

# Planned outlays and Development of Meghalayan Economy

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## Introduction

The developing economies and the less developed regions within them have been suffering from the twin problems of poverty and unemployment. Economic inequalities get accentuated by the development process itself in the earlier phases. The market forces in the short run may prove inadequate to resolve the problems of under-development, poverty and economic inequalities for mitigating which special strategies are required. The policy interventions and direct participation by the public authority in the developmental process may direct the developmental process along the desired path. The levels and patterns of public outlays may be used as instruments to guide and regulate the levels, rates and patterns of growth. This study evaluates the impact of public outlays upon the growth of the Meghalayan economy. The study has developed a simple multiplier - accelerator model of growth which, in combination with a modified production function, puts the rate of growth of output at the base of the long run tendency of spatial developmental inequalities towards convergence or divergence. The study examines, in terms of this model, the inter-relations between the levels and patterns of public outlays upon the magnitude and the direction of the rate of growth of income of Meghalaya. The study covers a period of eleven years from 1975-76 to 1985-86. The data have been obtained from the Directorate of Economics, Statistics and Evaluation, Meghalaya, Shillong.

## Model and Methodology

Development is primarily a temporal aspatial process; and the growth rate constitutes its core. The growth performance of an economy may also be evaluated by comparison of its developmental levels at two point of time. However, the comparative method neglects the time-path and nature of the process of change. The analysis of the factors and the processes that

generate the developmental impulses are also beyond the scope of this method. Such limitations may be overcome by incorporating growth rates in the analytical framework.

Investment may be hypothesized as the major determinant of development in general and the growth of income/output in particular. There exists a fundamental functional relation between investment and the growth of output. The growth of output depends upon investment or upon the growth of capital stock. The growth of output results from the operation of the twin processes of multiplier and accelerator. Multiplier may be related to the propensity to save while the accelerator refers to the reciprocal of capital - output ratio. If  $\beta$  denotes the capital output ratio, we will have

$$\beta = \frac{K}{Y} \dots\dots\dots (1)$$

This can also be expressed as either  $K = \beta Y \dots\dots\dots (2)$   
or

$$Y = \frac{1}{\beta} \cdot K \dots\dots\dots (3)$$

Where  $K$  is capital stock and  $Y$  is income/output and

$$K_t = K_0 + \sum_{t=0}^t I_t \quad (4)$$

Where  $K_t$  is the capital accumulated upto period  $t$ ,  $0$  denotes initial period and  $I_t = dK$  is the amount of investment in period  $t$ .

Differentiating (2) and substituting for  $\beta$  from (i), we will get

$$\frac{dK}{K} = \frac{dY}{Y} \dots\dots\dots (5) \quad (dK = \beta dy)$$

$$\text{or } g = G \dots\dots\dots (6)$$

Where  $G$  and  $g$  are the rates of growth of capital stock and output. Thus, equations (5) and (6) show that the output will grow at the same rate at which the capital stock grows.

Equation (5) can be modified as follows:

$$\frac{dK}{Y} = \beta \frac{dY}{Y}$$

$$\text{Or } r = \beta g$$

$$\text{Or } g = \frac{1}{\beta} r \dots\dots\dots (7)$$

Where  $\beta$  is the investment rate which equals the savings rate in equilibrium. Equation (7) shows that the rate of growth of output is a function of the savings or investment rate. If  $\beta$  is assumed to be constant the relation of proportionality may also be postulated. The equation stipulates that the rate of growth of output equals the product of the average productivity of capital and the rate of investment. Thus, the growth of output will be determined by the twin processes of the multiplier and accelerator. The capital co-efficient and the investment rate are the pivots of growth from which the levels and temporal patterns of development of an economy may easily be discerned.

Generally, output is functionally related to the inputs of labour, capital and intermediate goods used in the production processes; investment in working and fixed capital may also be distinguished. As disaggregated data are not available, outlays on all factor inputs used in the production processes have been considered.

Out-lay refers to public outlays on the developmental projects during the plan periods. But total outlays include private outlays also, but public outlays in India constitute a very large proportion of total outlays. Development in less developed regions has been initiated and nurtured mainly by public outlays. All the same, outlay figures will be under estimated if public outlays, alone are considered. We could remedy it by either adding private outlays to these figures, or the output may be reduced by that amount which originates in the private sector. But such adjustments are not likely to alter the results qualitatively though the parametric estimates will decidedly change in magnitude.

Rising factor productivities play the pivotal role in the developmental process as the technological base of the economy is upgraded. The factor productivities at the average level and at the margin reflect the nature of the returns to scale under which production takes place. The marginal and average productivities/coefficients of the factor inputs are equal in equilibrium when output is at its optimum level. At this point, production takes place under constant returns to scale. But production will be subject to increasing of decreasing returns to scale according to as  $m < a$ , where 'm' is the marginal

and 'a' is the average productivity of outlay. Outlay elasticity of output denoted by  $e$  may also be used for this purpose. Production processes will show increasing, constant and decreasing returns to scale according to as  $e > 1$

The outlay elasticity of output and the productivities of outlays may be estimated from the following modified production function:

$$\log Y = L + e \log O \dots\dots(8)$$

Where  $O$  denotes total outlays. The function has been estimated by the OLS method. The usual assumptions of the OLS estimators have been adopted. Equation (8) furnishes us the following inter relations between the outlay productivities and the elasticity:

$$e = \frac{O}{Y} \cdot \frac{dy}{dO} \dots\dots\dots(9)$$

$$\text{Or } \frac{dy}{dO} = e \cdot \frac{Y}{O} \dots\dots\dots$$

$$\text{Or } m = a \cdot e \dots\dots\dots(10)$$

Equation (9) shows  $e$  to be the outlay elasticity of output, while equation (10) shows that the marginal productivity equals the product of average productivity at geometric mean level and the outlay elasticity of output.

As  $a = \frac{1}{\beta} = \frac{m}{e}$  ..... equation (7) may also be written as

$$g = a \cdot r \dots\dots\dots(11)$$

$$= \frac{1}{e} m r \dots\dots\dots(12)$$

Thus, the equation (12) combines the multiplier - accelerator with the modified production function analysis for determining the growth of output.

2. If different factor inputs are distinguished in the production function, sum of outlay elasticities of output will show the returns to scale in operation. As we have considered outlay on factor inputs together, single outlay elasticity co-efficient will perform this role.

## *Empirical Results*

The rates of growth of outlay and output and the pattern of sectoral allocation thereof have been derived both in constant and current prices. The estimated rates are reported in tables 1 and 2.

### *Growth in Nominal Terms*

The Nominal Net Domestic Product has increased by 4.62%. The index of state's Net Domestic Product relative to that of the nation has declined negligibly to 0.161% from its base year value of 0.168%. Thus, the states economy has maintained its relative position, by and large, during the fifth and sixth five year plans.

But, is this growth performance commensurate with the developmental efforts ?

Total outlay during these plan periods may reflect the overall developmental efforts of the state. The outlay has increased by 7.87 % which is 1.7 times the rate at which income in current prices has increased. It suggests that the production processes have been characterised by the diminishing returns. This particular feature of the growth process may be accounted by one/some/all of the following factors:

- 1) Unchanging technology;
- 2) Sub-optimal or extra-optimal scale of operation; and
- 3) inappropriate sectoral pattern of allocation.

### *Sectoral Growth*

The outlay on primary sector has increased by 6.34% while the outlays on secondary and tertiary sectors have increased 6.45% and 8.24%. The differences of these growth rates are not significant statistically, but the share of the tertiary sector has been disproportionately large. The shares of the primary and secondary sectors in total outlay have declined by 2.07% and 1.42% respectively, while the share of the tertiary sector has increased by 0.37%. The shares of primary and secondary sectors in total outlay do not differ from each other statistically, but their growth has been significantly different from that of the tertiary sector. Then the growth of even the tertiary sector seems to have been dominated by the growth of administrative services,

which are expanded more rapidly than the productive infrastructural facilities. This highlights the possibility of the state's economy converging towards an office economy. The long run growth can be sustained only by the strengthening of the productive sectors the economy. The disproportionate growth of services has however, been a feature of the growth of the national and other regional economies also.

### *Growth Performance In Real Terms*

The 1970's have been marked by unabated inflationary pressures. As inflation has affected the regional economy of North-East India more deeply than the national economy, the growth in nominal terms may overestimate the real growth. Growth has in real terms therefore been evaluated.

Output in real terms has increased at 1.08%. This is much lower than the growth of nominal output. This difference of 3.56% between the rates of growth of nominal and real output reflects the inflation rate. As against this, outlay in real terms has increased at 4.38%. Thus, the outlay is required to grow four times more rapidly than the output. This can hold only if production processes operate under diminishing returns. Thus, the growth of both the nominal and real output has been subject to the diminishing returns.

If increase in population is also considered, economy may show even negative growth. Both price rise and the population growth may be neutralised if we measure the values in real per-capita terms. The per-capita outlay in real terms has increased at a significant rate, of 3.6 percent. As against this, the per-capita output in real terms has declined at a statistically negligible rate of 0.04 percent. Whereas the, population growth has reduced the growth of real outlay by 0.77 percent only, it has completely swamped growth of real output. This highlights the urgencis of the need for population control.

### *Sectoral growth*

These results seem to emanate partly from the

pattern of resource allocation. The real outlay on the primary and secondary sectors has increased by 3.4 and 2.8 percent, while the outlay on the tertiary activities has increased by 4.7% per annum. Consequently, the relative shares of the primary and secondary sectors have declined by 1 and 1.6 percent, but the share of the tertiary sector has increased at a rate of 0.31%. This supports the hypothesis of the dominances of the growth process by the tertiary sector.

### *Productivity of Outlay and Returns to Scale*

The tendency of output to grow proportionately less than outlay which has been revealed by the growth rates, has been further examined by means of the modified production function. The outlay elasticity of output in current prices is only 0.50. This points towards the probability of the production process operating under the Diminishing Returns. The average productivity of outlay at geometric mean level is approximately 2, while the corresponding marginal productivity is only 1. Thus, the average productivity of outlay is twice as large as its value at the margin. This supports the hypothesis of the production processes being subject to diminishing returns to scale. In case of the output and outlay in real terms. The tendency of diminishing returns is operating even more sharply. The outlay elasticity of real output is only 0.2. The average productivity is still approximately 2.0, whereas the marginal productivity is only 0.38. The real values are much lower than the corresponding nominal values of output elasticity and the marginal productivity of outlay. Thus, there is overwhelming empirical evidence to support the hypothesis that production is taking place under diminishing returns.

### *Dominance of Tertiary Sector*

The dominance of the growth process by the tertiary sector may probably explain this phenomenon. The growth of sectoral output and outlay in nominal terms for the period 1979-80 to 1985-86 has therefore, been worked out. Whereas output of the primary goods has increased by 4.98 percent, the outlay has expanded

by 5.4 percent. The output and outlay of the secondary sector have increased by 5.05 and 5.45 percent respectively. Thus, the production of both the primary and secondary goods seem to have been subjected to the mild operation of the decreasing returns to scale. But the output of the tertiary sector has increased by 7.67% while the outlay has increased only by 5.06 percent. This suggests that the tertiary sector has been operating under the increasing returns to scale. The primary and secondary sectors alone must therefore, account for the overall diminishing returns to scale. This can be obviated by the induction of new techniques and new goods into these sectors. This facet of the growth process may also account for the dominance of growth by the tertiary sector.

The dominance of the tertiary sector in the growth process may be explained by the following factors:

- 1) Efforts have been made to enable the public sector to assume the commanding heights of the economy. This has meant disproportionate growth of the administrative services and bureaucracy.
- 2) The diffusion of the state supported development has warranted widespread diffusion of the administrative infrastructure.
- 3) Reorganisation the fragmentation of bigger states and the division of larger districts and other administrative units into smaller units have further accentuated the above trend.
- 4) The philosophy that the creation of and the expansion of the existing economic infrastructure has to precede the economic development in general and industrialisation of less developed regions in particular has also contributed to the disproportionate growth of the tertiary sector.
- 5) Productivity of investment and scarcity of resources have made it imperative to adopt the strategy of developing selective sectors of the economy and a few regions of the country. The approach of selectivity has been designed to push the actual growth nearer to its optimal level. But the pursuance of the objective of reducing the regional and personal inequalities have persuaded the policy makers to spread the impulses of growth far and wide through the social services, like health

and education Infrastructural facilities like banking, insurance, transport, communication, irrigation, power etc. have also been envisaged to act as the levellers of the existing regional inequalities.

(b) Controls, permits and licenses as the tools of planning the development of a mixed economy has led to the multiplication of the bureaucracy at all the levels of the administration.

### *Nominal Ratios*

Production function is also analysed in terms of inter-relations between output-capital and labour-capital ratios. An analysis of these ratios may highlight certain facts of the growth process. Therefore, the growth of output-outlay, output-labour and labour-outlay have been ratios examined. The overall average productivity of outlay has increased at a rate of 3.64 percent. But is not significant statistically. The output-labour ratio has hereover, significantly by 3.17 percent, while the labour-outlay ratio has declined significantly by 6.8 percent. Thus, the outlay per unit of employment has been consistently declining. The employment must have been increasing more rapidly than outlay. Successive dozes of outlay must have either making the techniques in use more labour intensive or new techniques with higher labour intensity must have been inducted into the economy. Therefore, the elasticity of output per unit of outlay with respect to employment per unit of outlay has a value of only 0.58 which implies that there operates the law of diminishing returns to scale.

The strategy of generating more employment per unit of outlay may be in consonance with the socio-economic objectives of alleviating the poverty and unemployment through the developmental projects. But it has retarded the growth of the economy. For rapid and optimal growth of the economy it is desirable to induct such new techniques and products as may be conducive not only to the generation of more employment opportunities but are also capable of leading the economy on to its optimal growth path. Primary and secondary sectors of the economy should have high priority as only then the production base of the economy will be strengthened and the tendency of the diminishing returns discernible in these sectors may

be blunted and even be reversed. This will also achieve the objective of making the tertiary sector subservient to the needs of the primary and secondary sectors.

### *Ratios in Real Terms*

As the inflationary process has substantially reduced the growth of output and outlay in real terms, the growth of the ratios in real terms has been evaluated. The ratios in real terms have been falling consistently at significant rates of 3.64, 3.73 and 3.44 percent. This also supports the hypothesis of production being subject to the diminishing returns. The inference that more employment is generated per unit of nominal outlay has also been reversed. Like output, employment per unit of real outlay has been declining consistently through time.

### *Structural Break*

As each five year plan of development tends to differ in (i) size (ii) specific objectives and (iii) objective specific strategies, each plan period may structurally be different from all the preceding ones. It may be detected by the dummy variable technique. The estimated functions, both in nominal and real terms, show that the intercepts for the fifth and sixth plan periods are significantly different which reveals a structural break between the two periods. The desirability of separate analysis of each plan period is thus highlighted. One difference is immediately discernible : Outlay in current prices during the fifth plan period has increased more rapidly than output whereas output in current prices during the sixth plan has expanded more rapidly than outlay. Thus, the tendency of the diminishing returns to scale operating during the fifth plan period has been reversed subsequently. This is the consequence of the deceleration of the growth of outlay and the acceleration of the growth of output during the sixth relative to the fifth plan period. Both these properties hold for the growth of outlay and output in real terms also. In fact, the real outlay in sixth plan has increased at a rate approximately half of the rate at which real outlay during the fifth plan period has expanded. But real output during the sixth plan period has increased at more than twice the rate at which it has increased during the fifth plan period. The real output during the

sixth plan period has been produced under the increasing returns to scale. Thus, the economy has overcome the debilitating effects of the diminishing returns upon the growth of income. These healthy trends need strengthening during the ensuing plan periods.

### Conclusions

The major findings of the study are as follows:

1. The economy of Meghalaya has developed at a rate comparable to the national rate of growth both in nominal and real terms. Therefore, the state domestic product relative to the national product has remained, more or less, invariant. The distance between the national and the state economies has neither increased nor decreased.
2. Compared to the growth in nominal terms, the growth in real terms is extremely low. This reflects the high incidence of inflation. However low the growth in real terms might have been, the economy seems to have succeeded in breaking the stranglehold of stationarity. All the same, the low level of growth in real terms suggests that the growth of outlay has been just sufficient to maintain the state economy on a low equilibrium income level. This highlights the need for accelerating the growth process.  
Most of the developmental efforts have been dissipated by the intensive price spiral and the operation of diminishing returns to scale. The explosive population has completely swamped the growth in real terms.
3. The growth of output of the primary and secondary commodities has been characterised by the diminishing returns, while the growth of output of services has got the benefits of the increasing returns to scale.
4. The growth process has been dominated by the growth of the tertiary sector, especially the administrative services.
5. There is a structural difference between the fifth and sixth plan periods. During the later period, the changed strategy of development has reversed the direction of the returns to scale. But there remains an urgent need to induct new production techniques and new products into the primary and secondary sectors of the economy so that the diminishing returns may be averted and the economy could be sufficiently diversified.

Table - 1

## Estimated Growth Rates in Nominal Terms

	Intercept	Slope Growth Rate	R <sup>2</sup>	t values
1. Total N.D.P.	3.9525446	.0461563	.9612051	14.932827
2. Total outlay	3.1952088	.0786516	.9853064	31.715218
3. Output-Capital Ratio	.081973	.0363771	.6956877	1.9215727
4. Output-Labour Ratio	.6327327	.0316679	.9817078	21.977575
5. Labour-Capital Ratio	1.1512335	.0680455	.9511533	-13.238132
6. Growth Rates of Sectoral outlay				
6.1. Primary Sector	2.5674885	.0633505	.9855381	33.02085
6.2. Secondary Sector	1.8976505	.0644517	.9509852	17.619382
6.3. Tertiary Sector	3.0912587	.0823672	.223213	2.1442198
7. Growth Rates in Sectoral Proportions of outlay				
7.1. Primary Sector	1.0210262	-.0206528	1.002187	9.4424209
7.2. Secondary Sector	.6745311	-.0141586	.370788	3.070608
7.3. Tertiary Sector	1.8683881	.00371506	.6070837	4.9643776

Table - 2  
Estimated Growth Rates in Real Terms - 1975-1986

	Intercept	Slope (Growth rates) _ .0107568	R <sup>2</sup>	t values
1. Total N.D.P.	3.7773416		.3800276	2.3487784
2. Total Outlay	3.1480686	.0437864	.9537311	16.369683
3. Per-Capital N.D.P.	2.7154587	-.0004346	.0106	.1031779
4. Per-Capital outlay	2.2021523	.0359697	.8804634	8.5823335
5. Growth rates of sectoral outlay				
5.1. Primary Sector	2.4977868	.034167	.9230743	12.489757
5.2. Secondary	1.8379418	.0282285	.7305973	6.1617245
5.3. Tertiary	3.0107241	.468528	.932822	13.435613
6. Growth rates in Sectoral proportions of outlay				
6.1. Primary	1.1958206	-.0096197	.3824253	-2.8372574
6.2. Secondary	.6901181	-.0155917	.3452238	-2.6180291
6.3. Tertiary	1.8626387	.00306803	.377713	2.9150932
7. Output-Capital Ratio	.5185277	-.036405	.6958583	-4.5377823
8. Output-Labour Ratio	-.6064166	-.0373181	.8738527	-8.4466058
9. Labour-Capital Ratio	1.3373098	-.0343867	.9814869	-22.048999

Table - 3  
 Estimated Growth Rates during the 6th Five Year Plan period (1980-1986)

	In Nominal Terms			In Real Terms				
	Intercept	Slope	R <sup>2</sup>	t - Values	Intercept	Slope	R <sup>2</sup>	t-Values
1.Total P.	4.1100789	.0649333	.9993756	80.014006	3.7258555	.0364809	.9788317	13.600102
2.Total Y	3.9776055	.0512192	.297177	5.907774	3.7740249	.0227182	.7112504	3.138925
3.Growth Rates of Sectoral N.D.I								
3.1.Primary	3.7498029	.0497776	.9962474	32.587432	3.697774	.0481129	.924742	5.7431591
3.2.Secondary	2.7567065	.0505412	.937908	7.7731543	2.7556105	.0503216	.901198	9.56348
3.3.Tertiary	3.827624	.0765078	.9735685	12.138146	3.79728	.0695831	.958263	13.21649
4. Growth Rates of Sectoral Outlay								
4.1. Primary	3.119416	.0532417	.9502909	8.7446074	3.219332	.0228174	9402831	6.987645
4.2.Secondary	2.4092375	.0545258	.9126111	6.4631591	2.419373	.023286	.923417	7.737432
4.3.Tertiary	3.8989254	.0506607	.8812077	5.4472244	3.817914	.0205173	.832468	8.746349

Table - 4  
Estimated Elasticities and Productivities

	<u>Intercept</u>	<u>Elasticity</u>	<u>R<sup>2</sup></u>	<u>t</u>	<u>F</u>	<u>P</u>	<u>d</u>	<u>Marginal Productivity</u>	<u>Average Productivity</u>
1. Output Elasticity of outlay									
1.1. At Current prices	2.2613151	.5009018	.8990373	8.8613266	35.618698	.482787	9965575	.999968	1.9963355
1.2. At constant prices	3.1691494	.1899418	.2463442	1.8405439	1.3078148	.2448275	1.5193449	.3790689	1.9957112
2. Elasticity of output with respect to Employment									
2.1. At Current prices	-1.1309	.5802946	.997631	7.4913627	24.942429	.476801	1.0463978		
2.2. At Constant prices	-1.1306517	1.2650425	.9359065	11.46385	58.408825	.263948	1.472104		

## Notes & References

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