GAIHA

RURAL PUBLIC WORKS AND THE POOR:

THE CASE OF THE EMPLOYMENT GUARANTEE SCHEME IN INDIA

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I. INTRODUCTION

The Employment Guarantee Scheme (EGS) in the Indian state of Maharashtra is an innovative anti-poverty intervention. Its success has prompted similar interventions elsewhere. A variant, the Employment Assurance Scheme (EAS), for example, has just been launched on a large scale in some of the most backward regions.[1] The objective of the present study is to provide a detailed review of the EGS, focusing on its impact on the rural poor.

In principle, this scheme (or, more generally, rural public works) confer *transfer* and *stabilization* benefits. Transfer benefits can be *direct*—the gross benefit to a participant less any cost he/she incurs in participating—or *indirect*—including the effect on agricultural wages and higher incomes through the creation of productive assets (e.g., roads) in rural areas.[2] To the extent that an additional source of income

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by the Revenue and Technical Departments is coordinated by committees at the state, district and block levels.

The scheme is financed by a new set of taxes and cesses, and a matching contribution from general revenues of the state government. The burden of new taxes and cesses is borne mostly by urban dwellers—especially those living in Bombay. This is justified on the ground that the EGS restricts migration to urban areas and thus prevents further congestion.

The EGS guarantees employment on demand, preferably within a radius of 8 kms. (originally 5 kms.) from the residence of a participant.[5] The work is overwhelmingly unskilled—head-load carrying, rock-breaking, digging, and so forth—and no choice is offered. As shown in Figure 1, the wage rate is low, determined on the basis of the quantity and quality of work. (In 1988, however, EGS wages were raised substantially following the revision of minimum wages for agriculture). The projects are selected on the basis of their labor-intensity (i.e., the ratio of labor costs to other costs must be 60:40) and productiveness (i.e., whether directly or indirectly they contribute to production). Most of EGS activity is concentrated in agricultural slack periods, to avoid competition with agricultural demand for labor.

C. Size

In sheer absolute size, the employment created under the EGS is substantial. During the 1980s, for example, this scheme provided 142 million person days of employment in a year. However, following the hike in EGS wages in 1988, there was a sharp drop in employment—from over 133 million person days in 1987–88 to over 81 million person days in 1988–89. Soon after there was a slow but steady rise, as shown in Figure 2.

D. Targeting

Earlier studies point to accurate targeting of the EGS. Dandekar and Sathe (1980), for example, report that 90 percent of the workers in their survey of 1500 EGS participants in 1978–1979 lived below the poverty threshold, as against a head-count poverty rate of 49 percent for rural Maharashtra. A similar conclusion follows from a much smaller but more recent survey by Acharya and Panwalkar (1988) of 100 participating households. The mean income of participating households was about 20 percent below the poverty threshold in 1985–1986. Yet another analysis (Bhende et al., 1990), based on the ICRISAT data over the period 1979–1983, further confirms that the EGS was well targeted: days of participation decreased rapidly with increases in wealth and participation was higher in the more backward of the two villages.

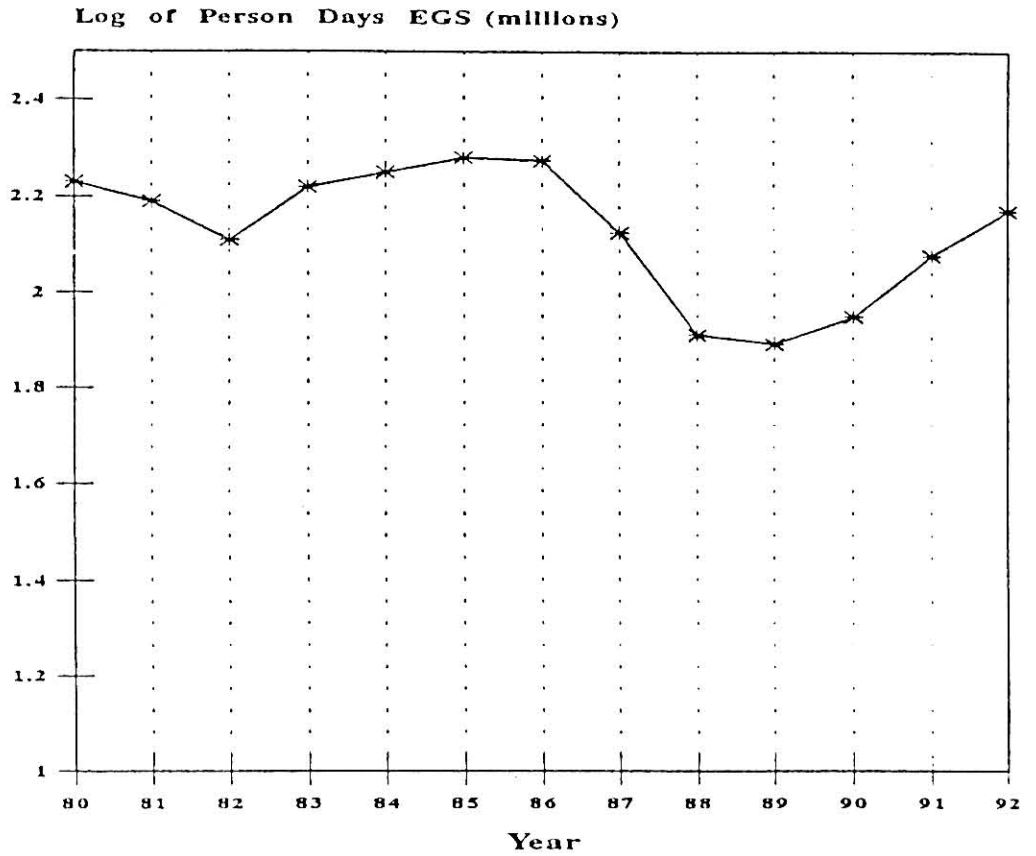


Figure 2. EGS employment during 1980–1992.

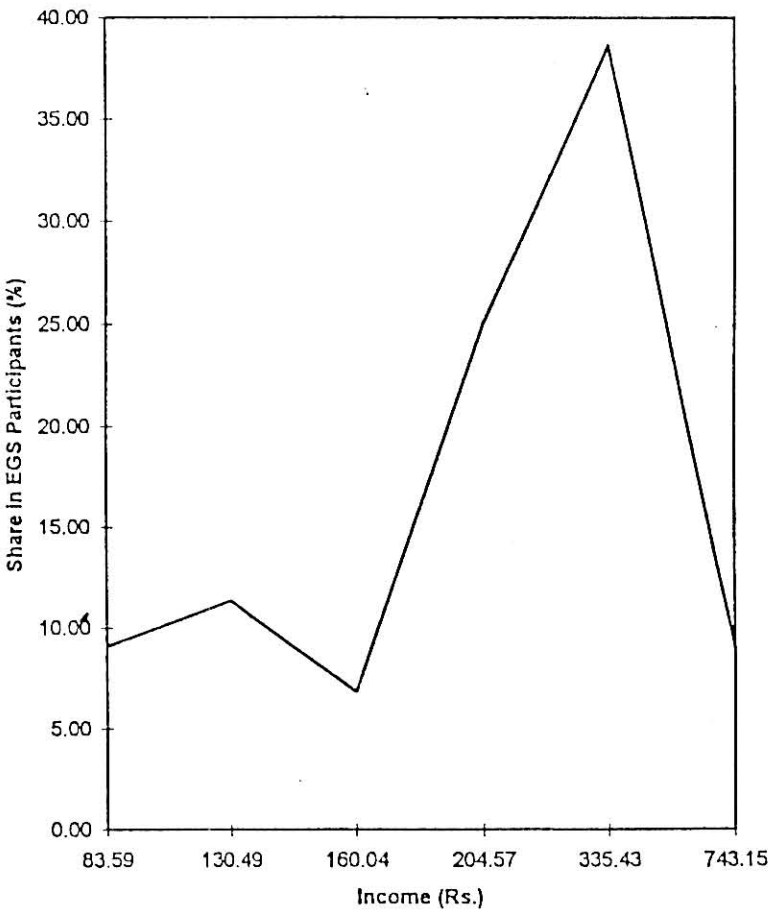
III. DATA

Much of the analysis is based on the ICRISAT VLS (International Crops Research Institute for the Semi-Arid Tropics Village Level Studies) data sets for two villages in Maharashtra (viz., Shirapur and Kanzara).[6] The VLS data are based on panel surveys that were carried out at regular intervals from 1975 to 1984, covering production, expenditure, time allocation, prices, wages, and socio-economic characteristics of 240 households for the villages (in Maharashtra and Andhra Pradesh), representing three agro-climatic zones in the semi-arid region in South India. Given the agro-climatic conditions (viz., semi-arid nature) and purposive selection of the villages, the VLS data are not representative of *all* of rural South India (or even of the semi-arid region in South India, for that matter). Nevertheless, what makes the ICRISAT VLS data unique are their longitudinal nature and their richness in terms of variables covered.

The VLS selected a sample of 40 households from each village. To ensure equal representation of different farm size groups, cultivating households were first divided into three strata, with each stratum having an equal number of households. Ten households were selected at random from each stratum. A random sample of

EGS participation in 1989 (relative to that in 1979). The reduction in overall EGS participation was also accompanied by significant changes in the composition of participants cross-classified by (per capita) income. The compositional changes are shown in Table 1 and illustrated in Figures 3 (a) and 3 (b). Using a poverty cut-off point of Rs. 180 per capita per annum (at 1960–1961 prices), a little over 48 percent of the EGS participants in 1979 were poor. Thus the majority of the participants were non-poor. In fact, a U-shaped relationship held between share of EGS participants and income, with a large share earning incomes well above the poverty threshold. A similar relationship held in 1989 except that the share of the poor among EGS participants was a little over 27 percent.[10] Thus the proportion of the non-poor rose more than moderately.

An issue is whether the U-shaped relationship holds when household income is net of EGS earnings. Given the size of income intervals and the small (but by no means non-negligible) share of EGS earnings in household income, it is not surprising that a similar relationship is reproduced. In other words, although the average income of participants is lower, the U-shaped relationship holds. In particular, the dominance of the relatively affluent persists.



Figures 3a and 3b. (Continued)

Table 2. Participation in EGS by Landowned Class in 1979 and 1989

Landowned Class Participants[1]	Share in EGS (%)[2]		Average Land Owned (in hectares)	
	1979	1989	1979	1989
Landless	24.07	16.13	—	—
0.1–2	18.52	22.58	1.12	0.99
2.1–5	31.48	45.16	3.71	2.65
5.1–10	22.22	16.13	6.56	6.21
≥10.1	3.70	—	11.34	—

Notes: 1. Landowned figures relate to households to which EGS participants belonged.
2. Figures add up to 100.

A cross-classification of EGS participants by landholding class further supplements the analysis of targeting of the EGS. Using the ICRISAT classification, about 46 percent of the EGS participants were either landless or smallholders in 1979.[13] Thus the majority of the EGS participants belonged to households which enjoyed greater access to land. As the bulk of the landless and smallholders were also poor (among the landless over 72 percent were poor in 1979), it follows that a substantial number of EGS participants were neither poor nor lacking in access to land. The compositional changes over the period 1979–1989 further corroborate the mistargeting of the EGS. While the share of the landless fell from over 32 percent to over 19 percent, that of smallholders rose from about 14 percent to about 26 percent over this period.[14] Between the medium and largeholders, on the other hand, while the share of the former in the participants rose (from about 19 percent to 29 percent) that of the latter fell (from 35 percent to about 26 percent). Thus among EGS participants the concentration of those with greater access to land rose more than moderately over the period in question.

EGS participation by landholding class did not differ much from the corresponding labor force participation. The combined share of the landless and smallholders among the EGS participants (about 46 percent) was slightly higher than their labor force participation (over 43 percent) in 1979. Although the share of these two categories among EGS participants remained virtually unchanged (a little over 45 percent in 1989), their labor force participation fell (to 40 percent). There was thus a slight increase in their EGS participation relative to their labor force participation. However, since the (near) constancy of their share in the EGS was due to (an almost) doubling of the share of smallholders, those lacking in access to land participated much less than the smallholders over the period in question. Thus, even within this group, EGS participation shifted in favor of those with access to land and less prone to poverty.

A somewhat surprising finding is the marked disparity between male and female participation in the EGS. Among the participants, well over two-thirds (68.52 percent) were male in 1979. Over the period 1979–1989, their share rose slightly (to 70.45 percent). This gender disparity—specifically, the considerably lower female participation in the EGS—was in striking contrast to nearly equal male-female labor force participation (in 1979, for example, the male and female shares in the labor force were 50.82 percent and 49.18 percent, respectively).[15] The lower participation of women in the EGS is surprising considering that creches are provided and there is parity in wage rates. As pointed out later, the lower female participation is attributable to the design and implementation of the EGS.[16]

A disaggregation of gender-specific participation by income in 1979 and 1989 is given in Table 3.

Overall female participation in the EGS was less than half of male participation (relative to their numbers in the labor force) in 1979. About half of the female participants (47.06 percent) were poor as against two-thirds (66.01 percent) of the male participants. There was a sharp reduction in both female and male participation, the rate of reduction being slightly more rapid among the female participants. Besides, the proportion of the poor also fell sharply among both the male and female participants, with a more rapid reduction among the former (from 66.01 percent to 29.04 percent as compared with a reduction from 47.06 percent to 23.07 percent in the proportion of poor female participants), over the period in question.

Table 3. Gender Specific Participation in EGS by Income in 1979 and 1989

Per Capita Income Class (in Rs.)*	*Female Participation in EGS (%)*		*Male Participation in EGS (%)*	
	1979	*1989*	*1979*	*1989*
0–100	22.53	7.69	17.24	9.68
101–150	17.65	15.38	34.48	9.68
151–180	5.88	—	14.29	9.68
181–250	35.29	38.46	25.71	19.35
251–500	17.65	30.77	35.71	41.94
≥ 501	—	7.69	—	9.68
Overall EGS Participation Rate (as a proportion of labor force)	11.33	5.44	23.87	13.66

Note: *Per capita incomes are at constant prices.

A measure of (net) direct transfer benefits is obtained by subtracting income foregone from EGS earnings. On the basis of some estimates of income foregone, Datt and Ravallion (1994) report that direct transfer benefits are a large fraction of EGS earnings.[23] As estimates of income foregone are not computed separately for the poor and non-poor, and for the two years in question, a precise statement cannot be made about changes in direct transfer benefits as a result of the worsening of the targeting of the EGS. On the basis of changes in EGS earnings *alone*, however, two observations can be made. (i) While EGS earnings (per participant) rose substantially for both the poor and non-poor—from Rs. 103 to Rs. 213, and from Rs. 72 to RS. 237, respectively—the (absolute) increase was larger for the non-poor. (Note that EGS earnings of the poor are somewhat inflated as a few earned substantial amounts). (ii) Also, the share of the non-poor in total EGS earnings rose sharply—from 43 percent to 75 percent—while that of the poor fell. Thus, the non-poor participants benefited more.

V. RATIONING AND/OR WITHDRAWAL

A. Extent of Rationing

Ravallion and associates (1993) attribute the bulk of the reduction in EGS attendance in 1988–1989 (about 86 percent) to rationing. Since EGS wages were hiked without a matching increase in the outlay, they argue that the authorities had no option but to resort to employment rationing. Although an allowance is made for the effect of adequate and timely rainfall following the wage hike, the authors claim that most of the reduction in EGS attendance was due to rationing. This contention is reviewed below, using an alternative specification of the determinants of EGS attendance. The data covering the period 1975–1992 were obtained from the Planning Department, Government of Maharashtra, and Ministry of Agriculture, Government of India.

A logarithmic transformation of EGS attendance (person days), log (P_t), is posited to depend on EGS expenditure, B_t, EGS (daily) wages, WE_t, ratio of EGS wages to (daily) agricultural wages, WE_t/WA_t, and a dummy, D_t, that takes the value 1 for 1988–1989 and 1989–1990, and 0 otherwise, as shown in equation (1).

$$\log(P_t) = \alpha + \beta_1 B_t + \beta_2 WE_t + \beta_3 \frac{WE_t}{WA_t} + \beta_4 D_t + \varepsilon_t \qquad (1)$$

where t represents time and ε is the error term. B_t, WE_t and WA_t are at constant prices. Given the EGS wage rate, WE_t, a higher expenditure, B_t, would imply a higher attendance (or employment).[24] On the other hand, given the EGS expenditure, a higher EGS wage rate would imply a lower attendance (or employment). Given WE_t, a higher ratio, WE_t/WA_t, would imply a relative lowering of WA_t and a greater demand for EGS employment. Since changes in WA_t may not capture fully

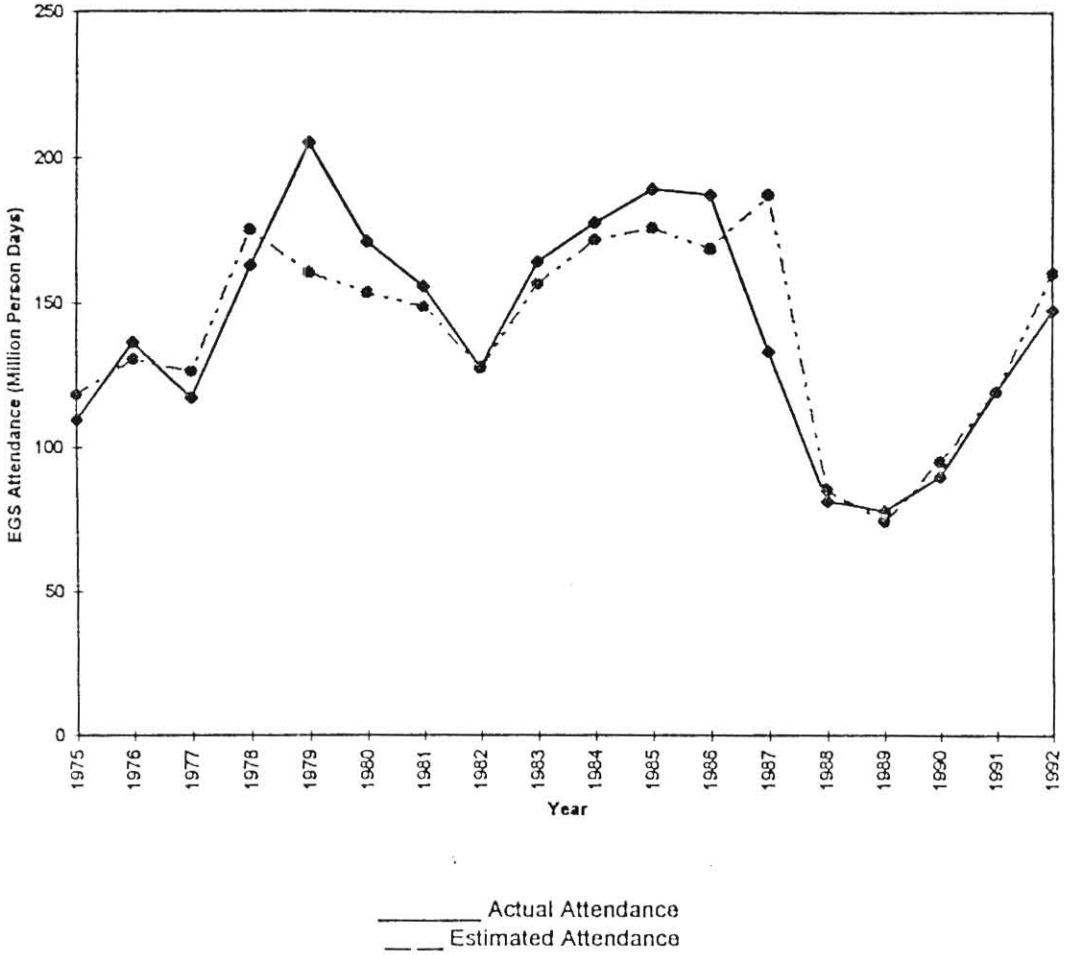


Figure 5. Actual and estimated EGS attendance 1975–1992.

attendance. Given EGS wages, the higher the agricultural wages the lower would be the ratio of EGS and agricultural wages, and the lower would be EGS attendance.[26] The dummy has a negative coefficient, implying that factors other than EGS outlay, EGS wages and agricultural wages had a negative effect on EGS participation in 1988 and 1989.

Since these two years were marked by a good rainfall and a spurt in farm and non-farm activities, it is plausible that slack periods were reduced and the demand for the EGS slackened. Although our results are not inconsistent with the conclusions in Ravallion and associates (1993), the extent of rationing is substantially lower. About 50 percent of the reduction in EGS attendance between 1987 and 1988 was a direct consequence of the lowering of the EGS expenditure and the hike in the wages. Taking this as an approximate measure of rationing, it follows that the extent of rationing was large.[27] But the reduction in attendance due to expansion of farm and non-farm activities was substantial too.[28]

piece-rates cause long delays in payment of wages as assessment of the quantity and quality of work done takes time. Although it is stipulated that wages must be paid once a week or fortnight at the latest, it is not uncommon for wages to be delayed for up to four to eight weeks.[38] More seriously, wages paid are often less than the recorded amount. Given the wage rate, the actual remuneration is substantially lower for the poor because they are (more likely to be) physically less strong and more prone to cheating because of their illiteracy.[39]

In sum, the disincentives to the poor on the benefit side (e.g., delays in payment of wages) may be just as strong as those associated with long delays in offer of EGS work—especially if they are subject to a tight liquidity constraint.

How did the "costs" and "earnings" change for the poor and the non-poor between 1979 and 1989? A definitive analysis is not feasible for lack of detailed data.[40] However, some observations can be made. First, following the EGS wage hike in 1988, the screening mechanism weakened and the EGS became more attractive to the non-poor. As a consequence, some poor were "crowded out." Besides, the rationing mechanisms further disadvantaged the poor. These took the form of longer delays in responding to the demand for work, and restrictions on opening of new work-sites, implying stronger disincentives for the poor. Altogether thus the wage hike in 1988 resulted in a further reduction in the share of poor participants.

VI. EGS WITHDRAWALS AND EARNINGS

The preceding analysis based on aggregate data for the period 1975–1992 pointed to a substantial reduction in EGS attendance as a consequence of expansion of farm and non-farm activities. This issue is examined in greater detail below using the ICRISAT panel data. This is supplemented by an analysis of whether changes in employment prospects also had an effect on EGS earnings.

A. Determinants of EGS Withdrawals

Suppose that an individual who participated in the EGS in 1979–1980 withdrew ($Y = 1$) or did not ($Y = 0$) in 1984–1985. It is hypothesized that a set of factors, such as age, gender, occupation, assets, change in assets, unemployment rate, change in unemployment rate, gathered in a vector, $\mathbf{X}$, explain the decision so that

$$\text{Prob}\,(Y = 1) = F(\boldsymbol{\beta}'\mathbf{X})$$

and

$$\text{Prob}\,(Y = 0) = 1 - F(\boldsymbol{\beta}'\mathbf{X}) \tag{2}$$

The set of parameters, $\boldsymbol{\beta}$, reflects the impact of changes in $\mathbf{X}$ on the probability of withdrawal. Assuming the normal distribution, a probit specification is obtained.[41,42,43]

As data limitations did not permit inclusion of the design and implementation aspects of the EGS, these results focus on a few household and village characteristics impinging on the demand for this scheme. The fact that participation—especially of agricultural laborers who are among the *poorest*—was sensitive to improvements in employment/earnings prospects suggests that many of the poorest withdrew when employment opportunities elsewhere expanded. The presumption therefore that public support (in the present context, the EGS) discourages the poor from engaging in job-search seems unwarranted, if not mistaken.[44]

B. Determinants of EGS Earnings

A tobit model is used to analyze the determinants of EGS earnings. Two separate exercises are carried out for 1984 and 1989 to check whether the coefficients changed significantly over this period.[45]

A tobit model is usually specified in terms of an index function,

$$Z_i = \boldsymbol{\beta}' \mathbf{X}_i + \varepsilon_i,$$

$$Z_i = 0 \text{ if } Z_i^* \leq 0,$$

$$Z_i = Z_i^* \text{ if } Z^* > 0 \text{, and } \varepsilon_i \text{ is } IN\,(0, \sigma^2).$$

Adaptation of this model to the present context is straightforward. If EGS earnings are positive, that is, if $Z_i^* > 0$, $Z_i = Z_i^*$, and $Z_i = 0$ otherwise. This model is estimated using maximum likelihood.[46] The analysis is based on the ICRISAT survey for 1984 and 1989. The results are given in Table 6.

EGS earnings in 1984 were negatively linked to education and to whether the participant was a female, and positively to whether the participant belonged to the more backward village (viz. Shirapur) and to the duration of unemployment. The negative relationship between EGS earnings and education was largely a reflection of lower duration of participation of the better educated participants. While this was a factor in the lower earnings of female participants as well, the more important factor was their larger concentration in less remunerative tasks. Since creches are normally provided, the dependency burden did not have any effect on EGS earnings. The participants from Shirapur worked longer and consequently earned more from the EGS, as also those who experienced longer spells of unemployment.

While most of the variables that possessed significant coefficients in 1984 also had significant coefficients in 1989, the values of the coefficients differed markedly. The coefficient of education, for example, changed from negative to positive. In order to check the equality of the coefficients, the log likelihood ratio test is employed.[47] The estimated χ^2 (9) value, 45.18, is significant at the 1 percent level, implying rejection of the null hypothesis of the equality of the coefficients. As this is a test of the equality of *all* coefficients, nothing definitive can be said about

VII. INDIRECT TRANSFER BENEFITS

A. Relationship between Agricultural and EGS Wages[49]

Ravallion and associates (1993) argue that, if the EGS provides an effective employment guarantee, it will be reflected in a strong relationship between agricultural and EGS wages. Their analysis of monthly data suggests that the short-run impact of EGS wages on agricultural wages is small (for an increase of one rupee in the former, the latter rises by 13 paise). In the long-run, the impact is even weaker (for an increase of one rupee in EGS wages agricultural wages rise by about 9 paise). The existence of a long-run equilibrium wage differential is also assessed by testing for cointegration. The two wage series fail the cointegration test, implying the absence of a long-run relationship between them. The overall conclusion is that there is no more than a slight impact of EGS wages on agricultural wages either in the short or the long-run.

From Figure 1, it is evident that there is a close correspondence between agricultural and EGS wages. However, if they are serially correlated, it would be risky to draw any conclusions about the relationship between agricultural and EGS wages. Moreover, the process of adjustment between the two series may be somewhat complex.

As EGS and agricultural wages *may* be dependent on one another, a Granger-Sims causality test is necessary.[50] Causality is inferred when lagged values of a variable, say X_t, have explanatory power in a regression of a variable, Y_t, on lagged values of Y_t and X_t. An extended specification is employed in which agricultural wages are posited to depend on EGS and non-farm wages.[51] A three-period lag is assumed.

Three null hypotheses are considered : (i) EGS and non-farm wages do not cause changes in agricultural wages; (ii) agricultural and non-farm wages do not cause changes in EGS wages; and (iii) agricultural and EGS wages do not cause changes in non-farm wages. Since only hypothesis (i) is rejected by an F-test (at the 5 percent level), it follows that EGS and non-farm wages *together* cause changes in agricultural wages.[52]

A variant of the dynamic specification in Ravallion and associates (1993), as shown below, is estimated to throw further light on the dependence of agricultural wages on EGS and non-farm wages.

$$WA_t = \alpha + \beta_1 WA_{t-1} + \beta_2 WE_t + \beta_3 WE_{t-1} + \beta_4 WNF_t + \beta_5 WNF_{t-1} + \beta_6 D_1 + \beta_7 D_2 + \varepsilon_t \quad (5)$$

where WA, WE and WNF denote farm, EGS and non-farm wages, respectively, with t as time subscript, and D_1 and D_2 as monthly dummies that take the value 1 for April and May, respectively, and 0 otherwise. In an alternative specification, a linear

Thus, while the EGS has a substantial effect on agricultural wages in the long-run, non-farm activities have a similar effect in the short-run.[53]

Some changes occur with the inclusion of the data for 1989. The results based on this sample are given in Table 8. Comparing the results for specification 1, an important change is that the coefficient of lagged agricultural wages ceases to be significant. Besides, the short and long-run effects of *both* EGS and non-farm wages on agricultural wages are larger. Specifically, if EGS wages rise by a rupee, agricultural wages would rise by about 17 paise in the short-run, and by about 28 paise in the long-run. The short-run effect of non-farm wages (i.e., 21 paise) is again larger than the long-run effect (i.e., 14 paise) but *both* are larger than the corresponding values for the first sample.

The results for the second specification also vary in some respects. The positive time trend ceases to be significant. Also, as in the case of the first specification, the short and long-run effects of both EGS and non-farm wages on agricultural wages are close to those reported above with the first specification but larger than the corresponding values from the first sample.

Table 8. OLS Estimates of Determinants of Agricultural Wages, ICRISAT Sample, 1979–1989[1]

Explanatory Variable	*Specification 1*		*Specification 2*	
	Coefficient	*t-ratio*	*Coefficient*	*t-ratio*
Intercept	11.710	1.027	15.007	1.238
WA_{t-1}	0.007	0.071	0.009	0.083
WE_t	0.166	10.344*	0.170	10.051*
WE_{t-1}	1.109	4.277*	0.113	4.344*
WNF_t	0.211	6.728*	0.205	6.378*
WNF_{t-1}	–0.076	–1.749**	–0.081	–1.833**
T			–0.053	–0.815
D_1	–2.410	–0.300	–3.002	–0.371
D_2	2.823	0.360	2.887	0.367
$\bar{R}^2$		0.9105		0.9105
F		117.360		102.30
Breusch-Godfrey: $\chi^2(3)$		0.793		1.418
N		81		81

Note that the period between 1984 and 1989 is excluded for lack of data.

Note: * Denotes significance at the 5 percent level.
** Denote significance at the 10 percent level.

careful planning and efficient execution, can contribute substantially to both poverty alleviation and rural development in the long-term as well.

VIII. INCOME STABILIZATION

Whether the EGS helped stabilize incomes in rural areas could be inferred from a before-and-after EGS comparison of income variability. However, if significant changes occur in the nature and scale of economic activities over time, account will have to be taken of their impact on income variability. This is often difficult. Usually therefore a before-and-after comparison is supplemented by a with-and-without comparison. One difficulty with the latter is the presumption that the two groups are similar in all respects except the characteristic in question (in the present context, whether an adult member of a household participated in the EGS). Subject to this caveat, a with-and-without EGS comparison of income variability for 1984 is carried out with the ICRISAT data.[59] As the comparison is restricted to a particular year, that is, 1984, the generalizability of the results is somewhat limited. The results, however, are not unimportant for two reasons: (i) since 1984 witnessed a spurt of economic activity in the two sample villages, the income stabilizing role of the EGS is of considerable interest; and, (ii) in any case, the income stabilizing role of the EGS is corroborated over a longer period.[60,61] The decomposition procedure used is described below. Consider a variable, $R_{i,t}$, such that

$$R_{i,t} = L_{i,t} + Q_{i,t} + M_{i,t} \tag{6}$$

where i denotes individual and t refers to year. Variance of R can then be decomposed as follows:

$$\begin{aligned} \text{Var}\,(R_t) = {} & \text{Var}\,(L_t) + \text{Var}\,(Q_t) + \text{Var}\,(M_t) + 2\,\text{Cov}\,(L_t, Q_t) \\ & + 2\,\text{Cov}\,(L_t, M_t) + 2\,\text{Cov}\,(Q_t, M_t) \end{aligned} \tag{7}$$

Differentiating (7) partially with respect to, say, Var (M_t), on the assumption of constant correlations, $\rho_{L,M,t}$ and $\rho_{Q,M,t}$, we obtain

$$\begin{aligned} \frac{\delta\,\text{Var}\,(R_t)}{\delta\,\text{Var}(M_t)} &= 1 + \rho_{Q,M,t}\,\frac{\sqrt{\text{Var}\,Q_t}}{\sqrt{\text{Var}\,M_t}} + \rho_{L,M,t}\,\frac{\sqrt{\text{Var}\,L_t}}{\sqrt{\text{Var}\,M_t}} \\ &> 0 \text{ if } \text{Var}\,(M_t) > -\{\text{Cov}\,(Q_t, M_t) + \text{Cov}\,(L_t, M_t)\} \end{aligned} \tag{8}$$

Similarly, on the assumption of constant correlations, $\rho_{L,Q,t}$ and $\rho_{L,M,t}$,

$$\frac{\delta\,\text{Var}\,(R_t)}{\delta\,\text{Var}\,(L_t)} = 1 + \rho_{L,Q,t}\,\frac{\sqrt{\text{Var}\,Q_t}}{\sqrt{\text{Var}\,L_t}} + \rho_{L,M,t}\,\frac{\sqrt{\text{Var}\,M_t}}{\sqrt{\text{Var}\,L_t}}$$

samples (the F-ratio, 1.88, being significant at the 5 percent level) confirms that incomes varied much less in the sub-sample comprising EGS participating households relative to those in the other sub-sample.

With the help of the results in Table 10, an assessment of the marginal contributions of the variances in the three components of household income is carried out. In each case, the marginal effect is substantial. If, for example, the variance in earnings from cultivation is reduced by a given amount, the variance in household income falls by a multiple of 1.11. The effect of a reduction in the variance in earnings from non-farm activities is slightly larger (as the variance in household income falls by a multiple of 1.16). Compared with the effects of these two components, that of a reduction in the variance in earnings from the EGS is not so large. Since the corresponding multiple is 0.885, a given reduction in the variance in earnings from the EGS is associated with a slightly smaller reduction in the variance in household income.

Although decompositions of household income were also carried out separately for the participating and non-participating *poor* households in 1984, the details are not reported as the sample sizes are small (13 and 18, respectively). Subject to this limitation, two observations could be made : (i) the variance of household income was lower among the EGS households, and (ii) the ranking of the marginal contributions of a reduction in the variances of the three components of household income was identical to that from the aggregate sample, with the lowest rank associated with the EGS. To the extent that this analysis has any validity, the income stabilizing role of the EGS among the poor is corroborated.[62]

Table 10. Impact of Small Changes in Var(L), Var(Q) and VAR(M) on Var(R) in Maharashtra, 1984[1]

Derivative [2,3]	
1. $\frac{\partial \text{Var}(R)}{\partial \text{Var}(L)}$	1.11
2. $\frac{\partial \text{Var}(R)}{\partial \text{Var}(Q)}$	1.16
3. $\frac{\partial \text{Var}(R)}{\partial \text{Var}(M)}$	0.885

Notes: 1. The sample consists of those households which participated in the EGS ($N = 37$).

2. L denotes household earnings from cultivation.
Q denotes household earnings from non-farm activities.
M denotes household earnings from the EGS.
$R = (L + Q + M)$ denotes total household income.

3. $\rho_{L,Q} = 0.175$, $\rho_{L,M} = 0.028$, $\rho_{Q,M} = -0.159$.

In this context, it is significant that some of the poorest withdrew from the EGS when alternative employment opportunities expanded. Although it was difficult to separate those who withdrew because they found better employment opportunities elsewhere from those who were simply pushed out because of the disincentives, it is safe to assert that the former were not a negligible group. If this behavioral response has general validity, the concern for self-support through a (mandatory) work-requirement seems somewhat misplaced. In other words, the poor are likely to go off welfare when suitable opportunities for work exist. More attention must however, be given to ensuring that the barriers/difficulties that the poor face in securing jobs (e.g., limited information, lack of skills, delays in work offers, etc.) are removed.

In conclusion, although a trade-off between work and welfare cannot be ruled out, it need not necessarily be as large as often asserted.

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NOTES

1. The EAS is being implemented in 1752 backward blocks in which the revamped Public Distribution System is in operation. The scheme aims at providing 100 days of unskilled manual work to the rural poor seeking employment. It is funded in the 80/20 ratio by the center and the states, respectively. This scheme operates largely during lean agricultural periods. Part of the wages may be paid in foodgrains. (Government of India (GOI), 1994).

2. Sometimes the effect on agricultural wages is considered a direct transfer benefit (Ravallion, 1991). It may, however, be more appropriate to classify it as an indirect benefit since it accrues also to non-participants over a period of time, depending on whether the EGS adds to the bargaining power of agricultural laborers.

3. For empirical evidence, see Lipton (1983, 1985) In recent years, however, employment opportunities during slack periods have expanded.

4. Despite opposition from rich landlords, the bill passed unanimously in the state assembly, guaranteeing the right to employment to adults in rural areas. (Herring & Edwards, 1983).

23. A more precise statement cannot be made in view of some methodological problems with the Datt-Ravallion analysis (1994). For details, see Gaiha (1996a).

24. As part of the reduction in real EGS outlay was due to inflation, a refinement would be to isolate this effect. (I owe this suggestion to Michael Lipton).

25. Since there was little rationing unconnected with changes in EGS wages and expenditure, the coefficient of the dummy is not likely to be contaminated by it.

26. Note that, since both EGS and agricultural wages involve considerable aggregation, changes over time must be interpreted carefully. Also, as pointed out by Dev (1993), sometimes labor expenses (and consequently wages) are inflated to satisfy the 60:40 norm for labor and material costs in EGS projects.

27. First, assuming that EGS expenditure and wages were unchanged between 1987 and 1988, an estimate of EGS attendance for 1988 is obtained. Second, comparing this with the estimate for 1988 based on the actual EGS expenditure and wages for this year, the reduction in EGS attendance attributable to these two variables is computed. Third, expressing this reduction as a fraction of the reduction between 1987 and 1988, as estimated by equation (1), the estimate of rationing is obtained.

28. Although a definitive explanation of the much lower estimate of rationing in the present analysis cannot be given, it is surmised that differences in the data used, periods covered, and the specification of the determinants of EGS attendance would yield some important clues. For further details, see Gaiha (1996b).

29. Besides, as pointed out by K. Basu in a personal communication, it is not unusual for EGS wage to "adjust" when the demand for the EGS is high and a larger expenditure is infeasible.

30. Whether the relatively low share of EGS participants who were just below the poverty threshold was mainly the result of such participants being pulled up by EGS earnings, as queried by a reviewer, is not confirmed by an analysis of EGS earnings by income. Except for a few acutely poor participants who earned substantial amounts, many earned small amounts. By contrast, many (relatively) affluent participants earned substantial amounts from the EGS. Details will be furnished on request.

31. In the ICRISAT sample, the opportunity cost of time for EGS participants is non-negligible, implying that alternative employment opportunities exist. For illustrative evidence, see Datt and Ravallion (1994).

32. In a recent contribution, Besley and Coate (1992) demonstrate that work-requirement by itself excludes the non-poor from participating in rural public works. The point of the present analysis is that the design and implementation of rural public works matter too.

33. Such evidence as there is—patchy but suggestive—comes from Hirway and Terhal (1994) and Engkvist (1995).

34. That a large share of poor households have zero or negative savings is confirmed by a household survey conducted by the National Council of Applied Economic Research. For details, see Gaiha (1980).

35. Available time allocation data suggest that women spend more time working than men. In Rajasthan villages, for example, in the age-groups 19–34 and 34–44, the total work burden of females was substantially higher (142 percent and 111 percent, respectively). For other corroborative evidence, see World Bank (1991).

36. Typically, those on daily wage contracts are closely supervised. For a formal exposition of the piece rate and daily wage contracts, motivated by some features of rural labor markets in India, see Baland and associates (1996).

37. In the ICRISAT sample, an individual's long-term nutritional status, as proxied by his/her height, has a very strong positive effect on participation, indicating that individuals with better nutritional status self-select themselves into the EGS. For details, see Deolalikar and Gaiha (1993).

38. (a) This is reported in Engkvist (1995). (b) The official explanation is slow disbursal of funds by the Treasury. Irregular flow of funds is a recurring problem but it is not the only causal factor. Gross negligence and rampant corruption have more to do with such delays. (c) An irksome requirement is that wages are paid on a particular day and, in case a participant fails to show up on that day, he/she has

51. Note that non-farm activities exclude the EGS.

52. For details, see Gaiha (1995c).

53. Direct comparison of these results with those in Ravallion and associates (1993) is not feasible as the coverage of the data and specifications vary. Besides, whether the omission of non-farm wages in the latter is partly responsible for the (relatively) small long-run effect of the EGS on agricultural wages is not easy to ascertain in case each of the three wages is measured with an error. Accordingly, a cautious interpretation of the results is warranted.

54. The Gauss-Markov theorem would not hold, for example, because a random walk does not have a finite variance. Hence OLS would not yield a consistent parameter estimator (Pindyck & Rubinfeld, 1991).

55. For details, see Gaiha (1995c).

56. A higher reservation wage may reflect not just current employment options but also expectations of higher earnings in the near future. (I owe this suggestion to K. Basu).

57. Since the ICRISAT survey does not provide any data on EGS projects, an analysis of their benefits was not feasible.

58. The explanation given in Parikh and Srinivasan (1989) is not persuasive: "The major reason for not introducing an explicit labor market is the lack of satisfactory studies of labor supply and demand. After all, even in developed countries robust estimates of labor supply elasticities are scarce" (p. 1). It is of course debatable whether this is sufficient to rule out simple but plausible formulations of the labor market to generate illustrative results.

59. This should not be taken to imply that the before-and-after EGS comparison is considered less important than the with-and-without comparison. Both are equally important as they complement each other.

60. Walker and Ryan (1990) base their conclusion on a comparison of coefficient of variation of incomes of landless labor households in Aurepalle (in Andhra Pradesh), Kanzara and Shirapur (both in Maharashtra), over the period 1975–1984. Since the coefficient of variation was higher in Aurepalle (where the EGS did not operate) than in Shirapur and Kanzara (where the EGS operated), it is concluded that the EGS had an income stabilizing role. It will be interesting to check whether this holds also for EGS and non-EGS households in the Maharashtra villages.

61. An issue is whether a comparison of cross-sectional variances in household incomes can yield any insights into the income stabilizing role of the EGS. The presumption here is that it can. Some elaboration may be helpful. As the households in the two sub-samples are drawn from the same villages, the agro-climatic conditions—an important source of variation in income—are identical for them. Given these conditions, agriculture is a highly seasonal activity with spells of little or no activity. *Annual* household incomes vary depending on whether a household is able to supplement its income from non-farm activities. To the extent that some households do and others do not, some variation in household incomes would be observed. Other things being equal, if another option exists in the form of the EGS, the variation in household incomes would be reduced. The analysis that follows focuses on this aspect of income variability. If this with-and-without comparison is supplemented by a before-and-after comparison, the conclusions will be strengthened.

62. Details will be furnished on request.

63. The summary of welfare reform is based largely on Gueron (1990).

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