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# "AGRICULTURAL WAGES IN INDIA"—A RELIABILITY ANALYSIS

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## INTRODUCTION

"Agricultural Wages in India"—an annual publication of the Directorate of Economics and Statistics, Ministry of Food and Agriculture, Government of India being issued since the year 1951-52—is possibly the only published source available to researchers for continuous and comprehensive data on agricultural wages. Sources such as Agricultural Labour Enquiries and the Studies in Economics of Farm Management, which are the other important sources, provide wage data only for particular years or locations. The position with respect to wage data was very unsatisfactory in the period prior to the 'fifties, and the starting of the Directorate's publication can rightly be regarded as one of the major products of the systematic efforts made over the last two decades for improved availability of data on agriculture and rural economy.<sup>1</sup> On this background, it may appear a little surprising that the use of this source by the researchers has not been as extensive as one would expect; a quick perusal of the recent literature revealed only two substantive studies based on the AWI data (see the Appendix of this paper). While this may in part be due to the fact that the themes relating to agricultural wages have not figured as prominently in recent researches as certain other themes, it would also appear that researchers prefer to turn to alternative sources of data on agricultural wages whenever possible or take up only such studies as are facilitated by these alternative sources.<sup>2</sup>

The reasons for this reluctance on the part of researchers to make extensive use of the AWI data need to be sought in the manner in which these data are collected and compiled. While the scheme took a welcome step towards collection of wage data on a uniform basis in all the States by introducing a standard proforma to be filled in monthwise, it should be obvious that the scheme is open to doubts and misgivings on a number of scores.<sup>3</sup> Firstly, the scheme specifies that "the wages reported should be those *most commonly*

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1. See "Agricultural Statistics in India," N.S.R. Sastry, *Indian Journal of Agricultural Economics*, Vol. I, No. 1, July, 1946, pp. 28-36. Referring to the availability of statistics on agricultural prices, wages, land values, etc., Sastry describes the position as "unsatisfactory" and adds "some data, though, defective is available for prices but, with regard to other factors, there is absolutely no information worth the name." For brief historical comments on collection and compilation of agricultural wage data prior to 1951-52, see "Relative Movements of Agricultural Wage-Rates and Cereal Prices: Some Indian Evidence," Nilakantha Rath and R. V. Joshi, *Artha Vijnana*, Vol. 8, No. 2, June, 1966, pp. 115-132.

2. See the Appendix of this paper for a description of studies turning to alternative sources of wage data which are seen to be Agricultural Labour Enquiries and Farm Management Surveys.

3. It is only fair to admit that our comments on the AWI scheme are based entirely on the short description of the scheme published as an appendix in "Agricultural Wages in India." It is possible that the Directorate issues more detailed instructions and lays down more elaborate procedures for collection of wage data which are not covered by the short description relied on by us.

*current* during the month” and that “cash wages as well as the equivalent of wages paid in kind and their totals in cash equivalent should be given.” Nothing further is said in the scheme to define more concretely the meaning of the term “most commonly current wages,” to lay down rules for imputation of value to wages in kind and to indicate the respondents from whom the data are to be collected (farmers who pay wages, labourers who receive them or knowledgeable persons in the village, etc.). Secondly, while the scheme requires that the data be collected from each district, the decision on the number of villages to be selected and the procedure of selection is apparently left entirely to the collection agency in each State or district. Thirdly, the scheme is implemented not by a staff trained for the purpose—not even by a staff whose major function is collection of rural data—but by revenue officials at village and taluka levels or by non-officials like presidents of local boards and primary school teachers.

In the light of these features of the scheme, it should be pardonable for a researcher to have doubts about the precise concept of wage used in the scheme, about the representativeness of the villages and respondents providing the data and, more broadly, about the seriousness, efficiency and regularity with which the scheme functions at the primary level—the level most crucial for ensuring reliability of data. While it is reasonable to have such doubts, it does not follow that the data collected by the scheme can fairly be judged as unreliable and non-usable on the basis of such doubts alone.<sup>4</sup> There are at least two important considerations which, in our view, should suggest an approach to these data which is more constructive than that of outright rejection. Firstly, the mode and agency of collection of the AWI data are similar to those of data on diverse aspects of agriculture and rural economy available on a continuous basis.<sup>5</sup> It is unlikely that in the foreseeable future all these data could be arranged to be collected through agencies like the National Sample Survey (NSS) and Agro-Economic Research Centres having competence—in terms of staff and facilities—to collect data on the basis of rigorously formulated concepts and statistical designs. It would, hence, be a luxury which a researcher can ill-afford to treat all such data as being outside the pale of acceptability. Secondly, it is our submission that precision and reliability of data require costs to be incurred and, hence, the question of quality of data to be used in a research needs to be judged in the light of the purposes of research and costs of data collection. It is difficult to believe that under

4. Consider, for example, the *anna-wari* system for collection of crop production statistics which was replaced during the 'fifties by crop-cutting surveys. The former system was open to serious objections as a scientific procedure for collection of data and, yet, researchers who have compared the output of two systems do not find the *anna-wari* data to be unworthy of research use. See “Comparison of Yield Estimates Prepared on the Basis of Traditional and Crop-cutting Methods,” C. H. Shah, *Indian Journal of Agricultural Economics*, Vol. XVII, No. 4, October-December, 1962, pp.33-39 and the exchange between V.G. Panse and Shah in the same *Journal*, Vol. XVIII, No. 2, April-June, 1963, pp. 33-42.

5. A reference to publications like “Guide to Current Agricultural Statistics” (Revised Edition), Directorate of Economics and Statistics, Ministry of Food and Agriculture, Government of India, 1962 would show that the data collected by specialised agencies on the basis of scientific procedures constitute a small, though growing, part of the available agricultural statistics.



a rational scheme for use of data in research the data like the AWI data, possibly the cheapest in terms of costs of collection, would be found to have negligible research worth.

The purpose of this paper is to examine the AWI data from two related points of view. The attempt, firstly, is to discover research issues in the investigation of which the use of these data would appear to be valid and, secondly, to suggest improvements in the AWI scheme bearing in mind the constraints characterizing such schemes depending on routine administrative departments for collection of data. Both these purposes would need a more concrete pinpointing of the specific deficiencies in the AWI data than is possible by merely considering the broad features of the scheme described earlier above. There are three possible approaches for doing this. The direct approach would be to evaluate the working of the scheme, especially at the level of collection, in terms of the characteristics of the agencies and procedures through which the data are collected and the care and speed with which they are scrutinised and compiled for onward transmission. The two indirect approaches, more suitable for individual researchers to adopt, are: (a) to discover the deficiencies in data by using them in trial analyses relating to regions and periods either covered in the past researches in the area or which suggest specific plausible hypotheses regarding wage-behaviour, or (b) to discover the deficiencies by comparing the variation in the AWI wage data—cross-sectionally or over time—with the corresponding variation shown by data drawn from more acceptable sources of information on agricultural wages.

This paper is based on the last of the approaches mentioned above. The next section contains the findings of comparison of the AWI data with the wage data available in National Sample Survey Report No. 33—"Wages, Employment, Income and Indebtedness of Agricultural Labour Households in Rural Areas"—based on the Eleventh and Twelfth rounds covering the period September, 1956 to August, 1957. The purpose is to find out the closeness of the level and variation of the two sets of wage data *over the ALE zones*—the smallest areal units for which the NSS data are available in the published report.<sup>6</sup> The Studies in the Economics of Farm Management (SEFM), being published by the Ministry of Food and Agriculture since the mid-'fifties, constitute the other source of wage data made use of in this paper. They contain monthwise data on agricultural wages based on sample investigations conducted in selected districts for selected years. We have used these data to assess the extent to which the AWI data fail to reflect the seasonal variations in wages, a point of frequent criticism against the latter data (see the Appendix of this paper). The relevant findings are presented in section III.

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6. The NSS stratified rural India into 38 ALE zones with each zone consisting of a number of contiguous districts regarded as being relatively homogeneous with respect to characteristics of wage employment in agriculture.

It will be noticed that for the purpose of comparative analyses we have treated the NSS data or SEFM data, as the case may be, as being sufficiently reliable to serve as norms to discover the deficiencies in the AWI data. This is, of course, the major assumption made in this paper. It appears to us to be a very plausible assumption to make since, as pointed out above, researchers have shown marked preference in their work for the NSS and SEFM wage data and, more importantly, since the NSS and SEFM are two among the most ambitious programmes implemented in the country to date to collect scientifically data on agriculture and rural economy. However, reliance on such an assumption is unnecessary if one were to adopt the second approach noted above for evaluation of the AWI data, *viz.*, to carry out trial analyses using these data for regions and periods for which plausible hypotheses regarding wage-behaviour exist in the literature. While this approach is not adopted in the present paper, we briefly summarise the findings of some recent studies on agricultural wages in the Appendix to lend a helping hand to those who may want to pursue further this line of investigation.

## II

### COMPARISON OF AWI AND NSS WAGE DATA

The NSS data used in this section are those contained in Tables 7 and 8 (pp. 107-110 of the NSS Report referred to above). Table 7 shows for each ALE zone the average daily wage (in annas) of *casual adult male* agricultural labourers by type of operation over the year September, 1956 to August, 1957; the operations distinguished for this purpose being 'ploughing,' 'sowing,' 'transplanting,' 'weeding,' 'harvesting,' 'other agricultural operations,' 'all agricultural operations,' 'non-agricultural operations' and 'all operations.' Table 8 presents the data in the same format for *casual adult female* agricultural labourers. Comparable tables were worked out by using the AWI data relating to the months September, 1956 to August, 1957 collected from the issues of "Agricultural Wages in India" for the years 1956-57 (for the months September, 1956 to June, 1957) and 1957-58 (for the months July and August, 1957). The ALE zones in the comparable tables were formed on the basis of Appendix II of the NSS Report showing the composition of ALE zones in terms of the districts falling within each zone. As regards the calculation of the zonal wage from the AWI data, the only practicable course was to work out simple averages (average of the twelve monthly wages in each village to get the village wage, average of the village wages to get the district wage and average of the district wages to get the zonal wage). While this procedure is a little unfair to the AWI data since the appropriate weighted averages could have given a better chance to them to do well in the comparative analysis, it needs to be remembered that often simple averaging is the only way that a researcher can manage to use the AWI data in practice.<sup>7</sup>

7. Among the studies on agricultural wages that we consulted (see the Appendix), only one (N. Krishnaji's) makes a limited use of weighted averages to go from district averages to State average. *Vide* "Wages of Agricultural Labour," *Economic and Political Weekly*, Vol. VI, No. 39, Review of Agriculture, September 25, 1971, pp. A-148—A-151. All other studies, whether based on the AWI data or not, appear to use simple averages.

Some of the difficulties met with in constructing the comparable tables from the AWI data may briefly be mentioned. The AWI data did not cover all the ALE zones included in the NSS data; it was found that out of 38 zones figuring in the NSS data comparison was possible for 29 zones. Another restrictive factor was that the AWI data were available operationwise only for a few States which further reduced the number of comparable zones for operationwise wages. The number of comparable zones and the type of the available AWI data in each State are shown in Table I.

TABLE I—ALE ZONES PERMITTING COMPARISON OF NSS AND AWI WAGES

State			Number of ALE zones	Number of comparable zones	Type of AWI wage data	Remarks
Uttar Pradesh ..	..		4	4	B	—
Madhya Pradesh ..	..		6	6	B	In Zone No. 1 AWI data exclude Gird district.
Bihar .. ..	..		3	3	A	
West Bengal ..	..		2	2	A	In Zone No. 2 AWI data exclude Purulia district.
Orissa .. ..	..		1	1	A	
Assam, Manipur and Tripura			2	—	A	AWI data omit many districts. Hence, both the zones excluded from the analysis.
Andhra Pradesh ..	..		3	2	A	AWI data exclude districts in Zone No. 3. This zone excluded from the analysis.
Madras .. ..	..		1	1	B	
Kerala .. ..	..		1	1	A	
Mysore .. ..	..		2	2	A	AWI data exclude Bidar, Gulbarga and Raichur in Zone No. 1 and Coorg in Zone No. 2.
Bombay .. ..	..		6	6	A	
Punjab, Delhi and Himachal Pradesh			2	1	B for Punjab A for Himachal Pradesh	Zone No. 2 had to be excluded since information of uniform type is not available for all districts.
Rajasthan .. ..	..		4	—	A	Only one district from Rajasthan figures in AWI data.
Jammu & Kashmir ..	..		1	—	—	The State does not figure in AWI data.
Total .. ..	..		38	29		

Note : A = AWI wage data available under the broad headings "Field Labour" and "Other Agricultural Labour."

B = AWI wage data available operationwise though the headings are not uniform from State to State.

Let us now turn to the findings of the comparative analysis. We report them in terms of twelve sets of comparisons (6 operations  $\times$  2 sexes) with each set consisting of a number of ALE zones. As regards the level of wages, it was clearly evident that the AWI wages tend to be higher than the NSS wages by a sizable margin of about 30 to 40 per cent of the latter wages (see Table II). It can also be seen from Table II that the tendency for the AWI wages to be in excess of the NSS wages is true of all the sets of comparisons and, with few exceptions, even of individual ALE zones as can be checked from the last column in Table II. Some additional evidence on this point is contained in Tables III and IV which show, respectively, at the State and the zone level the AWI wage in relation to the confidence interval of the NSS wage. These tables are based on the limited information on confidence intervals contained in the NSS Report. It is needless to add that the AWI wages close to or in excess of the *upper point of the interval* would be an even stronger evidence of the element of over-statement in the AWI wages than the evidence provided by Table II. It can be seen from Tables III and IV that this is true of most of the comparisons contained in these tables. It would seem reasonable to conclude in the light of Tables II to IV that the tendency for over-statement noticed in the AWI wages is a characteristic of the entire AWI scheme and, hence, explanation for it needs to be framed in terms of some pervasive features of the scheme rather than in terms of lapses on the part of the personnel collecting data or specific peculiarities of wage situations in different regions.

TABLE II—OPERATIONWISE WAGES FOR MALE AND FEMALE LABOUR

					Number of comparable zones	Average wage (in annas)		Ratio of AWI to NSS	Number of zones in which AWI wage exceeded NSS wage		
						NSS	AWI				
Wages for male labour											
Ploughing	..	..	..	12	15.8	20.0	1.3	10	out of	12	
Sowing	..	..	..	5	20.3	21.9	1.1	4	out of	5	
Weeding	..	..	..	12	13.4	17.5	1.3	11	out of	12	
Harvesting	..	..	..	12	16.6	23.2	1.4	10	out of	12	
Field labour		..	..	17	16.8	22.4	1.3	17	out of	17	
Other agricultural labour	..			29	15.7	20.3	1.3	27	out of	29	
Wages for female labour											
Ploughing	..	..	..	5	10.4	12.4	1.2	4	out of	5	
Sowing	..	..	..	4	9.7	16.7	1.7	4	out of	4	
Weeding	..	..	..	11	9.2	12.4	1.3	11	out of	11	
Harvesting	..	..	..	12	12.0	16.8	1.4	10	out of	12	
Field labour	..	..	..	17	12.2	16.1	1.3	17	out of	17	
Other agricultural labour	..			28	10.5	14.2	1.4	27	out of	28	

TABLE III—STATEWISE COMPARISON OF AWI WAGE WITH THE CONFIDENCE INTERVAL FOR NSS WAGE

*(wages in rupees)*

State	Confidence interval for NSS wage	NSS wage	AWI wage
<b>Wages for male labour in ploughing</b>			
Uttar Pradesh .. ..	0.77 to 1.10	0.94	1.09
Madhya Pradesh .. ..	0.61 to 1.04	0.80	1.10
Madras .. .. .	0.75 to 1.10	0.91	1.58
Punjab .. .. .	1.68 to 2.39	2.08	2.42
<b>Wages for male labour in harvesting</b>			
Uttar Pradesh .. ..	0.92 to 1.17	0.97	1.06
Madhya Pradesh .. ..	0.69 to 0.96	0.89	1.19
Madras .. .. .	0.77 to 0.84	0.81	1.13
Punjab .. .. .	1.25 to 3.30	2.47	3.09
<b>Wages for male labour in all agricultural operations</b>			
Uttar Pradesh .. .	0.90 to 0.95	0.92	1.09
Madhya Pradesh .. ..	0.72 to 0.80	0.76	1.08
Madras .. .. .	0.76 to 0.95	0.84	1.06
Punjab .. .. .	1.54 to 2.46	1.98	2.28
Bihar .. .. .	0.88 to 0.93	0.91	2.10, 1.26
West Bengal .. ..	1.27 to 1.54	1.43	1.67, 1.65
Orissa .. .. .	0.72 to 0.86	0.80	0.98, 1.07
Assam, Manipur and Tripura	1.44 to 1.68	1.54	2.40, 2.32 in Assam 2.00, 2.00 in Tripura
Andhra Pradesh .. ..	0.83 to 0.92	0.87	1.25, 1.17
Kerala .. .. .	1.19 to 1.38	1.28	1.38, 1.39
Bombay .. .. .	0.85 to 0.90	0.87	1.46, 1.35
Mysore .. .. .	0.78 to 0.89	0.84	1.37, 1.33
Himachal Pradesh ..	1.54 to 2.46	1.98	2.43, 1.82

*Notes:* (1) This table is based on Tables E.1.7 to E.1.9 (pp. 133-135) given in the NSS Report. These tables present the four sub-sample estimates with the property that "the minimum and the maximum of the four sub-sample estimates provide, for the characteristic estimated, an 87.5 per cent confidence interval, that is, the probability of the true value of the characteristic being included between the two limits is 0.875." (p. 123 of the NSS Report.)

(2) In the part of the table relating to "All agricultural operations," the AWI wage shown for the first four States is the wage for "Other agricultural labour." For the other States, the first entry in the column AWI wage relates to "Field labour" and the second to "Other agricultural labour."

TABLE IV—ALE ZONEWISE COMPARISON OF AWI WAGE WITH THE CONFIDENCE INTERVAL FOR NSS WAGE

(wages in rupees for male labour)

State	ALE zone number	Confidence interval for wage in all agricultural operations	NSS wage	Range of operationwise AWI wage	AWI wage for field labour	AWI wage for other agricultural labour
Uttar Pradesh	1	0.65 to 0.98	0.84	0.59 to 0.99	—	0.65
	2	0.67 to 0.84	0.78	0.73 to 0.97	—	0.88
	3	1.00 to 1.11	1.04	1.21 to 1.43	—	1.31
	4	0.64 to 0.98	0.90	1.24 to 1.50	—	1.27
Madhya Pradesh	1	0.68 to 1.26	1.03	1.20 to 1.50	—	1.09
	2	0.73 to 1.00	0.90	0.91 to 1.36	—	1.11
	3	0.66 to 1.02	0.86	0.72 to 1.13	—	1.08
	4	0.55 to 0.83	0.67	0.90 to 1.03	—	0.98
	5	0.69 to 0.76	0.71	0.90 to 1.04	—	1.04
	6	0.61 to 0.89	0.73	1.02 to 1.14	—	1.20
Bihar	1	0.83 to 0.94	0.88	—	1.39	1.35
	2	0.90 to 1.15	1.04	—	1.19	1.31
	3	0.92 to 1.09	0.97	—	1.19	1.10
West Bengal	1	1.39 to 1.69	1.50	—	2.02	1.98
	2	1.25 to 1.55	1.42	—	1.57	1.56
Orissa	1	0.72 to 0.86	0.80	—	0.98	1.07
Andhra Pradesh	1	0.71 to 0.86	0.77	—	1.34	1.28
	2	0.94 to 0.99	0.97	—	1.19	1.11
Madras	1	0.76 to 0.95	0.84	0.87 to 1.58	—	1.06
Kerala	1	1.19 to 1.38	1.28	—	1.38	1.39
Bombay	1	0.78 to 0.89	0.83	—	1.19	1.13
	2	0.68 to 0.72	0.70	—	1.08	1.02
	3	0.70 to 0.99	0.85	—	1.32	1.16
	4	0.87 to 1.15	1.00	—	1.45	1.44
	5	1.00 to 1.34	1.12	—	1.86	1.57
	6	1.29 to 1.63	1.42	—	1.90	1.76
Mysore	1	0.74 to 0.82	0.79	—	1.31	1.27
	2	0.87 to 0.96	0.90	—	1.39	1.35
Punjab, Delhi and Himachal Pradesh	1	1.90 to 2.95	2.54	2.49 to 5.00	—	2.49

Notes: (1) This table is based on Table E. 2.3 (p. 142) given in the NSS Report containing the sub-sample estimates by ALE zones. These estimates are given only for wages of male labour in "All agricultural operations."

(2) For the States for which the AWI wage data are available operationwise, the range of these wages and the wage for "Other agricultural labour" are shown for each zone. For the other States, the wages for "Field labour" and "Other agricultural labour" are shown.

The second major finding of the comparative analysis concerns the correlation between the AWI and NSS wages. The range of variation of the two wages and the correlation between them within each set of comparison are presented in Table V. The correlations are all seen to be positive and, in most cases, high in degree.<sup>8</sup> We interpret these correlations as providing acceptable enough evidence of reliability of the AWI data in the sense that these data appear to be capable of serving as good proxies for the NSS wages in cross-sectional investigations across regions. The one reservation that we would like to make arises from the wide range of inter-zonal variation in wages observed in Table V. One cannot conclude from Table V that the AWI data will be equally good proxies for the NSS wages in situations involving analysis of variations in wages *within* homogeneous zones which would be of a much more modest order.

TABLE V—INTER-ZONAL RANGE OF VARIATION AND CORRELATION OF NSS AND AWI WAGES

(wages in annas per day)									
				NSS range		AWI range		Rank correlation	Correlation
				Mini- mum	Maxi- mum	Mini- mum	Maxi- mum		
Wages for male labour									
Ploughing	..	..	12	10.24	39.84	11.27	40.38	0.37	0.83
Sowing	..	..	5	8.80	35.04	11.60	39.90	0.90	0.72
Weeding	..	..	12	7.84	42.56	9.40	40.17	0.51	0.91
Harvesting	..	..	12	9.60	40.16	11.24	80.00	0.78	0.94
Field labour	..	..	17	10.56	26.64	15.64	32.33	0.71	0.78
Other agricultural labour	..	..	29	9.60	40.00	10.39	39.90	0.84	0.91
Wages for femal labour									
Ploughing	..	..	5	8.00	16.96	9.00	16.00	0.60	0.44
Sowing	..	..	4	6.88	14.56	10.24	24.30	1.00	0.95
Weeding	..	..	11	7.20	12.80	8.67	17.33	0.74	0.79
Harvesting	..	..	12	7.36	22.72	10.45	32.00	0.62	0.78
Field labour	..	..	17	6.08	18.88	10.67	25.18	0.83	0.88
Other agricultural labour	..	..	28	6.56	24.16	9.60	24.74	0.68	0.64

8. We report both full correlation and rank correlation, the latter being the more appropriate coefficient to consider if one were only interested in knowing how well the ranking of the ALE zones by the AWI data conforms to the ranking by the NSS data. It needs to be emphasized that we employ correlations and, a little later below, regression in this paper as *purely descriptive measures* of relationships observable in the appropriate scatter-diagrams of the AWI and the NSS wages. Hence, these results are presented without any reference to tests of significance.

It is now necessary to look further into the reasons why the AWI data over-state the level of wages. Hopefully, this is a lead whose pursuit could give us better understanding of the nature of deficiencies in the AWI data. With the indirect approach of evaluation used in this paper, it is only possible to speculate on this point though an attempt has been made to make the speculation as informed and verifiable as possible by relying on a systematic procedure for investigation. The procedure consists, simply, in looking hard at the scatter-diagrams of the AWI and NSS wages relating to each set of comparison. Remembering the positive and high correlations between the two wages, it is easy to see that, if non-systematic errors were the only source of difference between the two wages, the best-fitting lines (BFL) in the scatter-diagrams would either be the 45° line or lines close to it. Systematic errors would show themselves up in the form of deflection of BFL away from the 45° line. One obvious advantage of this procedure is that it makes the nature of over-statement of level by the AWI wages much more clear than is done by Table II. To see this, let us turn to Table VI.

TABLE VI—REGRESSION OF NSS WAGE ON AWI WAGE  
(BASED ON INTER-ZONAL VARIATION)

		Number of comparable zones	'a' (intercept)	'b' (slope)	'a/(1-b)'	Remarks
<b>Wages for male labour</b>						
Ploughing	..	12	-1.58	0.87	-12.15	Below minimum
Sowing	..	5	4.74	0.71	16.34	Between minimum and maximum
Weeding	..	12	-5.94	1.10	59.40	Above maximum
Harvesting	..	12	6.77	0.42	11.67	Between minimum and maximum
Field labour	..	17	1.11	0.70	3.70	Below minimum
Other agricultural labour	..	29	-4.04	0.97	-134.67	Below minimum
<b>Wages for female labour</b>						
Ploughing	..	5	3.23	0.58	7.69	Below minimum
Sowing	..	4	0.91	0.53	1.94	Below minimum
Weeding	..	11	3.81	0.44	6.80	Below minimum
Harvesting	..	12	1.04	0.65	2.97	Below minimum
Field labour	..	17	0.14	0.75	0.56	Below minimum
Other agricultural labour	..	28	1.10	0.66	3.24	Below minimum

Table VI is in the nature of a convenient substitute for the scatter-diagrams with the BFL and the 45° line incorporated in them. Let us suppose that the AWI wages are measured along the horizontal axis and the NSS wages along the vertical axis. Columns 'a' and 'b' in Table VI show, respectively, the vertical intercept and slope (with respect to horizontal axis) of the BFL. Column 'a/(1-b)' shows the value along the horizontal axis above which the BFL and the 45° line intersect and the last column indicates whether this value is within the range of observed AWI wage values, below the range or above the range. The typical BFL that we get in Table VI is one which lies below the 45° line throughout the observed range and has



a slope *less* than the slope of the 45° line (the latter slope equals one in value). The location of the BFL below the 45° line is due merely to the element of over-statement present in the AWI wages. It is really the information about the slope of the BFL, *viz.*, that the slope is typically *less* than one which is a new finding in the sense that it could not have been inferred from Tables II and V alone. It means, in words, that while the AWI wages exceed the NSS wages the difference between the two is narrow in zones with relatively low level of wages and it tends to widen as we move from low-wage zones to high-wage zones.

The scatter-diagram analysis permits one more point to be investigated, *viz.*, the relative importance of systematic errors in AWI wages as compared to non-systematic errors. The assumption that we make for this purpose is that the systematic errors are reflected in the divergence between the BFL and the 45° line while the non-systematic errors are reflected in the scatter of points around the BFL. The results—given in Table VII—show that in most sets of comparison the systematic errors constitute the larger component of the errors in the AWI wages.<sup>9</sup> It is usual to regard systematic errors to be products of a few major and identifiable sources—and, hence, often remediable in practice—and non-systematic errors as arising from sources too numerous and diverse for analysis. Table VII suggests that efforts to identify and remove the systematic errors in the AWI wages would be worthwhile.

TABLE VII—SYSTEMATIC AND NON-SYSTEMATIC ERRORS IN AWI WAGE\*

					Percentage of systematic errors	Percentage of non-systematic errors	Total
Wages for male labour							
Ploughing	..	..	..	..	17.76	15.29	33.05
Sowing	..	..	..	..	8.57	19.18	27.75
Weeding	..	..	..	..	20.21	14.16	34.37
Harvesting	..	..	..	..	26.10	8.55	34.65
Field labour	..	..	..	..	22.44	9.20	31.64
Other agricultural labour	..	..	..	..	20.74	9.24	29.98
Wages for female labour							
Ploughing	..	..	..	..	13.05	19.85	32.90
Sowing	..	..	..	..	37.12	11.46	48.58
Weeding	..	..	..	..	14.91	41.24	56.15
Harvesting	..	..	..	..	24.96	13.56	38.52
Field labour	..	..	..	..	22.22	8.14	30.36
Other agricultural labour	..	..	..	..	22.56	12.34	34.90

\* See footnote 9 for an explanation of the basis of this table.

9. Let  $X$ =AWI wage,  $Y$ =NSS wage and  $Y_e = a + bX$  be the equation of the best-fitting line. Then,  $Y \equiv X + (Y_e - X) + (Y - Y_e)$ . We regard the second term on R.H.S. as indicating the systematic error and the third term the non-systematic error in the AWI wages. For the purpose of Table 7, we define  $Y^* = X + |Y_e - X| + |Y - Y_e|$ , based on absolute rather than squared deviations, and compute the appropriate percentages after summing up both the sides of the equation.

Since this is as far as one can go with the help of data alone, we now offer a few speculations regarding the sources of systematic errors in the AWI data. It is helpful, at the outset, to note the important differences between the NSS and AWI schemes for collection of data. The NSS data were collected, on the basis of an elaborate statistical design to ensure that the samples chosen were representative, from nearly 21,000 agricultural labour households spread over nearly 3,700 villages located in the rural areas of 328 districts. The number of sample villages and agricultural labour households works out to about 12 and 70, respectively, per district and about 100 and 600, respectively, per ALE zone. In contrast, the AWI data were collected from, in all, 478 villages located in 260 districts giving an average of 1.8 villages per district and an average of less than 15 villages per ALE zone.<sup>10</sup> What is even more important than the small number of villages covered in the AWI scheme is the possibility that most of these villages were big and semi-urban in size and structure like taluka places and, hence, not representative of the general run of villages in the district and in the ALE zone.<sup>11</sup> Equally important, the AWI scheme, as was noted above in section I, does not specify the respondents from whom the wage data are to be collected and, very likely, the data are supplied by the bigger farmers and other prominent persons in the village and not by the wage-receivers. These hunches about the villages and respondents covered in the AWI scheme should appear very plausible in the light of the general theme which recurs in different contexts in the Indian scene that it is the bigger villages and the better-off strata of rural society which have better access to Government departments, personnel and programmes. Given the atypicality of villages and respondents, it would seem inevitable that the AWI data should over-state the level of wages; wages are likely to be higher in the bigger and semi-urban villages as compared to wages in the surrounding rural hinterland and the wages—"most commonly current during the month"—as reported by the bigger farmers are even more likely to diverge from the average level due to respondent bias and non-specific nature of the information elicited. One more hunch that we would like to add is that the inter-village variations in wage levels are likely to be wider in zones with high wages than in those with wages close to the subsistence level.<sup>12</sup> If this is granted, it would follow that the difference in wages as between bigger villages and the surrounding hinterland would be more marked in zones with high wages than in those with low wages. We, thus, appear to get a fairly reasonable explanation of the systematic errors in the AWI data in terms of the atypicality of villages and respondents covered in the AWI scheme; it is needless to add that the argument relies crucially on a few

10. This was the position in 1956-57. There seems to have occurred some marginal improvement in the AWI scheme since then as regards the number of villages covered in the scheme. In 1965-66, the latest year for which "Agricultural Wages in India" is available to us, the coverage was 628 villages as against 478 in 1956-57. The scheme appears to have remained unaltered in other respects.

11. We get this impression from the villages selected in districts like Thana and Kolaba in Maharashtra which we know closely.

12. It can be observed in Table V that the operationwise minimum daily wages ranged between 8 annas and 10 annas for males and between 6 annas and 8 annas for females. Hence, in zones with low wages, the wage can be regarded as being close to the subsistence level wage.

hunches which need verification. A recent study on agricultural wages using the AWI data argues that these data reflect only the peak period wages and, hence, over-state the level.<sup>13</sup> We take up this point in the next section which discusses the broader issue of the reliability of the AWI data on seasonal pattern of wages.

### III

#### COMPARISON OF AWI AND SEFM WAGE DATA

A word about the SEFM wage data used in this section. As in the case of the NSS, these data relate to a much larger sample of villages—16 villages per district in the initial series of farm management studies and 10 villages per district in the later series—as compared to the AWI scheme. However, unlike the NSS, the SEFM wage data were not collected from samples of agricultural labour households; the wage data for field labour formed an item of background information collected for the villages selected in the SEFM and the procedures and sources relied on for obtaining the information are mentioned explicitly only in a few of the SEFM reports.<sup>14</sup> Apparently, the source of data on prices and wages was, in most cases, the relevant fortnightly statement from the village records, a source similar to that relied on by the AWI scheme. It, however, needs to be remembered that the field investigations of the SEFM are conducted by trained investigators who either stay continuously in the selected villages or pay repeated visits to them over the period of study. Hence, *prima facie*, the data may be expected to have been carefully scrutinised and checked by the SEFM staff before their inclusion in the report. We may also mention that the comments which the SEFM reports make on the wage data give a strong impression that the authors of the reports consider the data to reflect well, among other things, the seasonal variation in wages.<sup>15</sup> In any case, to the best of our knowledge, no single source, other than the SEFM reports, contains data on seasonal variation of wages in a wide range of environments.

The comparative analysis reported in this section is carried out at the district level and covers 9 districts spread over 6 States—Nasik and Ahmednagar in Maharashtra, West Godavari in Andhra Pradesh, Salem and Coimbatore in Madras, Sambalpur in Orissa, Monghyr in Bihar and Hooghly and

13. See N. Krishnaji, *op. cit.*

14. The SEFM contain monthwise wage rates for field labourers. In most cases, the wage rates are shown separately for males, females and children. Since the seasonal variations in wages can be visualised in terms of *either* month to month variation *or* operation to operation variation but not *both* and since the SEFM present data on the former basis, the analysis in this section proceeds in terms of month to month variation without any reference to operationwise wages.

15. See, in particular, the SEFM reports for West Godavari (p. 38), for Salem and Coimbatore (pp. 5-6), for Sambalpur (p. 33), for Monghyr (Chapter 3), for Hooghly and 24 Parganas (p. 17) and for Nasik and Ahmednagar (p. 33). It may also be mentioned that the Rath and Joshi study (*op. cit.*), which doubts the suitability of the AWI data for seasonal analysis, turns to the SEFM data as more acceptable for this purpose.

24 Parganas in West Bengal. The SEFM reports relating to these States provide monthwise wage data over a full year for 28 district-years (on the basis of separating the data by years and by category of workers, *viz.*, male, female and child). While not all the SEFM reports contain monthwise wage data (*e.g.*, Punjab for the year 1961-62, Uttar Pradesh for the years 1954-55 to 1956-57, Madhya Pradesh for the year 1955-56 and Nasik and Ahmednagar for the year 1954-55), it is likely that a fuller coverage of the SEFM reports than was possible in the present paper would yield some additional sets of comparison. We, however, feel that the coverage of districts and States in the comparative analysis is wide enough to ensure dependable findings. The districts, years and categories of labourers covered in the analysis are shown in Table VIII.

TABLE VIII—LIST OF DISTRICTS, YEARS AND CATEGORY OF LABOURERS COVERED IN THE COMPARISON OF SEFM AND AWI WAGES

District	Year	Category	Average wage (Rs.)		Ratio of AWI to SEFM	Number of months in which AWI wage exceeded SEFM wage
			SEFM	AWI		
Nasik (Maharashtra)	1955-56	Male	0.89	1.22	1.37	11 out of 11
	1955-56	Female	0.53	0.91	1.72	11 out of 11
	1955-56	Child	0.41	0.69	1.68	11 out of 11
	1956-57	Male	0.96	1.20	1.25	12 out of 12
	1956-57	Female	0.66	0.86	1.30	11 out of 12
	1956-57	Child	0.60	0.62	1.03	7 out of 12
Ahmednagar (Maharashtra)	1955-56	Male	0.93	1.03	1.11	12 out of 12
	1955-56	Female	0.48	0.51	1.06	10 out of 12
	1955-56	Child	0.47	0.33	0.70	0 out of 12
	1956-57	Male	1.01	1.10	1.10	10 out of 12
	1956-57	Female	0.52	0.51	0.98	6 out of 12
	1956-57	Child	0.52	0.30	0.58	0 out of 12
West Godavari (Andhra Pradesh)	1957-58 to 1959-60	Male	1.24	1.55	1.25	11 out of 12
	1957-58 to 1959-60	Female	1.00	1.26	1.26	11 out of 12
Salem and Coimbatore (Madras)	1954-55	Male	0.97	1.27	1.31	9 out of 11
	1955-56	Male	0.97	1.33	1.37	12 out of 12
	1956-57	Male	1.05	1.43	1.36	12 out of 12
	1956-57	Female	0.53	0.60	1.13	12 out of 12
	1956-57	Child	0.40	0.40	1.00	4 out of 12
Sambalpur (Orissa)	1957-58 to 1959-60	Male	0.92	1.04	1.13	8 out of 9
	1957-58 to 1959-60	Female	0.74	0.74	1.00	4 out of 9
	1957-58 to 1959-60	Child	0.65	0.59	0.91	1 out of 9
Monghyr (Bihar)	1957-58	Male	1.26	1.50	1.19	10 out of 12
	1957-58	Female	1.08	0.91	0.84	2 out of 12
	1957-58	Child	0.72	0.91	1.26	9 out of 12
Hooghly and 24 Parganas (West Bengal)	1954-55	Male	1.50	1.70	1.13	11 out of 12
	1955-56	Male	1.46	1.65	1.13	12 out of 12
	1956-57	Male	1.58	1.65	1.04	8 out of 11

An incidental finding of comparing the AWI and SEFM wages is that, as in the case of comparisons made in the previous section, the former are consistently higher than the latter (see the last four columns of Table VIII). Since the element of over-statement present in the AWI wages and the probable reasons thereof have already been commented on in the previous section, we shall only add here that the explanation that we provide—*viz.*, atypicality and small number of villages covered in the AWI scheme—looks all the more plausible in the light of Table VIII. Unlike the NSS, the SEFM data on wages (and prices) seem to come for the most part from the village records—a source comparable to the source relied on by the AWI scheme—and, hence, the difference between the SEFM and AWI wages would be due chiefly to the larger and more representative sample of villages covered in the SEFM (10 to 16 villages per district in the case of SEFM as compared to the average of less than two villages per district in the case of AWI scheme).

We now come to the main findings of this section, *viz.*, the extent to which the seasonal variations in the AWI wages conform to those in the SEFM wages. The comparison of the two patterns is done in terms of the following characteristics: (a) the minimum level reached by the wage and the month reporting it, (b) the maximum level reached by the wage and the month reporting it, (c) range of seasonal variation, *viz.*, maximum wage minus minimum wage, (d) relative range of seasonal variation, *viz.*, range as per cent of minimum wage, (e) number of distinct values of wage reported in the year, and (f) correlation between the two wages over the year. The results of comparison are presented in Tables IX to XV with each table covering a single district (or a pair of districts where the SEFM report contains only the combined data).<sup>16</sup>

Two points need to be borne in mind while interpreting these tables. Firstly, as the SEFM data showed, seasonal variations in wages were not equally marked in all the environments. Among the 9 selected districts, the range of variation of the order of 50 paise or above was met with in only 2 districts—Monghyr and West Godavari; in comparison, the range was seen to be much narrower in the remaining districts, particularly in Nasik, Ahmednagar, Salem, Coimbatore and Sambalpur. It seems reasonable to propose that the issue of reliability of the AWI data in relation to seasonal variations in wages is more relevant and important in environments with wide range of variation than in all environments irrespective of the extent of seasonal variations; in other words, any deficiency in the AWI data in this respect will be a serious handicap in using them in only some environments and not in all. Secondly, it is very plausible that the bigger and semi-urban villages covered in the AWI scheme tend to have smaller range of seasonal variation in wages than is the case in the surrounding rural hinterland. It is also possible that the time-pattern of seasonal variation in wages

16. To save space, only one of these tables—Table IX—is included in this paper as an illustration of the type of analysis done in this section. The full set of tables can be had from the author on request.

TABLE IX—SEASONAL PATTERN OF WAGES IN NASIK (MAHARASHTRA)\*

Characteristics		1955-56						1956-57					
		Male		Female		Child		Male		Female		Child	
		SEFM		SEFM		SEFM		SEFM		SEFM		SEFM	
		AWI		AWI		AWI		AWI		AWI		AWI	
Minimum wage (Rs.)	..	0.84	1.00	0.49	0.75	0.38	0.62	0.85	1.12	0.54	0.79	0.40	0.54
Month	.. ..	April (Jan. to March)	Jan.	Jan. and April (March)	Jan.	Jan., March, April	Jan., March, April	May (June)	June	May and June	June	May	March, April
Maximum wage (Rs.)	..	0.94	1.25	0.60	0.94	0.46	0.72	1.12	1.25	0.80	0.92	0.72	0.67
Month	.. ..	July (June and Aug.)	All months other than Jan. and April	Oct.	All months other than Jan. and April	Oct.	All other months	March	Dec., Jan., Feb.	March	Dec.	Oct.	Dec.
Range (Rs.)	.. ..	0.10	0.25	0.11	0.19	0.08	0.10	0.27	0.13	0.26	0.13	0.32	0.13
Relative range (range as per cent of minimum)		12	25	22	25	21	16	32	12	48	16	80	24
Number of distinct values	..	8 out of 11	3 out of 11	8 out of 11	3 out of 11	6 out of 11	2 out of 11	10 out of 12	4 out of 12	10 out of 12	5 out of 12	11 out of 12	5 out of 12
Correlation	.. ..	0.50		0.48		0.65		0.13		-0.46		-0.28	

\* Please see footnote 16.

in these villages is influenced to a much greater extent—as compared to the position in the general run of villages—by non-agricultural demand for labour. There is, hence, a presumption that, as compared to the SEFM data, the AWI data would tend to under-estimate the extent of seasonal variation in wages and show dissimilar time-patterns of variation. This presumption is both an indication of the likely errors in the AWI data as well as an opportunity to test further, with the help of the SEFM data, the explanation for systematic errors in the AWI data suggested in the previous section.

We now describe the results of comparing the AWI and SEFM wages in the light of the two considerations set out above. We begin with the worst cases, *viz.*, where the AWI data totally missed the seasonal variation by reporting same, or nearly same, wage in all twelve months; much of the prevailing distrust of the AWI data is, obviously, due to such cases. Three out of the 9 selected districts and, more precisely, 6 out of the 28 district-years used in the analysis fell in this category of cases. The cases were male, female and child wages in Monghyr relating to the year 1957-58 and in Salem and Coimbatore relating to the year 1956-57. Of these, the cases in Monghyr were really the worse since this district was characterized by wide seasonal variation in the SEFM wages. In comparison, the seasonal variations were much more modest in Salem and Coimbatore in the case of male wages and were almost non-existent in the case of female and child wages. It may also be mentioned that, assuming that the maximum SEFM wage was the peak period wage, the constant AWI wages reported in Monghyr, Salem and Coimbatore did not appear to be the peak period wages in the sense of being consistently close to the maximum SEFM wage.

Leaving aside the cases noted above, the AWI data did show seasonal variations in wages in the remaining cases which constituted the substantial majority of the cases covered in our analysis (*viz.*, 6 out of 9 districts and 22 out of 28 district-years). Following were the characteristic differences in the seasonal pattern of SEFM and AWI wages as shown by these cases.

- (a) The AWI data, barring a single case, reported smaller number of distinct values of wage over the year (3 to 5 distinct values in most cases) as compared to the SEFM data (6 to 8 distinct values over the year in most cases).
- (b) In nearly two-thirds of cases, the range as well as the relative range of seasonal variation of wages was narrower in the case of the AWI data as compared to the ranges displayed by the SEFM data.
- (c) No consistent finding emerged about the correlation of two wages over the year (the correlation was positive in 14 cases and negative in 8 cases and, among the positive cases, correlation coefficients 0.50 or above in magnitude were reported in only 5 cases). This was also true of the agreement between the two wages regarding the months of peak wages and trough wages, the cases of agreement being about as numerous as the cases of disagreement.



It is our feeling that the difference (a) noted above is indicative of the tendency on the part of the AWI data to miss the *finer* variations in wages over the year (say, the *intra-season* variation such as variation *within* the peak period and trough period of wages); in other words, the AWI data are possibly relatively crude in the sense that they succeed in capturing only the *inter-seasonal* component of variation in wages over the year. Differences (b) and (c) noted above imply that the AWI wages move within a narrower range of seasonal variation and that their time-pattern is not consistently the same as the time-pattern of SEFM wages. Both these implications are in accordance with what one would expect, as noted earlier above, under the hypothesis that the AWI scheme makes an atypical selection of villages for collecting wage data by confining the choice to the bigger and semi-urban villages.

Let us now summarise the findings of this and the previous section and note the implications. Two major defects of the AWI data seem to stand out clearly in the comparative analysis, *viz.*, (i) these data reflect the level and movement of agricultural wages as they prevail in the bigger and semi-urban villages rather than in the general run of villages in rural areas, and (ii) they are possibly too crude to capture the finer components of temporal and spatial variation in agricultural wages. In our view, these defects do not render the AWI data so unreliable as to be of no worth whatsoever in research uses. It can be conceded that researches focused on the finer components of wage-variation or those seeking to provide precise measurements of the levels and changes in wages would get little help from the AWI data. It can also be granted that in researches involving analysis of seasonal variation of wages the use of the AWI data needs to be confined to those districts/regions in which the AWI villages are judged to be not markedly atypical. This would still leave a number of research issues, such as those involving only qualitative or directional hypotheses about agricultural wages, with scope for fruitful use of the AWI data. It was seen in section II that the AWI wages for males and females and for different operations are good proxies for the NSS wages as far as the inter-zonal variation in wages is concerned. This means that most of these qualitative hypotheses concerning the level and structure of agricultural wages which are capable of being tested by the NSS data could fruitfully be investigated with the help of the AWI data which, unlike the NSS data, are available on a continuous basis. This would also appear to be true of qualitative hypotheses relating to the movements of wage over periods covering marked trends or cycles in wages which, in the light of our analysis, are unlikely to be missed by the AWI data (see the Appendix for some evidence on this point).<sup>17</sup>

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17. Though the limited nature of the evaluation of the AWI data attempted in this paper should be evident, two major limitations may be mentioned explicitly. Firstly, it is possible that the reliability of the AWI data differs as among different regions and years; this issue would obviously need much more detailed investigations than could be covered within the space of a single paper. Secondly, the question of usability of the AWI data in time-series analyses going beyond intra-year movement of wages could not be directly examined in this paper. It seems very likely that suitably designed trial analyses of the AWI data may be the only feasible approach to investigate this issue.



Finally, we discuss briefly the modifications needed in the AWI scheme to improve the reliability and precision of data provided by the scheme. Obviously, these modifications have to be feasible with the basic character of the scheme as an arrangement for collection of data through administrative departments on the basis of procedures which, perforce, have to be rough and ready. It is our feeling that substantial improvements in the AWI data are possible even within the constraints implied by the basic character of the AWI scheme. First and foremost, the selection of villages for the scheme needs to be done to ensure their representativeness. Marked improvement in this respect may be expected if the Directorate of Economics and Statistics itself makes the selection once in a year or at longer intervals or, at least, lays down a simple procedure for random selection of villages for this purpose which should not be difficult to devise. It would, of course, be desirable to increase the number of selected villages in each district but, even if this is not feasible for some reason or other, it should at least be possible to modify the *manner* of selection to get a sample of villages less atypical than what seems to be the case at the moment. Secondly, the scheme should be more explicit and forthcoming on the way in which the wage data are to be collected within the selected villages. As a first step, the Directorate may find out how the scheme actually operates in this respect in different States. This may reveal both specific deficiencies and scope for improvement. A researcher using the AWI data is likely to suggest that the wage data be collected from a sample of labourers, however small, in terms of their *actual* days of employment and earnings in a month. If this is not feasible, the alternative procedures need to be carefully thought out and adopted at the Directorate level without leaving the decisions in this respect to those at the primary level. Thirdly, in a scheme like the AWI scheme, careful scrutiny and compilation of data are as important as collection; cases like Monghyr, though mercifully few within the cases studied by us, do no credit to the scheme since errors which should hit one in the eye seem to get into the AWI publication without, apparently, any one in the scheme being aware of them. Besides routine scrutiny, the Directorate should arrange for regular internal evaluation of data collected under the scheme to ensure that some of the common and recurring sources of error are detected early enough for remedial action. It is hoped that these modifications will go a long way in making the AWI data more acceptable to the researchers and, in the process, help in dispelling the impression that administratively collected data which are cheap in terms of costs have necessarily to be poor in quality.

#### CONCLUSIONS

This paper makes an attempt to evaluate the reliability of agricultural wage data contained in "Agricultural Wages in India"—an annual publication issued by the Directorate of Economics and Statistics, Ministry of Food and Agriculture, Government of India—by comparing these data with those obtained from two other important sources of data on agricultural wages,

*viz.*, the National Sample Survey and Studies in Economics of Farm Management. The comparisons show that the AWI data contain errors in relation to both the level and seasonal variation of wages but an analysis of these errors suggests that they are due, primarily, to the small and atypical sample of villages covered in the AWI scheme; while cases of flagrantly bad and negligent reporting of wages do show up in the analysis, they seem to be few enough to be regarded as occasional lapses rather than as a persistent vice running through the entire body of data collected under the scheme. More encouragingly, the analysis indicates that, despite some systematic errors, the AWI data may still be found to be of use in research investigations, particularly in those involving *qualitative* hypotheses about the behaviour of agricultural wages, cross-sectionally or over time. It would also appear that modifications are feasible in the scheme, without altering its basic character, to improve the quality of data collected under the scheme. The broader significance of this finding is that the relatively inexpensive procedure of collecting data through administrative departments—a procedure which will be with us for a long time to come until specialised agencies for data collection grow to the point of replacing it—appears to have good potential for providing usable data.<sup>18</sup>

## APPENDIX

### SOME RECENT STUDIES ON AGRICULTURAL WAGES

This appendix presents a brief summary of the findings contained in some recent studies on agricultural wages. The intention is merely to bring these studies to the notice of researchers interested in the issue of reliability of the AWI data rather than provide anything like a regular survey of the literature pertaining to agricultural wages. Some of these studies are based on the AWI data while the others have drawn their statistical material from alternative

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18. Based on the ideas that occurred to us during the course of preparing this paper, we suggest below a categorisation of empirical data according to their usefulness in research applications. Data of highest order of usefulness are *precise data*, *i.e.*, data good enough for all research purposes including those requiring precise measurements of levels of variables and of relationships among them. Since in most research contexts it will be difficult, if not impossible, to get precise data, the next best thing for a researcher would be to look for *reliable data*, *i.e.*, data as good as precise data excepting for random errors judged to be small in magnitude. Among the currently available data, those provided by systematic surveys—such as the NSS, Rural Credit Surveys, Farm Management Surveys, etc.—may be taken, by and large, as falling in the category of reliable data. This would still leave out large bodies of data which, considering the arrangements and procedures yielding them, cannot automatically be labelled as “reliable.” We suggest that this material consists, at least in part, of *usable data* by which we mean data which are subject to systematic errors and/or larger random errors than the case is with *reliable data*. These data are usable in the sense that, with due scrutiny and evaluation, it would be found possible to use them in practice after adjusting or allowing for the component of systematic errors in them. The remaining would be *non-usable data* which cannot be thus salvaged for use even after considerable research efforts for their scrutiny and evaluation. The tasks facing those in charge of large-scale collection of data are (i) to ensure that as much of data being collected as possible are reliable, and (ii) to minimize the expenditure of resources currently going into the collection of non-usable data. The researcher’s task is to help this process by separating usable data from non-usable data and by suggesting measures for upgrading both the categories of data. This is, essentially, a *research* task since, as a little reflection would show, characteristics of data can be discovered only in the course of working with them.

sources of data on agricultural wages. The former should be of help to the researchers in finding out how plausibly the AWI data perform in actual research uses and in taking note of specific reservations with which the AWI data have been used in these studies; the latter studies should be of interest on two counts: (i) reasons owing to which the authors of these studies turn to alternative sources, and (ii) findings on agricultural wages, based on alternative sources, which would be very relevant in planning trial analyses of the AWI data to carry further the investigation of their reliability. The findings are presented under the following heads: (1) Trends in Money Wages and Real Wages in Agriculture, (2) Seasonal Variations in Agricultural Wages, and (3) Market-Determination of Agricultural Wages. The attitudes of researchers towards AWI data—reservations with which they use these data and the reasons for which they turn to alternative sources—are summarised under the last head, (4) Researchers' Comments on AWI Data.

### 1. *Trends in Money Wages and Real Wages in Agriculture*

(a) *Rath and Joshi*<sup>19</sup> present two analyses of wage movements—one relating to the Bombay Presidency and covering the period 1924 to 1940 and the other relating to a number of States and covering the period 1954 to 1957; interestingly, the first of these is based on data collected by the Provincial Government (which are similar to the AWI data as regards mode and agency of collection) and the second is based on the SEFM data. As regards the period 1924-1940 (covering the years of Great Depression), the authors find that "Not only wages not fall as sharply as prices (cereal prices), but also the adjustment of the wage level to a very low level of prices was rather slow. The price level began rising above the wage level since 1938 but the series (*i.e.*, the data used by the authors) ends soon after and, therefore, it is not possible to observe how wages behaved when prices of cereals began moving up." (At this point the authors make a reference to a study by *Chaturvedi*<sup>20</sup> relating to the United Provinces and covering the period 1911 to 1944 and, particularly, to its finding that "the wage rise from 1939 to 1944 was less than the rise in prices." *Chaturvedi's* findings for the years prior to 1939 are similar to those of *Rath and Joshi*.) As regards the period 1954-57, the analysis covered districts in five States—Punjab, U.P., West Bengal, Bombay and Madras—and the finding was "except in the case of U.P., the level of wages did not remain unchanged over the three years in these states, but the extent of variation over the three years was not very great, particularly when compared with the changes in the prices of cereals produced and consumed in the region. In Bombay, Madras and West Bengal increase in cereal prices was in each case much more than the increase in wage rates. . . . Punjab showed full reflection of price change in wages." The authors conclude:

19. "Relative Movements of Agricultural Wage-Rates and Cereal Prices: Some Indian Evidence," *Artha Vijnana*, June, 1966, *op. cit.*

20. S. C. Chaturvedi: *Rural Wages in the United Provinces*, Government of United Provinces, Allahabad, 1947.

"Wages appear to take time to adjust, and that too, only if the changed price-level tends to persist over a long period. . . . Both the pre-war and post-war data presented in this paper tend to show that wages are sticky in the short run and lag behind prices in the long run."

(b) Two other studies with similar findings regarding trend in wages are the following : *Sridhar Misra*<sup>21</sup> reports, on the basis of a *field investigation* spread over five regions in U.P., "In all areas wages lagged behind cost of living, marginally in hill tract and substantially in Eastern plain and Bundelkhand." *B. S. Mavin Kurve*<sup>22</sup> observes: "The recent war has demonstrated that agricultural wages lag behind prices much more than industrial wages do."

(c) Following are the studies covering more recent years both of which are based on AWI data. *N. Krishnaji*<sup>23</sup> finds that over the period 1950 to 1964 real wages seem to have increased in Kerala and Orissa and decreased in Assam, West Bengal and Bombay region with no trend in other States. He also finds that between 1960-61 and 1964-65 wages increased at a faster rate in those regions where they were relatively low and decreased where they were relatively high. The author takes this to be an indication of the process of inter-regional convergence in agricultural wages. *Robert W. Herdt and Edward A. Baker*<sup>24</sup> present an appendix showing real wages, money wages and deflator in nine regions in India over the period 1954-55 to 1968-69. They find that between 1954-55 and 1957-58 both real wages and money wages appear to have fallen while in the period after 1957-58 money wages and deflator have both been rising with no clear trend in real wages. Four out of the nine regions studied by them showed significant trend in real wages with one case of a negative trend.

## 2. Seasonal Variations in Agricultural Wages

(a) The *Rath and Joshi's* paper, noted above, offers some passing comments and findings on seasonal variation in wages. The authors note that these variations are not equally marked in all regions and hypothesize that "variations in wage rates over a year are less in those areas where the cropping pattern shows a fair spread over the *kharif* and *rabi* seasons than in those where agriculture is confined to a single season and one or two crops only."

(b) The *Herdt and Baker's* paper contains a more comprehensive analysis of seasonal variations in wages. The authors argue that seasonal variations are influenced by two factors: (i) nature of operations specific to each

21. "Agricultural Wages in Relation to Rural Cost of Living," *Indian Journal of Economics*, Vol. 29, Part 1, July, 1948, pp. 75-80.

22. "Agricultural Wages and Systems of Payment in the Bombay Karnatak," *Indian Journal of Agricultural Economics*, Vol. III, No. 1, April, 1948, pp. 60-68.

23. "Wages of Agricultural Labour," *Economic and Political Weekly*, September 25, 1971, *op. cit.*

24. "Agricultural Wages, Production and the High-Yielding Varieties," *Economic and Political Weekly*, Vol VII, No. 13, Review of Agriculture, March 25, 1972, pp. A-23—A-30.

season, and (ii) extent of diversification of farming. They find that seasonal variations tend to be marked only in a few regions; they remark: "The absence of strong seasonal patterns is striking to these observers." However, they seem to regard this finding as quite plausible within the model of wage-determination used by them. Interestingly, the paper by *Herdt and Baker* seems to be the only one which has made use of the *AWI data* to study seasonal variations in wages.

(c) *S. V. Sethuraman*<sup>25</sup> looks at seasonal variations in terms of differences among the operationwise wages. While analysis of seasonal variations is not the main purpose of his paper, he has brought together in one place the relevant data from the Agricultural Labour Enquiries (1951-52 and 1956-57) and the Rural Labour Enquiry (1964-65). These data should be very useful for carrying further the type of comparative analysis that we have attempted in our paper.

### 3. Market-Determination of Agricultural Wages

The *Herdt and Baker's* paper views all the different types of variations in wages—seasonal, year-to-year and epochal such as those caused by the emergence of the HYV's—as occurring in a competitive market. A consistent finding emerging from their analysis of different types of variations is that the labour market in agriculture is characterized by a perfectly elastic supply of labour at subsistence wage, excepting a few regions with HYV's where the supply curve appears to be upward sloping, with the result that seasonal or year to year shifts in demand for labour get reflected more in changes in employment than in wages; in their view, only substantial shifts in demand such as those brought about by the HYV's are capable of raising wages. *Rath and Joshi* also accept the labour market in agriculture as competitive; they observe: "The seasonality in wage rates would be, by and large, the result of relative demand and supply of casual labour at different times of the year." *C. H. Shah*<sup>26</sup> analyses the broader problem of integration of rural and urban labour markets. He draws the agricultural wage data from the *Second Agricultural Labour Enquiry*. The study indicates that "On the whole, it would seem that the industrial wages are more closely related to employment conditions in industries; the other two factors (agricultural wages and agricultural employment conditions) play a less dominant role." However, it did appear that *wage income* serves to an extent as "the supply price of labour to be recruited for industries."

### 4. Researchers' Comments on AWI Data

Among those researchers who have actually used the AWI data in their papers, *Herdt and Baker*, apparently, accept these data as generally reliable

25. "Seasonal Variations in Unemployment and Wage Rate—Implications for Rural Works Programme," *Economic and Political Weekly*, Vol. VII, No. 24, June 10, 1972, pp. 1149-1155.

26. "Relationship between Industrial and Agricultural Wages: An Empirical Study," Papers and Proceedings of the Seminar held by the Centre of Advanced Study in Economics in March, 1969, University of Bombay, 1970, pp. 295-306.

enough for both seasonal and trend analyses. They seem to regard the low range of seasonal variations in wages observed by them as a real phenomenon rather than as a statistical illusion arising from faulty data; they are even less apologetic about the data in discussing their findings on trends. *Krishnaji*, on the other hand, doubts the utility of the AWI data for seasonal analysis; unlike the researchers relying on casual observation, he shows with the help of statistical analysis that the seasonal component in variations in the AWI wages is negligible as compared to the component of inter-village variations. However, his interpretation of this low seasonal component as an indication of "dubious value" of the AWI data rests squarely on his presumption that large seasonal variations in wages are "facts of real life." Also, he fails to bring out the implications of his results for using the AWI data in cross-sectional studies. As regards trend analysis, *Krishnaji* seems to go along with *Herd* and *Baker* in accepting his findings based on the AWI data as being plausible.

Let us now turn to what the researchers, who go to alternative sources of wage data, have to say about the AWI data. *Rath and Joshi* use the SEFM data after finding in a preliminary review that "these data (AWI data) for a number of centres for the period 1950-62 make one feel sceptical about the reliability of the data in many instances, mainly because of the unchanging wage rates not only over months but over a number of years at a stretch for many centres." They also, in further support of this point, refer to an unpublished study of *K. Mukerji*<sup>27</sup> on regional and functional wage-pattern in Western Maharashtra which "finds it very difficult to discuss any pattern in the set of data made available by the Directorate." It should, however, be mentioned that *Rath and Joshi* stop much short of dismissing the AWI data as entirely worthless; they observe: "Not much systematic effort to use these data appears to have been made so far" (excepting *Mukerji's* study) and they sound almost apologetic while justifying their use of the SEFM data in preference to the AWI data in the following words: "Pending a fuller assessment of these data (AWI data) it might be useful to examine the wage and price data . . . available in the Farm Management Survey Reports" (SEFM data). It also needs to be noted that they use uncomplainingly the data for Bombay Presidency for the period 1924-1940 which would appear to be of same order of reliability as the AWI data. In comparison with *Rath and Joshi*, other researchers appear to dispose of the issue of reliability of the AWI data rather casually. *Shah* does not discuss explicitly why he confines his study to the data from the Agricultural Labour Enquiry. *Sethuraman* remarks that the ALE data chosen by him "appear to be more appropriate than those made available through periodic collection" (AWI data). He describes the ALE data as "derived through investigation from a fairly large sample of agricultural labour households on the basis of the *actual* wage received by them for various operations (and, hence, reflecting) *finer* variations in wage rate" and the AWI data as "collected from selected *market* centres (and, hence,) show little variation

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27. "Agricultural Wage Rates in Western Maharashtra."

in the seasonal pattern of wages.” (emphasis ours.) It needs to be noted that *Sethuraman*’s observations about the AWI data, though not based on a systematic study, are similar to the main findings of our analysis.

The following seem to be the main points emerging from the brief survey reported in this appendix:

- (a) Researchers take the AWI data to be unreliable on the basis mainly of casual and impressionistic scrutiny of seasonal variations in these data. The observed low seasonal variations tend to be *ipso facto* attributed to perverse reporting (*Sethuraman* excepted).
- (b) Wherever the AWI data have been used in trend analysis, the researchers appear to get findings plausible enough to be reported and interpreted.
- (c) The potential of the AWI data for use in cross-sectional studies seems to have been almost totally neglected so far.