Chapter 3

AGRICULTURAL TRENDS AND PRODUCTION

The magnitude of agricultural output forms the most general determinant of the gross income of an agrarian economy. Though a host of other factors and phenomena intervene to decide its value and the differential distribution of this gross income amongst different classes and regions, trends in crop output describe the basic direction of agrarian economic change. Trends in agricultural output, the pattern of land use, the changing relative acreages of major crops, variations in capital investment and labour inputs between different crop regimes and the costs of cultivation are significant in describing the context in which agrarian history unfolded in the countryside.

This chapter attempts to quantify the various determinants of agricultural output and productivity. The attempt is to provide some indices of agricultural change which can then be related to the other structures of the agrarian economy. These statistics have also been used to check for the existence of fairly distinct garden and wet paddy dominated cropping sub-zones.
within the district. The nature of agricultural economic change suggested by statistical data in this chapter is related to other structures of the Malabar agrarian economy in subsequent chapters. This chapter also tests whether factors such as exhaustion of the land frontier, demographic pressure, technical constraints and inadequate capital investments were responsible for the impasse in which Malabar's agriculture found itself in a given techno-economic and social context.¹

The commencement of the first cadastral survey operations in Malabar as late as the 1890s render the earlier land statistics (when available) of specious quality. In Section I of this chapter some of the available agricultural statistics in the post-Survey period are revised for observable biases and errors on the basis of trends and other corroborative information on these series. Section II deals with the various indices of agricultural change at the taluk level. The attempt is to check whether Malabar's various taluks can be grouped into distinct

zones on the basis of the agricultural trends that they exhibited. Section III discusses the cost of cultivation of garden and paddy cultivation. Section IV is an attempt to understand the output trends observed above.

Section I. Trends in agricultural output
The recorded yield of different crops published in the ASI and the SCR was the end result of a number of estimations carried out at various levels of the colonial revenue collecting machinery. In Madras the area and yield of nine crops - paddy, sugarcane, groundnut, gingelly, castor, cotton, pepper, ginger and senna were reported by the government. Crop acreage referred to the area sown with a particular crop, the area of which varied annually. Standard Yield was the output per acre in an average year on average quality land. The Seasonal Factor or Condition Factor was the proportion of the year's yield to the standard or normal yield which varied from year to year.

The following procedure was followed in Madras for reporting and forecasting crop output. By the twenty fifth of each month the karnum or the village accountant sent a detailed statement of the

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2. The estimating formula used by the Government of India was Output= Standard Yield?X Season Factor X Acreage.
area sown with different crops and the outturn of the harvested crops in his village to the Revenue Inspector who was in charge of a group of villages, representing a normal crop. The Revenue Inspectors aggregated and averaged out the annawari estimates sent by the karnams using their personal experience to make revisions. This was then sent to the Tahsildar who once again repeated the process with the statements from the Revenue Inspectors before it was submitted to the Board of Revenue. The Board of Revenue checked and corrected the final forecasts with the "Returns" or Jamabundy Returns for a series of previous years and the weekly season reports sent by the Collectors and Deputy Directors of Agriculture. The Board then estimated the Condition Factor (CF) using the formula:

\[ Y = \frac{(a_1 \times 1.5) + (a_2 \times 5.5) + (a_3 \times 9.5) + (a_4 \times 12) + (a_5 \times 14.5)}{A} \]

where

- \( A \) - total acreage sown with a crop
- \( a_1 \) - acreage under 0 to 3 annas; \( a_2 \) - acreage under 4 to 7 annas
- \( a_3 \) - acreage under 8 to 11 annas; \( a_4 \) - acreage under 12 annas
- \( a_5 \) - acreage under 13 to 16 annas; and
- \( Y \) - average anna figure reported.

The CF in percentage terms is then calculated as \( Y - 12 \times 100 \), 12 annas being equivalent to the normal or 100.

**Biases and Errors in Official Statistics:**

The above method of yield estimation which has been sharply
criticized by modern scholars such as Heston and Dewey does not evoke much confidence for a number of reasons. Heston has argued that the village accountants had a tendency to underreport the yield and this in turn introduced a downward bias in the reported yield and output figures. Heston's suspicion was also shared by Stuart, the Director of Agriculture, Madras.

In 1919 Stuart revised the normal yield assuming that the Presidency including Travancore and Cochin produced enough for its own needs and that the total annual production would roughly equal the total consumption at the rate of 4 cwt. per head of population, ignoring the fact that Malabar was chronically rice deficit. Panse, who in a survey of Tanjore tried to estimate the viability of eye-estimation for forecasting the output before harvest, found eye-estimates to be 15.4 per cent lower than


4. D.Dis. Revenue, No. 12931/33 dt. 16.11.1935
sample estimates from crop-cutting experiments.\(^5\) Even if there was a tendency to underreport the forecast yield this may not have artificially lowered the reported output below its actual level at least for Malabar, because the Standard Yield was pitched much higher than the actual yield. (The corrected and uncorrected showed a difference of 30 per cent for the CF and about 40 per cent for the yield). The SY was supposed to have been calculated on the basis of crop-cutting experiments on lands of various qualities. The normal yield figures or SY after its last revision in 1919 remained unchanged at 1400 lb. till Independence. It is difficult to believe that Malabar’s SY remained stationary, when determinants of agricultural production such as the intensity of cropping, level of capital inputs, and the proportion of "current fallows" to the gross cropped acreage (hereafter GCA) were declining. In 1935 the Government felt "that steps should now be taken to revise the normal yield figures, so as to ensure their greater accuracy."\(^6\) However, no change whatsoever, was made in Malabar’s normal yield figures till the late 1940s.

\(^{--------------------------}\)


6. D.Dis. Revenue, No.12931/33 dt.16.11.1935
In Malabar yield estimation in wet lands growing paddy, in spite of the perennial nature of its cultivation was plagued by marked biases related to the fertility of the lands. Thomas Shea's survey of 45 wet holdings in three revenue classifications or tarams in 1955 indicated a large dispersion of yields in the lowest classes and much less in the two highest classes.\(^\text{7}\) Yield per acre on 25 holdings in a single crop taram (low yield) land ranged from 100 to 1400 lb. per acre with a coefficient of variation of 41 per cent, whereas on 10 double-crop wet lands in the highest taram the yield ranged between 2800 to 3600 lb. with a coefficient of variation of only 6 per cent. For 10 taram 2 double crop lands the yield ranged between 3000 and 3500 lb. per acre with a coefficient of variation of 4 per cent. Thus, when on inferior lands the yields were fixed with reference to experiments on good lands in paddy rich Palghat and Wallavanad, it systematically "led to lands in other taluks being graded low and charged lower rates than their productivity would warrant."\(^\text{8}\)

Thus, crop experiments conducted by the colonial administration cannot be taken as a reliable aggregate estimate

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of crop yield. In Madras, the Provincial Director of Agriculture was skeptical of the value of the crop-cutting experiments to be representative of an average crop. On the plea that "it is not possible to select an average ten-cent plot which will represent a crop over a considerable extent, in view of the great variations to be found in the same crop over a large tract in a country of small holdings", in Madras "the figures of yield which are solely based on crop-cutting experiments, have never, as stated in the previous report, been wholly depended upon for revising the standard outturns adopted in Madras". The very questionable and arbitrary manner in which the Madras SY was estimated, using unjustified assumptions of consumption and production, does not inspire much confidence.

While being critical of the official data, we do not commit the mistake that Clive Dewey made of first denouncing all colonial agricultural statistics as totally unreliable and then concluding that they can be still be used. Given the problems

9. Quinquennial Report on the Average Yield per Acre of Principal Crops in India for the period ending 1921-22, Calcutta, 1924

associated with the SY series, we have substituted it with a revised SY series based on point estimates (see discussion on pp.135-36).

Coconut Acreage and Output:

While unrevised yield estimates for wet lands inspire little confidence in spite of the perennial nature of cultivation, the yield figures for the ever changing gardens appear of no use at all. In the pre-Settlement years the number of coconut trees in a plot were counted and multiplied by an estimate of average district yield per tree. This procedure was abandoned in 1904. Thereafter any land with more than ten trees per acre was classed as garden land and a tax was levied according to the suitability of the soil to grow to grow coconuts, totally ignoring the life cycle of the trees and their varying bearing capacities. Given these limitations we cannot attempt a serious analysis of garden production although it constituted an important part of Malabar's agriculture.

Statistics of coconut acreage are available only since 1920-21 and the figures for different years are not strictly comparable, making it difficult to determine the trend of coconut
acreage over a long period. Further, no standard yield or Season Factor has been worked out for this crop.

Notwithstanding these problems the Government arrived at figures of the average yield per acre in different areas by ascertaining the number of trees, the proportion of bearing trees and the average yield per tree in a number of gardens and by making personal enquiries. Assuming an average yield per tree for coconuts is hazardous because of the very large annual variation in yield.


12. "In the case of coconuts, however, standard yield have not been worked out, the seasonal condition factor is not reported and there are consequently no official or published figures of annual production. This together with the doubtful accuracy of statistics in respect of acreage referred to earlier, make even a rough estimation of the production of coconuts (and copra, etc.), difficult." ibid, pp.21-22.

13. ibid., "The estimates, therefore have a margin of error and should be taken with due reserve." p.22

14. "Average yield of nuts per tree. Malabar (5 acre garden) 1931 1932 1933 1934 1935 1936 1937 1938 1939 49 34 48 43 41 33 49" The coefficient of variation is as high as 14.9 per cent. ibid, p.27. Another set of figures from the Nileshwar I Agricultural Station were as follows: 1942 1943 1944 1945 1946 5703 6313 5497 8093 5773 with a coefficient of variation
In view of these data limitations we venture only to give estimates of coconut acreage and trees in Malabar. We have estimated coconut acreage for pre-1921 years when there are no direct acreage figures, by multiplying the garden and orchard crop acreages by point estimates of the proportion of coconut acreage to garden crop acreages. Given the absence of SF figures, annual output variations cannot be built into the reconstructed series, as we have done for paddy.

**Yield Estimates of Paddy and Coconuts for Malabar**

A brief recapitulation of some of the available yield per acre estimates for colonial Malabar will give an idea of the of the very broad range of these figure and help to isolate the obviously erroneous estimates. In 1802 the Assistant Collector, Mr Drummond estimated the per acre yield of a double cropped wet holding at 42 bushels or 18.3 paras. The avoirdupois pound equivalent of this comes to 512 or 403 according to the para in

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[cont.]

of 15.1 per cent. *Annual report of the Agricultural Research Station, Pilicode (Nileshwar I) for the year 1951-52 (Fasli 1361), Madras*
Buchanan's own estimate for a double cropped wet holding in Palghat was 18 paras or 396 lb. assuming that the second crop constitutes 60 per cent of the first. An 1861 estimate of yield amounts to 990 lb. for wet lands and 297 lb. for dry lands.

Table 4.1 SUMMARY OF PADDY OUTPUT PER ACRE IN MALABAR

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Crop Type</th>
<th>Output (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1802</td>
<td>Drummond cited in Buchanan</td>
<td>Wet D.C</td>
<td>403</td>
</tr>
<tr>
<td>1802</td>
<td>Buchanan</td>
<td>Wet D.C</td>
<td>396</td>
</tr>
<tr>
<td>1806-10</td>
<td>Warden</td>
<td>Wet</td>
<td>798</td>
</tr>
<tr>
<td>1861</td>
<td>Statistics of Malabar</td>
<td>Wet</td>
<td>990</td>
</tr>
<tr>
<td>1888-</td>
<td>Crop cutting cited by Innes</td>
<td>Wet</td>
<td>1765</td>
</tr>
<tr>
<td>1890</td>
<td>Pattam statement of Zamorin</td>
<td>Wet D.C</td>
<td>1276</td>
</tr>
<tr>
<td>1897</td>
<td>Crop cutting cited in ASI</td>
<td>C.Y</td>
<td>1221</td>
</tr>
<tr>
<td>1906-7</td>
<td>Crop cutting cited in ASI</td>
<td>C.Y</td>
<td>1198</td>
</tr>
<tr>
<td>1914-48</td>
<td>SCR</td>
<td>S.Y</td>
<td>1400</td>
</tr>
<tr>
<td>1951-52</td>
<td>Yield per acre of Principal Crops</td>
<td></td>
<td>938</td>
</tr>
<tr>
<td>1951-52</td>
<td>Average of Crop cutting and</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. In Palghat 1 para is roughly equivalent to 22 lb. while the average weight of the para for the entire district comes to 28 lb. The conversion has been worked out on the basis of the information given in Innes, op. cit., p.264-65.

1955-56 Crop cutting 12
1955-56 Estimates 13
1955 Shea 14

Sources:
1. Buchanan, op. cit., pp. 264-65
2. Buchanan, op. cit., p. 372
4. Statistics of Malabar, p. 4
5. Innes, op. cit., p. 213
7. B.P. No. 4689 dt. 3/8/98, B.O.R. RS & LA
8. ASI, Part II, 1906-07
9. ASI, Part II, 1916-17
11. Quinquennial Average Yield per Acre of Principal Crops in India, 1947-52, I.A.R.I., Delhi, pp. 778-79

"The annual produce of rice in the District may be roughly estimated [sic] at 13,00,00,000 measures (39,500 Garces)...
Taken at 300 measures per acre of wet land and at 90 measures per acre of dry land cultivated with paddy. In Table 4.1 the average per acre output for wet paddy amounts to 1276 lb. per acre in the lands owned by the Zamorin in Ponnani taluk in the...

17. Statistics of Malabar, p. 4
The results of the annual crop cutting experiments for the year ending 30th June 1897 yield a mean value of 241 lb. per acre for the entire district. An average of 1765.5 lb. or 535 Madras Measures per acre for the entire district were estimated on the basis of the "results of 901 experiments conducted in Malabar by the Revenue and Settlement Department during the past sixteen years." In the light of the other estimates the 1897 crop-cutting estimate is clearly a gross underestimate. The ASI gives a figure of 1221 lb. of paddy or 885 lb. of rice as the yield for 1906-07. It was claimed that, "The experiments made during the quinquennium 1901-02 to 1906-07 were more numerous and are believed to have been more accurate than in any of the preceding periods". Subsequently in a note on field experiments older experiments, i.e., those before 1908 were criticized for ignoring soil heterogeneity. It was argued that these were of a perfunctory nature and only since 1908 were systematic manurial, varietal cultural experiments started. The later experiments were based on long, narrow plots as opposed to the earlier 20 cent

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18. "Pattam Statement of the Zamorin", Appendix 4.1
19. Innes, op. cit., p. 213
20. ASI, Part II, 1906-07
The Current Yield figures for rice and paddy for 1916/17 were 868 lb. and 1198 lb. respectively.

Graphs 3.1 (a) and (b) show yield estimate curves based on (a) the point estimates for 1861, 1890, 1916 and 1955 and (b) the official yield estimates from 1914 to 1947.

**Procedure Adopted for Revising Paddy Output**

The official paddy output figures have been revised by correcting the SF and substituting the SY series with a more realistic yield series.

There seems to be little point in correcting the given SF. figure for each year for underestimation when the SY itself had no direct bearing on the district's agricultural productivity. However, the SF needs to be corrected for underestimation if it is used with an estimate of yield which is assumed to be realistic. The SF is supposed to reflect short term fluctuations in output caused by variations in precipitation, timing of the onset of rains, plant diseases, etc. Over a period of say, ten years one can safely assume that bad years would be balanced by good years and the mean SF would represent the normal SF. The SF

Graph 3.1a Yield/acre Paddy
Point Estimates and Trend

Graph 3.1b Unrevised yield/acre of paddy

Source: S.C.R.
figures have been corrected by first dividing the entire period into roughly ten or eleven year periods and calculating the averages. Deviations of the average from 100 are used as correction factors to revise the raw SF series.22

The official paddy acreage has been retained as it shows only a marginal difference of +1.5 percent compared with the Survey and Settlement figure.23 The Resurvey and ASI figures for 1930-31 are identical. In view of the reliability of the acreage statistics no revision has been attempted.

Given the extreme limitations of the SY data a revised SY curve has been fitted to three point estimates of yield per acre which we feel approximate the actual trend in yields most closely. The per acre yield estimates reached on the basis of modern random crop cutting experiments conducted by the Indian Agricultural Research Institute and the Department of Statistics, Madras for 1951-52 and 1952-57 were 938 lb. and 950 lb.

<table>
<thead>
<tr>
<th>Time period</th>
<th>Average SF</th>
<th>Correction Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1902-11</td>
<td>84</td>
<td>1.19</td>
</tr>
<tr>
<td>1912-23</td>
<td>92.3</td>
<td>1.08</td>
</tr>
<tr>
<td>1924-34</td>
<td>94.4</td>
<td>1.06</td>
</tr>
<tr>
<td>1935-42</td>
<td>87.6</td>
<td>1.14</td>
</tr>
</tbody>
</table>

Source for SF is SCR.

23. (Survey and Settlement figure for 1904/5)/ average of 1903-5 =1.46. Calculated from Survey and Settlement Report and ASI.
respectively. We assume 944 lb. per acre to have been the correct yield for 1952. The beginning figure of 990 lb. per acre calculated on the basis of the total output and paddy acreage published in the *Statistics of Malabar* for 1861 has been taken as the correct figure. For the 1890s and the early years of this century the ASI and the yields calculated on the basis of the Zamorin's pattam statement for Ponnani come fairly close to one another - 1221 lb. and 1276 lb. per acre. Taking 1221 lb. per acre as the best estimate of the 1890-1906 period we get a revised SY curve which rises from 1861 to the 1890s and subsequently decreases till 1952. The revised SY (designated ESTY or estimated yield), when multiplied by the corrected SF up to 1915 and paddy acreage gives the revised output series (REVOT). This exercise allows us to construct a more meaningful output trend while being able to preserve the probably real annual oscillations of the raw output series.

This trend of agricultural, or paddy output in the case of Malabar, broadly agrees with George Blyn's findings for India. According to Blyn's estimates per acre food grain yield declined by 0.18 per cent between 1891 and 1941, with the decline becoming
more rapid after 1921. In Malabar, the downturn occurs in the middle of the second decade of the twentieth century. The SY series when multiplied by the Season Factor gives the Current Yield which like the constructed CY series exhibits a secular downward trend. Appendix 3.1 gives the raw and corrected figures for paddy acreage, SF and per acre yield. The declining yield per acre and virtually stagnating output of Malabar's paddy cultivation appear to have been the result of the particular type of agricultural expansion which was at work in Malabar. Graphs 3.2 a, b, and c indicate changes in land use patterns, intensity of cultivation, bulls per acre and the revised output. In the course of the first half of this century we find that 'wet' cultivation lost out to 'dry' crops. Differences in water and topographical requirements between wet paddy cultivation and garden crops did not allow short term substitution between them. However, by filling low lying paddy fields they were made suitable for garden crop, especially coconut cultivation. Graph 3.1 shows that wet paddy lost out to dry crops at a faster rate from the 1920s. This gradual but marked shift in cropping had

Graph 3.2a Malabar Land Use
1894-42

Source: ASI, SCR, SAMP

Graph 3.2b IOC and Bulls per acre

Source: ASI, SAMP

Graph 3.2c Revised Paddy Output

Revot Trend

Source: ASI, SCR, SAMP
Graph 3.2d  Change in dry and wet cultivation ('000s of acres)
significant implications for labour demand in the long run.25

**Capital Inputs**

We take the number of ploughs per acre of paddy and the number of bullocks per acre of paddy as indices of the intensity of capital inputs into agriculture.26 At the district level former improved between 1894 to 1910 then declined till 1920 to recover marginally till 1940. The proportion of ploughs from 1904 to 1940 exhibits a trend similar to the bulls per acre series. Graphs 3.2 b and c indicate a correspondence between the number of bullocks per acre of paddy, the intensity of cultivation and paddy output.

The timing of the sustained downturn in the constructed REVOT series coincides with the fall in capital investments, intensity of cultivation and expansion of cultivation into marginal lands. This lends credence to our constructed output series. The only exception being "Current fallows", which surprisingly registers a marked increase in 1927 to stagnate subsequently at a higher level. The increase is of the order of 60 percent with no

25. See Chapter 6 for changing labour demand.

26. The cattle census was taken every five years before 1884. Between 1884 and 1898-99 it was conducted annually. Subsequently it once again reverted to the quinquennial census. ASI, 1899-1900
proportionate increase in the total, the net or the gross cropped
acreage points to change due to probable reclassification. The
"land not available for cultivation" (NAFC) and "cultivable
wastes other than fallows" (CWOF) series show a simultaneous
downturn at the same time suggesting official reclassification of
some of the NAFC and CWOF categories as "current fallows" (CUFA).

In Malabar during the entire first half of this century the
Net Cropped Area (NCA) registered a rising trend. 27 The NCA
expanded mainly into inferior lands such as cultivable wastes and
cultivable fallows. Lateral expansion at the cost of fallows into
less fertile lands in a context of no technological improvements
points to a situation where one can expect falling yields.
However, as Table 4.2 suggests during the first half of this
century there was no absolute shortage of land for lateral
expansion. The sharp increase in 1931 resulted from the
registration of unrecorded cultivation during the resurvey and

27. On regressing the series CUFA, CWOF, dry land(DRY), wet land
(WET) and NAFC on NCA we get the following results : 

\[ \text{NCA} = \text{CUFA}(-0.673)^* + \text{CWOF}(-0.290)^* + \text{DRY}(0.004) + \\
\text{NAFC}(-0.864)^* + \text{WET}(-1.270)^* + C(3175176.7) \]

R-squared =0.931738  Adjusted R-squared =0.920361
F-statistic =81.89678#
* denotes significance at t0.05
# denotes significant at F0.05
resettlement of the district. The expansion in the 1940s was pioneered by immigrants from Travancore mainly in the Wynad taluk.

Table 4.2 Cultivated Area ('000 acres) and Total Arable

<table>
<thead>
<tr>
<th>Year</th>
<th>Cultivated Area</th>
<th>Percentage Increase</th>
<th>Cultivated Area as percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>1393</td>
<td>-</td>
<td>59.1</td>
</tr>
<tr>
<td>1921</td>
<td>1442</td>
<td>3.5</td>
<td>59.7</td>
</tr>
<tr>
<td>1931</td>
<td>1696</td>
<td>17.0</td>
<td>61.1</td>
</tr>
<tr>
<td>1941</td>
<td>1779</td>
<td>4.9</td>
<td>34.9</td>
</tr>
<tr>
<td>1951</td>
<td>1914</td>
<td>7.6</td>
<td>73.0</td>
</tr>
</tbody>
</table>

Source: Varghese, op. cit., p.123

The twentieth century, especially since the First World War is marked by a falling trend in the intensity of capital inputs into agriculture. The post-War period, was one of agricultural stagnation if not of decline, notwithstanding the lateral expansion in Wynad. This appears to have been preceded by a period of slow agricultural expansion from the 1860s to the first decade of this century. More closely related to paddy productivity is the long term decline in the intensity of cultivation.
Section II Talukwise Trends in Cultivated Area, Cropping Patterns and Capital Inputs

Malabar's taluks can be grouped into garden and wet paddy dominated zones on the basis of the cropping pattern. Absolute figures of crop distribution are given in Appendix 3.2. Annual talukwise cropping data is not available and therefore we have to use statistics published in the SAMP and the Survey. Graph 3.3 below gives the talukwise percentage of paddy and garden land to the GCA. The north Malabar taluks of Kottayam and Kurumbranad were predominantly garden cropped areas. Calicut which formed the border taluk between North and South Malabar was also given to substantial garden cropping. Chirakkal in the extreme north, though containing a substantial proportion of garden grew more paddy. The three southern taluks of Wallavanad, Palghat and Ponnani were predominantly paddy cultivating taluks, with Wallavanad and Palghat being the largest and richest paddy producers.

Graphs 3.4a and b show the talukwise changes in the NCA and GCA between 1904 and 1950. In the 1904 to 1940 period we find a significant increase in the NCA across the garden and paddy zones. In the northern taluks of Chirakkal, Kottayam and Kurumbranad the average paddy acreage as a percentage of the NCA exhibited a secular decline during this period. Garden acreage,
Graph 3.3 Garden and Paddy Acreage
(percentage of G.C.A.)

1904, 1911, 1926, 1939, 1949

Graph 3.4a Talukwise N.C.A.
1904 – 1939

Graph 3.4b Talukwise Change in G.C.A.
on the other hand, increased till the onset of the Depression and then dramatically slumped, to again increase in the post 1930 years. By 1950-51, in acreage terms paddy ranked first followed by "oilseeds", "fruits and vegetables" and "spices and condiments". Among oilseeds "coconuts occupied a major portion of the extent under cultivation." Thus if one aggregates the above crop categories the trend towards garden cropping at the cost of wet paddy cultivation immediately becomes clear.

In Calicut the NCA, paddy and garden cultivation expanded between 1904 to 1925. In the 1925 to 1930 period while NCA continued to rise, garden and paddy acreage fell. In the 1930 to 1939 period NCA continued to rise while garden acreage rose slightly and paddy acreage registered a small fall. Wallavanad showed an increasing NCA between 1904 and 1930 with paddy and garden moving in opposite directions. The post 1930 years showed a small decrease in cultivated area. Palghat taluk exhibits a trend in cropping pattern not shared by the others. In the first period the NCA increased but its major crop, paddy, shrunk in acreage terms. In the 1925 to 1930 years the NCA declined but paddy expanded. Finally, from the Depression to the end of the

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29. ibid.
War the NCA decreased (See graph 3.4a).

On disaggregating the district’s changes in cultivated acreage we find that while almost all the taluks shared in the expansion of cultivation in the 1920 to 1930 period, the Depression impacted differently upon the NCA in the northern and southern taluks. While the NCA continued to expand in the north, all the southern taluks registered negative changes in NCA between 1930 and 1939. This trend continued till the end of our period in 1950-51. An interesting case is that of Wynad. From 1930 to 1950 Wynad registered an exceptionally fast expansion of cultivation stimulated by large scale Christian immigration from the Travancore region.

At the taluk level we find that while in North Malabar on the average the number of ploughs per net cropped acre constantly declined, in South Malabar the situation improved in Walluvanad and Ponnani from 1910 to 1920 (in spite of increasing NCA) to decline subsequently. In Palghat the number of ploughs could not keep pace with the sharply rising NCA in the 1910 to 1920 period. The slower rate of increase in the NCA in the 1920 to 1939 years saw the proportion of ploughs to NCA recover but fell short of the 1910 level. (See Graph 3.5)

In terms of the number of NCA per cart, once again the paddy rich taluks of South Malabar were much better off than the North.
On an average for the whole district, the number of carts in relation to the NCA declined during the brisk expansion of cultivation in the 1910-20 decade, Palghat and Wallavanad being notable exceptions. The 1930-40 decade again saw a similar decline in capital stock. However the magnitude of decline was much less in the South vis-a-vis the North. The figures have been based on NCA because ploughs and cattle were

The intensity of capital stock in Malabar's agriculture thus exhibits a rise from 1904 to the mid 20s followed by a decline till 1939-50, a trend similar to the output curve for paddy. The clearly discernible regional disparity in the size of capital stock between the North and the South persisted during the first half of the 20th century, but from the 1920s a pervasive fall in the intensity of capital use is observed in the paddy rich South also.

It should be pointed out here that the population pressure on cultivated land was greater in the Northern taluks than in the South. 30

30. The average population per cultivated acre was 2728 in the three northern taluks while it was 2498 in the four southern taluks. If Calicut is aggregated with the southern taluks the difference increases. Computation based on SAMP, 1927, p.9
SECTION III Cost of Cultivation

Unlike South and Central Malabar the taluks of North Malabar were predominantly devoted to garden crop cultivation. The chief garden crops were coconut, betel nut, pepper, jack and other fruit trees. The gestation period for these crops was much greater than that for cereal crops. The initial capital investment required for garden crops during the period of gestation was greater than that for seed land. Much more personalized attention was required for rearing garden crops vis-a-vis paddy. The risk factor in garden cultivation is also very great as these plants and trees are extremely susceptible to high velocity winds, pests and lightning.

The raising of pepper wines, in addition to the above operations requires the growing of standard trees to provide supports for the vine. Even after becoming productive further costs have to be incurred by the cultivator. Labour for gathering of crop constituted ten per cent of the cost of the total produce. The pepper vine is exceptionally prone to destruction by drought. Though the vine bears fruit after the fourth year, earlier than other garden plants, produce of the crop violently fluctuates, unlike other crops, from year to year.

Throughout the course of British rule in Malabar, officials
repeatedly calculated and revised the cultivation costs incurred in paddy and garden production. In an 1801 survey Strachey and Brown, in order to emphasize the continuous meticulous care needed for garden cultivation refer to the fact that "...property of this description devolving to minors, women or indigent persons, frequently goes to decay." 31

"During the period of rearing the trees, and afterwards the charges of cultivation of the soil are more than of the same extent, of seed land. The first must be hoed while the latter is ploughed." 32

The price of the latter seed land varies according according to the exposition and soil from 4 to 800

4 to 800 fanams for every 100 dangayas of seed; but the settled price of the former, even before the invasion of Hyder Ali, when no land revenue was known, was only 100 fanams for an equal extant. It thence appears in the opinion of the natives founded of course on


experience, the agency of man requisite for tree produce, compared to that required for grain is at least 4 to 1 as 8/10 and that of the soil only to 2/10. But admitting it to be but 6/10, what remains after reimbursing this agency can only with wisdom of justice, be looked on as a fund for revenue." 33

The care and expenditure needed for garden cultivation vis-à-vis' paddy production was remarked upon by various colonial commentators. However, modern cost surveys do not vindicate their view. For instance, the experience at the Taliparamba Station in the 1920s showed that 'it would cost about 150 rupees to bring an acre of pepper garden from planting to the bearing stage. The annual recurring expenditure is comparatively little.' 34

Paddy cultivation costs were estimated and revised repeatedly. Mr. Warden's Proclamation of 1805 used the traditional customary rate-- i.e. calculating the cost of cultivation at twice the quantity of seed required on any given

33. ibid.

34. M. Govinda Kidavu and P.A. Venkateswara, Pepper cultivation on the West Coast, Madras, 1929, p.8
piece of land as the cost of cultivation. In the 1880s Logan estimated the cost at roughly 3.5 times the seed required.

An acre of first crop paddy required 50 edangalis of seed and an equivalent of 178 edangalis were required for other expenditure. For the second crop, the seed required was 60 edangalis and other expenditure came to 158 edangalis.

Mr Moberly, the Settlement Officer of the first Malabar Survey and Settlement at the beginning of this century estimated the cost of cultivation of the best class of land at Rs.12-8-0. Of this 55.6 per cent or Rs.6-15-3 represented cash expenditure and the rest was incurred in kind (203 edangalis). The aggregate cultivation cost amounted to 7 to 8 times the quantity of seed required. Detailed distribution of cultivation costs under different heads from the time of planting to maturity was prepared for the Government to be used in settling suits for compensation under the M.C.T.I.A in 1910. The Raghavayya Committee estimated the cost

35. Report of the Special Officer for the Investigation of Land Tenures of Malabar, May 1947
36. ibid.
37. ibid.
38. See No.808, Judicial, 25th February 1910

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cultivation at 2.5 times the seed required. Finally the Special Officer for the investigation of Land Tenures in May 1947 recommended 20 Palghat paras to be adopted as the cost for cultivating one acre of paddy.

The more reliable later cost of cultivation estimates for garden and wet paddy, clearly suggest that latter was much more expensive, needing a much greater amount of labour. This may have been one reason, among others for the long term trend of displacement of wet cultivation by dry cropping.

Section IV Explaining Agricultural Output Trends

Here we give a brief outline of the various factors which constrained and subsequently lowered agricultural productivity in Malabar. Commodity production in agriculture predated British rule in Malabar. The logic of profit and the continued dominance of non-profit forms of exploitation and subsistence agriculture

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39. ibid.
40. ibid.
41. The distribution of inputs in Rs per hectare for coconut and paddy cultivation estimated by the National Sample Survey shows total inputs and labour inputs (both family and hired) to be 56.4 and 158.3 percent higher respectively for paddy when compared to coconut cultivation. National Sample Survey, 1950-51.
provided the setting for the unfolding of economic change in the Malabar countryside.

One reason for the fall in productivity appears to have been the increase in small holdings and some disengagement of large farmers from paddy cultivation.\(^42\)

The unchanging level of available technology has often been faulted for the impasse in which Indian agriculture found itself.\(^43\) For Western India, it has been argued that productivity enhancing investments were not made because there were none left.\(^44\) In Malabar it appears that even the limit of available technological inputs had not been reached. Malabar agriculture also did not exhibit any innovations in crop rotation, use of high yielding varieties of seed and newer fertilizers or better means of irrigation. In theory it is possible to surmount the technological barrier by changing cultivation practices. But these unfortunately were not cost neutral. All observers of rural

\(^42\) This theme is dealt with in detail in Chapter 5.

\(^43\) Sumit Guha, \textit{op.cit.}

\(^44\) Sumit Guha, \textit{op. cit.}, pp.195-196. For a diametrically opposed view which argues that even available technological resources were not employed, see Vasant Kaiwar, 'Property structures, demography and the crisis of the agrarian economy of colonial Bombay' in David Ludden, ed., \textit{Agricultural production and Indian history}, Delhi, 1994.
Malabar, from Buchanan in the early nineteenth century to Adrian Mayer in the 1940s remarked on the inadequacy of manures used. According to Buchanan, "Ashes and cowdung are carefully collected for manure and the latter is preferred when dry and rotten. The quantity is therefore very small, as nothing is mixed with the dung, to rot and increase its bulk." Subbarama Aiyar in his survey of Nelluvaya village in 1920 found that the ryot did not hesitate to apply scientific manures, but cost and doubts about its long term profitability prevented him from using them. Green manure was used but with time even that became very scarce. Once again we find mention of inadequate manuring in Adrian Mayer’s account of Malabar agriculture. "That the land receives only insufficient manure may be seen from the fact that in Guruvayur (1937) only 900 tons served acreage needing 1,800 tons. In Erimayur a large land owner was using 10 cart-loads per acre, when he estimated that the optimum amount was 12 cart-loads. Such heavy manuring is rare; however, it may be added that the yield, since the land has thus been manured, had risen from 70 to 120 paras. The short supply of manure is being further

45. Francis Buchanan, A journey from Madras through the countries of Mysore, Canara and Malabar, Madras 1870, Vol.II, p.380

46. S. Subbarama Aiyar, Economic Life in a Malabar Village, Bangalore, 1923
reduced by the settlement of what were previously uncultivated lands producing green manure."

This brings us to the question of investment in agriculture. Productivity increases were dependent on farmers investing the returns from one agricultural cycle in the next. Investment levels were constrained by factors such as rent, revenue, movements in prices and yield and government support. Both direct and indirect state help to improve the investment climate in the Malabar countryside were virtually nonexistent. Comfortable in their belief that Malabar was blessed with a copious rainfall the Government took no step to provide irrigation. Of the four divisions of the Madras Presidency, the West Coast had the highest debt per acre of Rs 65. In Malabar loans were incurred not so much on account of expenses related to marriages, childbirths and other kinds of conspicuous consumption, but to continue from one agricultural cycle to another. "Only those who can find money from other sources like trade, public life,

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[cont.]

47. . ibid.


49. . "To a casual visitor, Malabar with its evergreen appearance gives a very false impression, viz., that it had

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contract, etc. ever think of improving their lands." In spite of the cruciality of credit in agriculture and its acute shortage, the government's role as a supplier was negligible. In a sample survey government and cooperative credit accounted for only 1.6 percent of the total volume of credit. State aid to agricultural investment in Malabar was clearly of little significance.

While state aid was insignificant, non-profit incomes in the form revenue and high rent and associated levies had a direct impact on agricultural incomes and investment. Graph 3.6 clearly shows that in the course of the first half of this century the real land revenue demand declined till 1920, increased slightly till 1930 under the impact of falling prices to shoot up dramatically after 1930. The sharp post-1930 rise was set off by the increased revenue demand at the Re-settlement and falling prices. Although the maximum increase in revenue demand was 18.75 percent, the real increase in revenue demand was many times the enhancement because of the reclassification of land. The water in abundance and that there is no necessity to provide any irrigation facilities for cultivation. But those who are personally acquainted with the condition in Malabar know that though Malabar is blessed with a copious rainfall... the rains often fail at the proper time and the crops wither." Report of the Malabar Tenancy Committee, vol.I, 1939, Madras, 1940,
large hike in the number of distrants and use of coercive procedures to realize revenue is evidence of the unbearable weight of land revenue in the years of depressed prices. The total number of processes issued in 1929-30 (21808) increased by more than a 100 per cent to 44,883 in 1930-31. Very often the land sold for revenue arrears had to be bought by the government for want of bidders. This sharp increase in revenue prompted the landlords to pass on most of the increase to the tenants.

Unlike the carefully recorded movement of land revenue, movements in rent are much more difficult to quantify given the wide variations from farm to farm and the variety of non-monetary levies. Scattered rent quotations, figures of eviction and the timing of government legislation to ensure fixity of tenure give an idea of the broad course taken by rent. A quantitative analysis the relationship between output and rent on the Zamorin’s lands in Ponnani exhibited a clear inverse relationship between the two variables.

Where tenurial and agrarian relations were more in favour of the cultivator one can logically expect such productivity

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[cont.]

p.15.

increases to take place. In a context where the bulk of the cultivators were tenants with extremely tenuous rights to their plots, they had to be sure that any improvement made by them would be compensated for by the landlord. Thus one would expect to find increasing agricultural productivity and a greater intensity of capital inputs in the less unequal garden cropped taluks than in the wet paddy growing South. This hypothesis comes fairly close to Ludden's typology of agricultural productivity in the dry and wet areas. Except for agricultural productivity, all the other characteristics of the wet and dry lands enumerated by Ludden overlap with those delineated by us for the garden and wet zones.

The data on capital inputs and indices for paddy output however does not support this hypothesis. The level of capital investment continued to be at a much lower level in garden cropped North Malabar compared to the wet paddy growing South. It actually declined in the north while it either remained constant or increased in the South. This appears to be related to nature of agrarian expansion. In the North small holders were the main force behind the expansion in cultivated area. Here we also find janmis to be less powerful than in the South. Between 1917 and 1926 when agricultural product prices rose all agricultural groups increased their cultivated area.

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[cont.]
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In the garden dominated taluks of Kottayam and Kurumbranad in the North, kanamdars and kuzhikanamdars gained at a faster rate than the janmis while the reverse was the case in the paddy dominated areas of Chirakkal taluk and the South.59

While it is true that the small peasant and the kanamdar could extend their control of cultivated land in response to market incentives faster than the janmis in the North, this did not lead to anything other than lateral expansion. Investment not only could not keep pace with the extension of cultivation, but actually declined in absolute terms.

Both the models of profit maximizing small peasants of the North and that of the purely rentier janmi need to be revised. Both the small farmer and the janmi tended to contribute to a positive supply responsiveness in agriculture during times of price increases, but only the better endowed rural magnates could continue to respond to the market by cutting down investment in times of a price decline unlike the small peasant. Landlord dominance, per se, did not inhibit investment and productivity as evidenced by the experience in Palghat taluk. The level of investment was greater in the landlord dominated wet paddy taluks than in the less skewed garden cropped areas of the North.

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[cont.]

51. Written evidence of M.R.Ry Giriappa Avargal, B.A.,
However, landlord exactions and monopoly of better quality land, enervated the cultivating small holder so that even when they got the opportunity to come into land they were severely constrained by lack of capital.

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[cont.]


57. Report on the settlement of the land revenue of the districts in the Madras Presidency for fasli 1338

58. Output= Extent x 372.717 + Rent per acre x -4.213+ [4.657] [-1.491]*
   Constant x 49.516
   Adjusted R2= 0.648 * Significant at t 0.10
   Figures in brackets are t-statistics
Based on figures compiled from the Pattam statements of the janmam lands of the Zamorin, Pallapram amsam, Ponnani taluk

59. See Chapter 6

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## Appendix 3.1 Paddy Output Data

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<td>NA</td>
<td>1400.000</td>
<td>967.0916</td>
<td>NA</td>
</tr>
</tbody>
</table>

**PAC:** Paddy acreage  
**SF:** Uncorrected Season Factor  
**SFCO:** Corrected Season Factor  
**SY:** Standard Yield  
**ESTCY:** Estimated Current Yield  
**REVOT:** Revised paddy output in tons