricultural output. It also provides an overview of the main debates surrounding the issue of agricultural production. The Unit is structured as follows. The first section discusses the main issues in and the framework for understanding trends in agricultural production. The second section discusses the results of comprehensive agricultural production estimates at the macro level for the three key indicators : acreage, yield and output of both food grain and non food grain crops. Section III and Section IV analyse the production trends at the individual crop and regional level respectively. Section V examines the debate around agricultural production statistics of the period 1890-1946 and provides a brief discussion of 19th century production trends. Section VI provides the summary and conclusion to this Unit.

33.2 AGRICULTURAL PRODUCTION IN COLONIAL INDIA: A FRAMEWORK FOR ANALYSIS

The question of agricultural growth lies at the heart of the debate about the impact of colonialism in India. The issue of growing poverty, low rates of industrialisation and the destruction of handicrafts and traditional industry – the staple of the nationalist critique of colonialism hinged on the issue of agricultural growth. Did agricultural output grow fast enough under colonial rule to mitigate the consequences of population growth? Or in other words did food supply outstrip population growth during the colonial period? Then there is the question of commercialisation of agriculture. The colonial character of the economy was evident in the transformation of India from a manufacture exporting economy to an agricultural raw material exporting one. Did increasing production of cash crops for exports happen at the expense of food grains? Given that more than half the national income is estimated to have originated from agriculture and also because of the overwhelmingly agricultural character of

the workforce in India throughout the colonial period the centrality of agricultural output and its level and trend over time is crucial for understanding how the bulk of the Indian population fared under colonial rule. Apart from temporal changes in agricultural output, variations over space i.e. regional performance of agriculture is a significant issue. Did some regions grow while others stagnated or declined? If there were significant regional patterns discernible – what explains these variations?

Nationalist critiques of colonial rule and its impact on the standard of living of the people of India emerged in the middle of the 19th century. Dadabhai Naoroji's *Poverty of India and Un-British Rule* highlighted the utter poverty of Indian people by calculating the per- capita income in 1868-69 at Rs. 20. William Digby's provocative book 'Prosperous British India' (1901) castigated colonial rule for progressive impoverishment of the Indian population . While Naoroji's estimation of agricultural production was a single point estimate, Digby used three point estimates (1850, 1882, 1900) of agricultural production and national income. These estimations of poverty and low agricultural production gained credence due to the devastating series of famines of the late 19th century. There were several rebuttals of nationalist claims indicating low agricultural production and increasing impoverishment of population by the British Officials, the most notable being Lord Curzon's rebuttal of R. C. Dutt as also F.T Atkinson's (1902) systematic critique of Digby. (1902)¹

The trend and level of agricultural production has been the subject of intense debate since the late 19th century and has animated Indian historiography on the subject.² The nationalist school of historiography takes a substantially pessimist position, arguing that throughout the colonial period agrarian production was stymied: in the 19th century it barely kept pace with population increase while in the twentieth century, definitely lagged behind growing population. The nationalists blamed Colonial State policy of non –development, free trade, land revenue system, forced nature of commercialisation for the poor performance of agricultural production and saw the devastating series of famines in the late 19th century and early twentieth century as a direct consequence of such policies. Apart from the official challenge mentioned above, a revisionist view, most notably represented in the work of M.D. Morris and A.Heston (1963), asserted that there was substantial expansion in agricultural output throughout the 19th and the first half of the twentieth century, stronger in case of commercial crops and relatively slower for food grains, reflected in the slow but positive growth in the per capita national income. In the revisionist accounts colonial state policies were assessed positively. More recently, there has been a revival of the revisionist position specially in the work of Tirthankar Roy (2000), which has shifted attention away from the colonial state policy to focus on the process of commercialisation of agriculture. Increasing integration of Indian economy with the global market in the period 1860 – 1920s and the spur given by exports to commercialisation led to rising per capita income and sharp growth in production and productivity in agriculture. Cash crop production led growth was fuelled by productivity growth and rising income through out the period. This period of relatively open economy and growth was disrupted by the great depression of the 1930s . The 'malign' state of the nationalists is replaced by benign market in the neo revisionist account as the driver of agricultural growth.

¹ Bipan Chandra *The Rise and Growth of Economic Nationalism*(New Delhi, 1966) pp28-40 provides a synoptic account of the late 19th century debate on poverty and agricultural production between nationalist leadership and the colonial officials.

² See for instance *Indian Economy in the 19th century : A Symposium*(Delhi, 1969)

Since the debate over agricultural output growth and its various components has critically hinged on interpretation of agricultural statistics of production and productivity, it is useful to examine the sources and coverage of such statistics. Agricultural statistics became available at the all India level following the recommendation of the Indian Famine Commission (1880). Stray statistics especially of commercial crops were available from the 1860s during the cotton boom. Comprehensive, though imperfect, statistics became available from the end of 1880s. The main source of the agricultural statistics at the All India level were the *Season and Crop Reports* published by the Provincial Directorate of Agriculture which provided district level statistics of cropped area, area under individual crops and estimates of output of each crop. Valuable information on harvest prices of crops and rainfall data was also published in these reports. The information thus generated was collated into two annual publications at the All India level – *Agricultural Statistics and Estimates of Area and Yields of Principal Crops in India*. The former provided data only on area under cultivation while the latter gave figures of area and output of eighteen crop forecasts, which occupied more than 95 per cent of total cropped area of the country. The *Season and Crop Reports*, which formed the basis of the agricultural statistics, was issued mainly for British Indian provinces while the national level statistics also included figures for some Princely States.

The *Season and Crop Report* estimated the total output for each (major crop) of the district by a simple formula $Y = A \times SY \times CF$, where Y = Total output, A = Area under the crop, SY = Standard or Normal Yield, CF = Seasonal Condition Factor. The Standard Yield was defined as a 'figure which in existing circumstances might be expected to be attained in the year if the rainfall and the season were of a character ordinary for the tract under consideration, that is, neither very favourable nor the reverse...the average yield on an average soil in an average year'³ Standard yield was usually derived by a series of crop cutting experiments of yields in the district and was subject to periodic revision (five years). Yet as is evident from the official definition with its emphasis on 'averageness', statistical accuracy or randomness of sample were hardly the criterion for choosing a particular figure. Seasonal condition factor (SCF), on the other hand, was a purely subjective estimation of the condition of the crop usually denoted in annas (1/16 of a rupee or 16 annas) which was then converted into a per centage of the normal or standard yield. Thus an 8 anna crop yielded a SCF of 50 per cent. The agency which was charged with reporting the condition factor as well as acreage under particular crop in a village in temporarily settled area (ryotwari or mahalwari) was the village *patwari*. His estimation was then subsequently corrected by a series of supervising officers and finally by the Director of Agriculture at the provincial level. In the Permanently settled areas it was the village chowkidar who was the primary reporting agency. Acreage figures in temporary revenue settlement areas were drawn with reference to the village records, but in the permanently settled areas, since the village records for revenue purposes were non-existent, the acreage figures were more of an 'eye estimation' successively corrected by the district level officers. Acreage figures were thus notoriously deficient for the permanently settled provinces such as Bengal, Bihar and Orissa except in districts where cadastral surveys and settlement operation had been carried out.⁴

³ *Estimates of the Area and Yield of the Principal Crops of India* Appendix 1, 1938 citing an 1897 circular.

⁴ Cadastral Survey and settlement operations were carried out in Bengal and Bihar districts beginning in the 1880s and most districts were covered by the end of 1920s. Revision surveys and settlement were carried out in fewer districts.

33.3 AGRICULTURAL PRODUCTION: 1890-1947

George Blyn's monumental work on the agricultural production in British India carried out in the late 1940s and published in 1966 remains to date the most important account of the trends in crop production in India. Blyn utilised the Official series published in the *Estimates* and corrected it for discrepancies due to non reporting of crop figures for certain years in some Provinces. He produced three series that of output, acreage and yield of eighteen principal crops, eight food grain crops and ten non food grain crops for the years 1891/92- 1946/47. For aggregation of different crops the out turn and series was converted into value terms at constant prices of each individual crop based on average prices the period 1924-29. For the purpose of regional analysis, Blyn grouped together the provinces into six groups. Crops and regions for which Blyn produced production estimates are summarised in Table 1.

Table 1

Foodgrain	Non Foodgrain	Regions
Rice, Wheat, Bajra, Jowar, Maize, Barley, Gram, Ragi.	Cotton, Sugarcane, Linseed, Rape and Mustard, Sesame, Jute, Tea, Indigo, Tobacco	Greater Bengal, United Provinces, Greater Punjab, Bombay-Sind, Central Provinces, Madras

The all India production figures are presented in Table 2 which provides the five yearly average figures for acreage, yield and output

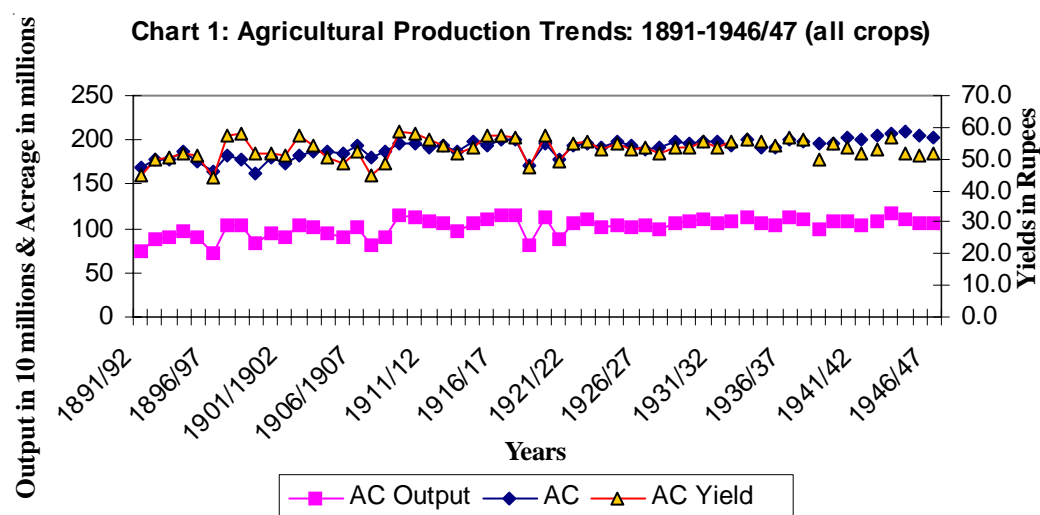
Table 2: Annual Average Agricultural Production : 1891-1946

Year	All Crops (AC)			Food Grain (FG)			Non Food-Grain (NFG)		
	Output	Acreage	Yield	Output	Acreage	Yield	Output	Acreage	Yield
1891-1895	8798	177	50	6911	147	47	1899	30	63
1896-1900	9167	174	53	7129	146	49	2038	28	72
1901-1905	9578	183	52	7308	151	49	2271	32	71
1906-1910	10017	190	53	7573	155	49	2444	35	70
1911-1915	10526	193	55	7801	156	50	2724	36	75
1916-1920	10243	189	54	7580	154	49	2657	35	75
1921-1925	10454	195	54	7649	158	48	2805	37	76
1926-1930	10530	195	54	7274	156	47	3256	39	83
1931-1935	10716	195	55	7353	158	46	3363	47	92
1936-1940	10804	199	54	7062	158	45	3742	51	91
1941-1946	10819	205	53	7347	169	43	3472	36	96

Note: Output in million Rs, Acreage in Millions, Yield in Rs.

Source: George Blyn (1966).

The absolute figures and the trends can be visualised from Chart I. But for an analysis of the trends it is important to examine the trend growth rate. The trend growth rate is computed such that the annual fluctuations are eliminated and an average growth rate for a specified period can be estimated. Blyn computed the trend growth rates by averaging the growth rates of ten overlapping decades beginning from 1891. The growth rate is denoted in per cent per year. Most of the analysis in this and subsequent sections will focus on trend growth rather than absolute figures.



AC Output = all crops output
AC = all crops acreage
AC Yield = all crops yield

Table 3: Agricultural Production: Trend Growth Rate 1891-1946 (per cent per year)

	Output			Acreage			Yield		
	1891- 1946	1891- 1916	1921- 1946	1891- 1946	1891- 1916	1921- 1946	1891- 1946	1891- 1916	1921- 1946
All Crops	0.37	0.84	0.35	0.40	0.67	0.35	0.01	0.47	-0.02
Food grains	0.11	0.61	0.03	0.31	0.35	0.39	-0.18	0.29	-0.44
Non food grains	1.31	1.66	1.08	0.42	0.86	0.03	0.86	0.81	1.15
Population	0.67	0.44	1.12						

George Blyn (1966).

From Table 2 and 3 the following conclusions can be drawn:

- 1) Between 1891 and 1947, the annual growth rate of output of all crops was low (0.37 per cent) reinforcing the picture of near stagnation of agrarian production over the whole period. Viewed alongside the annual growth rate of population (0.67 per cent) it is quite clear that agricultural production lagged behind population growth measured over the whole period.
- 2) Practically the whole of the growth of agricultural production came from the expansion of acreage under crops –thus there was in fact near complete stagnation in agricultural productivity. Low quantitative growth was accompanied by the absence of qualitative growth in agrarian production.
- 3) However this dismal picture of low output growth and stagnation of productivity needs to be analysed by disaggregating the trend over time and separating out the trends for different crops. Thus in terms of temporal span, all three measures of agrarian production present a more favourable picture in the first half (1891-1921) of our period compared to the later half (1921-47). In the first half agricultural growth manages to keep ahead of population growth. It is mainly due to the drastic deceleration of growth of crop production in the second half that the overall growth rate for the whole period is pulled down. Since population growth accelerates during the second phase, at nearly two and half times the rate of the earlier period, per capita output plunges down by nearly 30 per cent.

- 4) Non Food Grain(NFG) production during the whole period displayed sufficient dynamism with growth rate of output, acreage and yield being substantially higher than that of Food Grain (FG) crops and above the growth rate of population. An interesting aspect of the performance of NFGs is that the most of the growth of output of these crops was not from acreage expansion but from productivity growth. Thus between 1921 and 1947, while acreage under NFG crops stagnated, output grew by a healthy 1.08 per cent per annum and the resultant productivity growth was 1.15 per cent per annum.
- 5) In contrast to this food grain (FG) output growth was a near stagnant 0.11 per cent while productivity actually declined over the whole period at 0.18 per cent. FG output growth in the first period was above the population growth rate but after 1921 FG output stagnated at 0.03 per cent while population growth soared to 1.12 per cent (leading to a sharp decline in per capita food grain production.).

Blyn's agricultural production figures based on official statistics show two phenomena that need explanation: a) The lag between population growth and yields per acre intensified in the last quarter of British rule and b) the contrast in the performance of the NFG or cash crops against that of FG. We can begin explaining these macro trends if we further disaggregate these trends for different crops and regions.

33.4 INDIVIDUAL CROP PRODUCTION TRENDS

We first examine the broad changes in the composition of crop acreage over the period 1891-1946.

Table 4: Crop Composition : 1891-1946

Crops	1891-95 million acres	Per cent of all crops	1941-46 in million acres	Per cent of all crops
Rice	66	37.3	74.1	36.0
Wheat	21.9	12.4	26.4	12.8
Jowar	20.9	11.8	22.1	10.7
Gram	11.1	6.3	15.1	7.3
Bajra	11.7	6.6	15.1	7.3
Barley	5.2	2.9	6.7	3.3
Maize	5.1	2.9	6.3	3.2
Ragi	4.4	2.5	3.4	1.7
Total Food grains	146	82.5	169	82
Cotton	9.6	5.6	11.6	5.6
Sugarcane	2.9	1.6	3.6	1.7
Jute	2.2	1.1	2.5	1.2
Groundnut	0.4	0.0	5.6	2.7
Oilseeds	12.5	7.0	11.1	5.4
Indigo	1.4	0.8	0.0	0.0
Total Non Foodgrain	30.4	17.2	536.5	17.7
All Crops	176.4	100	205.5	100

Source: George Blyn (1966).

What is remarkable is that there was hardly any change in the relative acreages under food grain and non-food grain crops. But there were fairly significant changes in the case of individual crops. To take up FG crops first. Acreage under rice and wheat expanded absolutely but there was no significant change in their relative weight in all crop acreage. Amongst the NFG crops, the only significant change was the rapid rise of groundnut as a major crop. From a completely insignificant crop at the beginning of our period 5 million acres were added in the next fifty years. This expansion of acreage was the maximum in Madras Presidency and to an extent in Bombay. During the same period total cropped area under oil seeds declined by nearly one and half million acres. This period also witnessed the total eclipse of indigo as an important cash crop – accentuating the trend beginning in the second half of the 19th century. Cotton acreage grew but most of the growth occurred in the first half of the period. In contrast, acreage of sugar cane expanded almost exclusively in the post 1921 phase and more spectacularly after 1931 when a protective duty imposed on imported sugar stimulated expansion. (Blyn 1966, pp.146-7)

Now as to the output of individual crops Table 5 shows the different trajectories of individual crops .

Table 5: Trend Growth Rates of Output and Yield : 1891-1946

Crops	1891-1946	1891-1916	1921-1946
Rice	-0.09 (-0.24)	0.35 (0.39)	-0.02 (-0.47)
Wheat	0.84 (0.38)	1.89 (1.25)	0.57 (0.02)
Jowar	0.05 (0.00)	0.50 (0.64)	-0.34 (-0.63)
Gram	0.26 (-0.26)	1.73 (0.52)	-1.15 (-0.88)
Bajra	0.72 (0.06)	1.86 (0.35)	-0.59 (-0.24)
Barley	0.02 (-0.12)	2.03 (0.71)	-1.34 (-1.11)
Maize	0.51 (0.21)	1.55 (0.88)	0.44 (0.10)
Ragi	-0.37 (0.12)	0.24 (0.29)	-0.98 (-0.10)
All Foodgrains	0.11 (-0.18)	0.61 (0.29)	0.03 (-0.44)
Sugar cane	1.30 (0.73)	0.22 (1.03)	3.00 (1.20)
Cotton	1.30 (0.95)	2.84 (0.98)	-0.01 (1.27)
Jute	0.27 (0.14)	2.13 (0.86)	-0.72 (-0.30)
Tea	2.74 (1.43)	4.24 (2.22)	2.08 (1.59)
Tobacco	0.03 (0.17)	-0.29 (0.72)	0.32 (-0.24)
Groundnut	6.26 (0.23)	8.74 (0.73)	3.24 (-0.61)
Rape and Mustard	0.07 (0.19)	0.59 (0.48)	0.03 (0.31)
Sesamum	0.09 (0.29)	1.22 (0.58)	-0.38 (-0.08)
Linseed	-0.47 (-0.10)	0.52 (1.05)	-1.27 (-0.80)
Indigo	-6.19 (0.47)	-6.02 (1.28)	-6.27 (-0.89)
All NFG	1.31 (0.86)	1.66 (0.81)	1.08 (1.15)
ALL CROPS	0.37 (0.01)	0.84 (0.47)	0.35 (-0.02)

Note: The figures in brackets represent the yield trend growth rates.

Source: George Blyn (1966).

Among food grain crops, rice was the predominant crop and the trend in the yield of the crop influenced the overall trends in food grains. Thus the decline in rice yield was the most important reason for the overall low performance of food grain crops generally. The decline was most pronounced in the second half (1921-1946). This must be contrasted with the trends in yield of the other major cereal crop – wheat, which experienced significant growth. But even in the case of wheat the rate of growth of output was more than three times faster in the first half of the period compared to the latter half. The yield of wheat rose by 1.25 per cent per year in the first half and fell in the second half to a near zero rate. Thus while all food grain crops except rice and ragi witnessed some growth in output during the whole period, all crops except wheat and maize experienced negative rate of growth during the second half of the period (1921-1946). Yield was positive for all crops in the first half (including rice) and negative for all crops in the second half (except wheat and maize which too saw a significant retardation in growth).

As we have seen, non food grains, as a whole performed better than food grain crops, but there were significant differences between individual crops. Production of tea remained buoyant throughout though, given the nature of its production (plantations managed by foreign companies), complete export orientation and low backward linkages, its impact on the general welfare of the population was minimal. Cotton, on the other hand, was an important cash crop grown in large parts of the Deccan, Central Provinces and in the canal colonies of Punjab by mainly peasant producers. Sugarcane was an important cash crop in United Provinces, Bombay and Bihar and was produced by small peasants. Jute was the main cash crop grown by small peasants in Eastern Bengal and supplied both domestic and export markets. Groundnut, which was a insignificant crop at the beginning of the period, became the dominant cash crop in Madras where it grew on relatively infertile soil unsuitable for cultivation of other crops. All these crops (excepting sugarcane) saw sharp increases in production between 1891-1916, stimulated largely by increasing exports. Except tea, where India had a strong market dominance, rest of the agricultural crop exports declined after 1921 which in turn slowed down the production growth of these crops.

Table 6: Value of Exports of Selected Agricultural Products, 1881-1941 (Rs Million)

	Raw Jute	Jute	Cotton	Cotton goods	Tea	Wheat
1881	43.7	12.0	111.5	21.7	30.7	11.2
1891	76.0	24.8	165.3	94.9	55	60.4
1901	108.7	78.6	101.3	123.1	96.8	0.3
1911	154.9	170	360.5	116.1	124.6	129.5
1921	163.6	530	416.7	156.4	121.5	41
1931	128.8	319	464.1	48.4	260	2.1
1941	78.4	244	—	147.2	278.8	4.9

Source: K.N Chaudhuri 'Foreign Trade and Balance of Payments (1757-1947)' in Dharma Kumar (ed) (1983), *The Cambridge Economic History of India*, Vol II, Delhi.

The stimulus of export markets as fillip to cash crop production can be seen also in the case of wheat- rapid growth till 1911 and relative decline afterwards. Production of wheat and cotton, were both stimulated by the massive expansion of canal irrigation in Punjab. Irrigation expansion seemed to have stopped by 1921 and that accounted for the retardation and relative decline of cash crop growth after 1921. Nearly 20 million acres of canal-irrigated area were added in the 40 years between 1885-1925.

33.5 REGIONAL CROP PRODUCTION TRENDS

Now let us look at the regional variations in the rates of growth. Apart from the crop wise growth differential there were regional variations too.

Table 7: Regional Trend Growth Rates of Agricultural Output, 1891-1946

	Food grain 1891-1946	Non food grain 1891-1946	All Crop 1891-1946	All Crop 1891-1916	All Crop 1921-1946
				(per cent per year)	
Greater Bengal	-0.73	0.23	-0.45 (0.65)	-0.40 (0.56)	-0.23 (0.95)
United Provinces	0.35	0.92	0.42 (0.40)	1.02 (0.00)	0.27 (1.07)
Madras	0.42	2.37	0.98 (0.80)	1.71 (0.75)	0.42 (1.08)
Greater Punjab	1.10	2.40	1.57 (0.93)	2.17 (0.20)	1.30 (1.41)
Bombay Sind	0.27	1.44	0.66 (0.71)	0.70 (0.30)	0.79 (1.45)
Central Provinces	0.29	0.97	0.48 (0.58)	1.73 (0.61)	-.56 (0.96)
British India	0.11	1.31	0.37 (0.67)	0.84 (0.44)	0.35 (1.12)

Note: The figures in bracket are trend growth rates of population.

Source: George Blyn (1966).

The regional trends show that the All India figures of low growth in crop output was largely a result of the negative growth rate in Greater Bengal. Rest of the five regions show on an average a slightly better growth of output over the whole period (0.80 per cent per year) which is ahead of the population growth rate by a very small margin . If by including Greater Bengal, the All India story of agricultural production presents a dismal picture of very low output growth and declining per capita production, by excluding it we have a picture of low output growth and stagnating per capita production. Yet here again the inter temporal variation is different between regions. In the first half the output growth is positive in all regions except Bengal but in the second half Central Provinces also shows a negative growth. In the first half of the period, all regions (excepting Bengal) have higher output growth rate compared to population. But in the second half, output growth rate of all regions are below the population growth rate. It is interesting to note that Greater Bengal and Rest of India display contrasting trends between the first and second half of our period. In Greater Bengal the rate of decline of output is reduced in the second half by nearly fifty per cent (-.40 to -.23 per cent per year) while in the rest of the regions of British India the rate of growth of output is drastically reduced by 66 per cent(1.41 per cent to .48per cent).

Let us stay with the regional contrast a little longer and explore the experience of Greater Bengal and Greater Punjab. These two regions represent two extremes in the performance of agricultural production. In Greater Bengal included Bengal, Bihar and Orissa and Assam. The main component of decline in all crop output was determined by the yields of rice which accounted for more than 75 percent of the total acreage. The Bengal figures in turn were determined largely by the rapid decline

in the rice output in Bihar and Orissa. If we exclude Bihar and Orissa, the figures of rice output in Bengal show stagnation rather than decline. What was the reason for the precipitous decline in the output of rice and other minor food grains in Bihar and Orissa? Blyn found that there was a fairly strong trend element in the total rainfall, which declined over the period 1911-46 for Bihar. But even after accounting for this possible decline there was still a large and unexplainable decline in rice output in Bihar and Orissa. This according to Blyn was a statistical aberration due to the continuation of a very high standard yield till 1922-23. This standard yield used for measuring annual yields was abruptly lowered after that year. The normal yield of Bihar and Orissa was from now calculated on independent crop cutting experiments, and this recalculated figure was now assumed to be the standard yield. To rectify for the presumed lower standard yield of rice for Bihar and Orissa, Blyn corrected the series by assuming the average output of 1937-41 to be the standard yield for the entire period.⁵ Thus with an assumption of a constant standard yield the Greater Bengal rice output was modified by Blyn to generate an alternative series for food grain output for Greater Bengal and British India as a whole. This modified series, raised the trend growth rates of food grain output of Greater Bengal by 58 percent for the whole period. The differences between the trend growth rates of the original and modified series for Greater Bengal and British India can be seen in Table 8.

Table 8: Trend Growth Rates: Agriculture Production-Greater Bengal and British India, 1891-1946

	Greater Bengal		British India	
	Original Series	Modified Series	Original series	Modified series
FG Yield	-0.55	-0.10	-0.18	0.04
AC Yield	-0.34	0.07	0.01	0.27
FG Output	-0.73	-0.15	0.11	0.30
AC Output	-0.45	0.00	0.37	0.55

Source: George Blyn (1966).

While the decline of Bihar and Orissa rice yield may have been a statistical aberration, it is doubtful if Blyn's correction assuming a constant yield for the whole period for all of Greater Bengal is justifiable since it lowers the initial base period figures by about 22 percent. Even with this most optimistic correction neither the food grain production nor all crop output could keep pace with the population growth. We still see a persistent decline in per capita food grain and all crop output over the whole period. The picture of stagnation and declining per capita output does not change substantially.

The trajectory of agricultural growth in Greater Punjab represents a sharp contrast to Greater Bengal. The overall output growth rate of 1.57 percent in Punjab is the highest in the whole of British India. This rate was composed of the food grain crop output growth rate of 1.10 percent (three times the All India Rate) and NFG output rate of 2.40 percent. In terms of temporal variation however we notice that the

⁵ Blyn reduced the average yield of the period 1891-1911 in Greater Bengal by 22 per cent each year to bring the 20 year average to the level of 1936-1941 (749 lbs per acre). This latter figure was then applied to the whole period 1891-1946. Thus with an assumption of a constant standard yield the Greater Bengal rice output was modified by Blyn to generate an alternative series for food grain output for Greater Bengal and British India as a whole. Blyn (1966) p222.

maximum growth was in the first half of the period (2.17 percent) which decelerates to 1.30 percent in the second half falling below the population growth rate (1.42 percent). Most of the expansion of output appears to have been due to the massive growth of acreage in the first half our period due to the great increase in cultivation in the canal colonies. Productivity (output / acre) growth rate was relatively less even though proportion of irrigated area to total cropped area increased substantially during this period. In 1885, only 29 percent of cropped area was irrigated in Punjab but by 1911 the proportion increased to 50 percent.

Table 9: Punjab Agricultural Production : Trend Growth Rates, 1891-1946

	Yield/acre			Acreage			Output			Population
	FG	NFG	AC	FG	NFG	AC	FG	NFG	AC	
1891-1916	0.30	0.52	0.47	1.70	1.75	1.75	1.99	1.56	2.17	0.20
1921-1946	0.47	1.70	0.90	0.39	0.50	0.44	0.92	1.80	1.30	1.41
1891-1946	0.31	1.13	0.62	0.87	1.20	0.96	1.10	1.40	1.57	.93

Source: George Blyn (1966).

If agricultural production in Punjab was driven by acreage expansion in the first half of our period, the growth in the second half is propelled by productivity growth specially in the NFG crops Cotton and Sugar. Extensive use of better seeds, the practice of intensive cultivation drove productivity up in these two crops.⁶ Though FG productivity also grew in the second half due to increased adoption of better seed and greater use of chemical fertiliser, the growth was not spectacular. The area of wheat under improved seeds grew from 5 percent in 1922 to about 50 percent by 1938-39, the irrigated area under wheat increased more slowly, and the improvement in wheat yields was even lower than the combined effect of these two factors would indicate. It seems that there were powerful counter tendencies operating to reduce yield specially in the food grain crops. One major counter tendency was the increasing problem of water logging and rising alkalinity of soil mainly as an effect of rapid growth of canal irrigation. It was estimated that nearly 24 percent of cropped area of Western Punjab districts were found to be beset with water logging in 1946-47.⁷ In the second half of our period, acreage expansion slows down as does productivity growth and consequently the output growth falls below the population growth. Blyn estimates that the trend of decline in per capita food production begins from the decade of 1911-1921 and in the next thirty years this decline was about 29 percent. So even in the most dynamic region of agricultural production, the spectre of declining per capita food grain production is an undeniable reality. But how rapid really was the growth before 1911? M.M Islam has argued that Blyn might have overestimated agricultural production growth between 1891 – 1911 and that the picture of Punjab's dynamism need to be substantially modified. Islam uses an alternative production series based on the *Season and Crop Reports* to show relatively lower rates of growth compared to Blyn. Islam suggests that Blyn

⁶ See Carl Pray 'Accuracy of Official Agricultural Statistics' in Sumit Guha (ed) *Growth, Stagnation Or Decline?: Agricultural Productivity in British India*, pp185-187 for extensive use of improved varieties of seeds in Sugar cane and Cotton and consequent rise in productivity. Acreage under improved variety sugar cane (Coimbatore variety) grew from 1per cent in 1921 to 78 per cent of the total acreage under sugar cane by 1944. Similarly larger area of Cotton came to be cultivated by high yielding American variety.

⁷ See M.M Islam 'Trend in Crop Production in Undivided Punjab' in Sumit Guha (ed) *Growth Stagnation or Decline?* P201-203.

overestimates the growth rates for food grain crops, in the period 1891-1906 (i.e before the publication of fuller production estimates of Season and Crop Reports) to arrive at a much rosier picture of Punjab agriculture.⁸

Table 10: Alternative Crop Output Trend Growth Rates : Punjab, 1891-1946.

	Islam's estimate 1891-1946	Blyn's estimate 1906-1946	Blyn 1891-1946
All crops	0.79	1.10	1.57
Foodgrain	0.42	0.41	1.10
Non Food Grain	2.64	2.10	2.40

Source: George Blyn (1966).

33.6 DEBATES OVER AGRICULTURAL STATISTICS

While Blyn's work on the agricultural production remains the single most comprehensive account of All India agricultural performance, several attempts have been made to improve upon it at the regional level. We need to consider some of these to reflect on the debate over agricultural stagnation and growth.

Blyn's agricultural production statistics was the basis for important estimations of national income by S.Sivsubrahmaniam for the period 1900-1947 and enjoyed a great deal of reputation in the radical nationalist historiography of the 1970s and early 1980s. However doubts were soon raised about Blyn's production estimates and the veracity of the official yield figures on which they were based. M.D Morris, an early dissenter, doubted whether the picture of decline food grain yield per acre could be sustained for the whole period. Citing an early study by Walter C. Neale, Morris argued that wheat yields in the districts of Muzaffarnagar and Bareilly increased by 900 percent between 1840-1940. Alan Heston provided the first systematic critique of the Blyn's production series by casting doubt over the official statistics especially on the Standard Yield and Seasonal Condition Factor components of the Production series. Clive Dewey debunked the official statistics because of the arbitrariness and unreliable methods used by those who collected the statistics, the patwaris and the Kanungos. Regional revisions were attempted by M.M Islam for Bengal and Carl Pray for Punjab. Islam revised the acreage and production figures of the 1920s and Pray argued that the official statistics were serious underestimates since they neglected the role of improvements in technology. The debate over the relative merits of Blyn's agricultural production series has been ably summarised in Sumit Guha (*Growth, Stagnation or Decline : Agricultural Productivity in British India, 1992*).

Those who have criticised Blyn's figures have focussed mainly on two components of the three that went into the making of the production series namely the Standard Yield and Seasonal Condition Factor (the product of these two elements gave the official yield or productivity). Heston's main criticism was that the official yield figures were subjectively estimated and were marked by an administrative bias. This bias was largely due to the proverbial " patwari pessimism" or the tendency on

⁸ K.L Datta, who also published an estimate of the Food grain output between 1890-1911 for Punjab found much higher initial crop out than Blyn and also a weak growth trend for that period. See arguments in favour and against Blyn's estimation in Punjab in Sumit Guha ' Introduction' in Sumit Guha ed) *Growth, Stagnation or Decline* pp22-25.

the part of the primary reporting agency to underestimate good years and overestimate bad years which led to systematic reduction of the seasonal condition factor. A second point of criticism was about the Standard Yield figures. It was argued that the standard yield figures were based on insufficient crop cutting experiments and were marked by large sampling errors, and changes in these figures did not reflect underlying yield trends. Heston demonstrated through a detailed analysis of the Bombay official yield figures that there was a declining trend over time which was unsupported by total rainfall trend during the period 1907-1947. (Heston, 1973) He suggested that the administrative bias was reinforced by a political bias towards remission of revenue (colonial officials were keen to show low yields and higher revenue remission to counter growing nationalist mobilisation). Secondly, Heston felt that standard yield figures were initially very high because European yields were projected on to India and when more realistic figures came to be adopted, there was a decline in Standard Yield figures over time. For Heston Blyn's downward trend in food grain crop yield was a statistical illusion. Since official yield figures were spurious, Heston emphasized that the picture of declining yield for food crops should be abandoned in favour of a constant yield for the whole period. He proposed that the yield figures of 1951-54 for all food crops based on extensive crop cutting methods should be applied to the acreage figures to generate a revised output series. For crops like cotton, sugarcane and tea, which showed a continuous increase in yield in the official series, he advocated the maintenance of official, yield figures.

How bad were the official yield figures in reality? It is interesting to note that for certain years in which both official yield and extensive crop cutting yields were published (1944-46), R.C Desai who did an extensive study of crop trends in 1937-1948 found that the official yields were underestimated vis a vis Crop cutting yields by a very narrow margin - 3.5 percent for rice and 1.5 percent for wheat. R.C Desai V.G Panse and P.V Sukhatme who were the pioneers of crop cutting method for yield estimations generally supported the Patwari estimations. Secondly, Heston's objections against declining condition factor in the official series due to administrative and political bias has been found to be untenable by Ashok Desai, Aswini Saith and Sumit Guha. The major point that had to be considered was whether the trend of declining official yield reflected underlying movements in real yield. And here Heston's alternative of constant yield (based on 1951-54 crop cutting yield) for the whole period 1868-1947 for major crops has been found wanting in many respects. Ashwini Saith's careful examination of United Provinces' wheat yield for the period 1840-1946 in Muzaffarnagar and Bareilly districts showed that contrary to an optimistic assessment of rising yield, there was a long term tendency for "intrinsic yield" to decline. This decline was partly offset for a short period due to what Saith calls a "shift effect" - i.e. shift of wheat from unirrigated to irrigated land. (Since irrigated wheat yield was nearly double the unirrigated yield) But once the shift effect had played out its role either with slowing down of expansion of canal irrigation or due to increasing alkalinity due to water logging, the long-term trend of decline in intrinsic yield resumed its course. If there is, as Saith shows, a long term tendency for decline of 'intrinsic yield' then Blyn's figures are not implausible and the alternative of constant yield proposed by Heston is untenable. We are then left with Blyn's series of agricultural production for the period of 1890-1947 as the best and perhaps the most plausible estimation of trend in the key aspects of agrarian production in British India.

Blyn's portrayal of the overall picture of low growth and stagnation strengthens the nationalist argument about the baneful impact of colonial rule while the revisionists could take some consolation from the positive growth trend in the cash crop

production. Yet Blyn's statistics only seemed to deepen some of the paradoxes of agrarian growth. First: how did Indian population grow so rapidly (between 1921-1946) on the basis of a stagnant food grain production? Second: how do we square the fact of rapid agricultural growth in the late 19th century with evidence of recurring famines and scarcities? The answers depend seemingly on the relation between population growth and agrarian production. Were the trends in these two variables independent of each other or was there a causal relation between them? If we accept Blyn's picture we still are left with a huge gap about the trends for most of the 19th century. Were the trends of 1890-1920 a continuation of longer term trends of growth from the 19th century or was there only a brief period of growth within a larger cycle of stagnation and decline initiated in the 19th century?

33.7 THE 19TH CENTURY TRENDS?

What can we say about the longer term 19th century trend as a whole? It may be noted here that Heston's revised output estimates effectively lowers the estimates of the earlier periods and thus instead of a declining trend we are presented a rising trend of output, yield and per capita food grain production, specially for the later half of the 19th century. (Heston 'National InCome' in Dharma Kumar (ed) *Cambridge Economic History of India*). The 19th century trends, in the absence of any series, are at best speculative. Heston's backward extrapolations of the mid 20th century yields are, as we have seen, highly improbable. Sumit Guha, on the basis of scattered evidence, a mix of reliable and highly speculative figures spread across several regions, has estimated that total cultivated area might have increased by 33 percent between 1825-1890.⁵ During the same period the best estimates of population growth range between 26 percent and 87 percent. Only with the lowest estimate of population growth can the acreage growth keep ahead of population.. During the same period he estimates, on the basis of all available crop cutting experiments in the District Settlement reports of North India and South India, a tendency for the yields to decline, though in several regions such as Punjab and United provinces irrigation might have countered this decline to an extent. Combining the trends in acreage, yields and population, Guha estimates a fairly slow growth in output and a decline in per capita output between 1825 -1890.

33.8 SUMMARY

Blyn's production figures based on the official yield and production series, established the following :

- a) Very low rates of growth of agricultural output between 1891-1946. and a strong trend of decline of per capita output.
- b) The relatively brighter performance of non foodgrain crops, while Foodgrain output stagnated. Within foodgrains, rice production declined while wheat production increased at a healthy rate.
- c) There were strong regional variations. Greater Bengal was stagnant while Punjab showed much greater buoyancy.

Agricultural production grew much faster in the first half of our period and stagnated or declined in most regions in the second half. Consequently per capita production increased in the first half and declined most precipitously in the second. Combined with the available trend estimates of the 1825-1890 we can now conclude that the period 1890-1920 represented a brief upward blimp in the overall trajectory of

agrarian stagnation and declining per capita output in the colonial period. The long trend of 19th century stagnation explains the massive mortalities due to recurrent famines in the late 19th century. The stagnant population trend of 1890-1921 and rapid expansion of acreage due to canal irrigation can explain the only favourable period of rising per capita output in the colonial period.

33.9 EXERCISES

- 1) Discuss the main trends in agricultural production in British India over the period 1890-1950.
- 2) What are the main factors for the difference in the performance of foodgrains and non foodgrains crops in the late 19th and early 20th century. Discuss with reference to regional variations.
- 3) Explain the reasons for the inter temporal variations in agricultural production from the late 19th to mid-20th century in British India.
- 4) How does the debate on agricultural statistics enhance our understanding of agricultural production.

33.10 SUGGESTED READINGS

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M.A. History

List of Courses

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