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PUBLIC EXPENDITURE ON EDUCATION AND ITS DETERMINANTS IN MIZORAM, INDIA

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Abstract
Education is a 'public good' in that both the individuals and the society benefits from increased education. However, market failure in its provision, especially in remote villages, necessitate public investment to ensure equity and equality of opportunity. Attempt is made in this study to analyse the growth of public investment in school education in the state of Mizoram, India. It was observed that there has been a commendable growth of public investment through budgetary expenditures on education, both in current and constant prices; while this is positively correlated to by an improvement in number of schools, teachers, and enrolment. The near unitary elasticity of expenditure per pupil of primary education with respect to enrolment, teachers, and schools may be taken to mean the existence of enough room for improvement of primary education through public investment. The magnitude of public expenditure was found to be highly volatile to demographic changes, while it is less than proportional to the state budget and GSDP. Thus, it is necessary to scale up the budgetary shares of education to ensure faster and sustained development in which human capital plays the central role.

Key Words: Public Expenditure, Elasticity, Investment, Education.

Introduction

Planning for economic development involves not just the allocation of a country's available resources for the production of goods and services but also the development of its educational system so as to produce the right type of skilled manpower and in requisite numbers. Education, like other forms of investment in human capital, can contribute to economic development and raise the incomes of the poor just as much as investment in physical capital, such as transport, communications, power, or irrigation (Psacharopoulous and Woodhall, 1985). Regarded as one of the most vital constituents of knowledge industry (Machlup, 1962), it enriches people's understanding and improves the quality of their lives, and yields direct and indirect benefits both to individuals and to society. The most obvious direct benefit is that educated workers receive incomes higher than those who are less educated (Bolaji and Kikelomo, 2013). Thus, the direct benefit of education for individuals is higher lifetime earnings; and for the society, it is the higher productivity of educated workers and the additional contributions to national income over their entire working lives. Education also yields a set of indirect benefits known as externalities that are not immediately captured by the individual and are extremely difficult to measure empirically (Sianesi and Van Reenen, 2000).

Education provides a foundation for development, the groundwork on which much of our economic and social well being is built (Omoniyi, 2013). It is a key to increasing economic efficiency and social consistency as a strong and positive relationship exists between investments in human capital and economic growth (Vishwanath et al., 2009). By increasing the value and efficiency of their labour, it helps to raise the poor from poverty and increases the overall productivity and intellectual flexibility of the labour force (Ozturk, 2001). Also, this type of investment has strong influence on the growth of start-ups (Moog, 2002). It thus helps to ensure that a country is competitive in world markets that is now characterised by changing technologies and production methods. As such, education contributes to socio-economic development in various ways. It helps in the industrialisation of a country by providing manpower that possesses professional, technical, and managerial skills. It creates and changes the attitudes and aspirations of the people which are necessary for the socialisation, modernisation, and overall transformation of societies. Most importantly, education helps in the absorption and dissemination of knowledge through teaching and research. It allows people to enjoy an enhanced 'life of mind' offering the wider society both cultural and political benefits (Stella and Gnanam, 2003). Therefore, no country would be able to achieve constant economic development without considerable investment in human capital. It is also believed that a higher investment in education would automatically lead to economic growth and that, if countries want to spur growth through investment in human capital, they cannot invest indiscriminately (Judson, 1998).

As stated, education increases the earnings of individuals by directly and positively affecting their productivity. The more education they acquire, the better they are able to absorb new information, acquire new skills, and familiarise themselves with new technologies. Higher levels of productivity reflect higher levels of human capital, which are in turn primarily a result of increased education (Becker, 1962). Thus, a positive relationship exists between education attainment and earnings. Therefore, it is no surprise that education is widely accepted as one of the leading instruments for promoting economic development as it facilitates the acquisition of new skills and knowledge, and frees up resources to create new technologies, new business, and new wealth, eventually resulting in increased economic growth (Shultz, 1960). Concurrently, public

expenditure on education is of great importance to any national development and plays a critical role in promoting growth and equity, and through both channels, help reduce poor quality as well as improving standard of education (Edame and Eturoma, 2014).

One of the strongest and most often used arguments for investment in primary education is the economic argument based upon the human capital (Boissiere, 2004). Education is a 'public good' in that the society benefits from increased education as well as the individuals. However, the problems faced in many developing countries are the failure of the market (private investment) to provide such public goods among all citizens, especially in the remote areas of the country. In other words, if education was provided under market conditions, only those who could afford to pay tuition fees would enroll. Not only would there be underinvestment from the social point of view, but income inequalities would be preserved from one generation to the next since education is itself a determinant of lifetime income (Foster, 1987). Therefore, an argument for public subsidy of education is one that of equity and equality of opportunity. Another point used to justify public expenditure of education has to do with externalities (McMahon, 1987). Since the social benefits of education exceed private benefits, governments subsidise education to prevent underinvestment. In addition, many also believe that education is subject to economies of scale and thus that it is more efficient to finance and provide education publicly (Chakraborty et al, 1996). Even in some countries where the government is unable to meet the increasing social demand for education particularly in higher education, the domination of the private sector might contribute to other problems such as deterioration in quality of education (Tilak, 1994). Thus, public investment (expenditure) towards educational development must be considered the key component to cover each and every section of the society for human resource development.

In light of the various issues put forwarded, this paper attempts to present the growth of government (public) investment on education in Mizoram while at the same time identifying the determinants of public expenditure on education by passing it through a log-linear regression model, which possesses a functional form, so as to test the variables of their significance on public educational investment. The required data are obtained from the various budget documents of the state government, various issues of Economic Survey, and records of the education department. To convert the various budgetary figures into constant terms the different series of wholesale price index (WPI) of the Office of the Economic Adviser, Ministry of Commerce, Government of India, converted into one series with common base year (i.e. 1981-82=100), was adopted.

Progress of School Education in Mizoram: Overview

Although Mizoram was accorded to full fledge state only in 1987, there has been commendable progress on school education, and the state has become the second most literate among the Indian states. Table-1 presents the growth of school education in Mizoram in terms of number of schools, enrolment, and teachers separately for primary, middle, and high schools. Primary school enrolment have increased by almost two times after 1987-88 with a compound annual growth rate (CAGR) of 27.9 percent, while middle school and high school increased at a CAGR of 26.6 percent and 25.9 percent respectively during the same period. At the same time, the number of school has also shown significant increase at 4.3 percent, 7.7 percent, and 7.9 percent respectively for primary, middle, and high school. The increasing trend of these parameters necessitates further budgetary expenditure on the part of the state government.

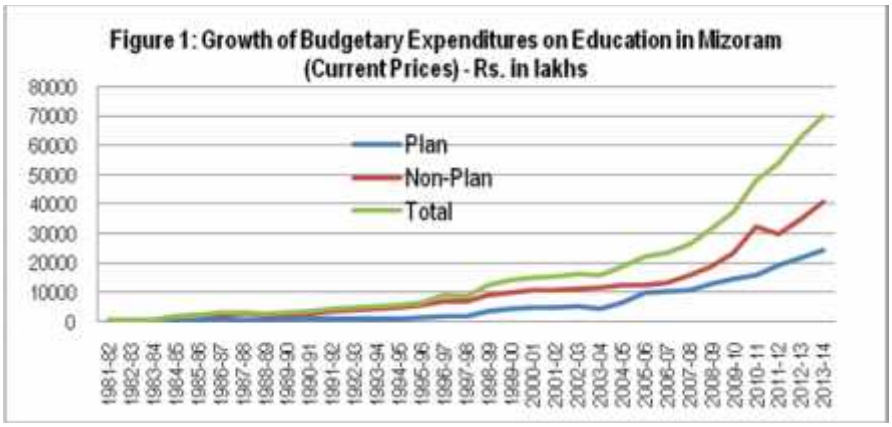
Table-1: Growth of School Education in Mizoram

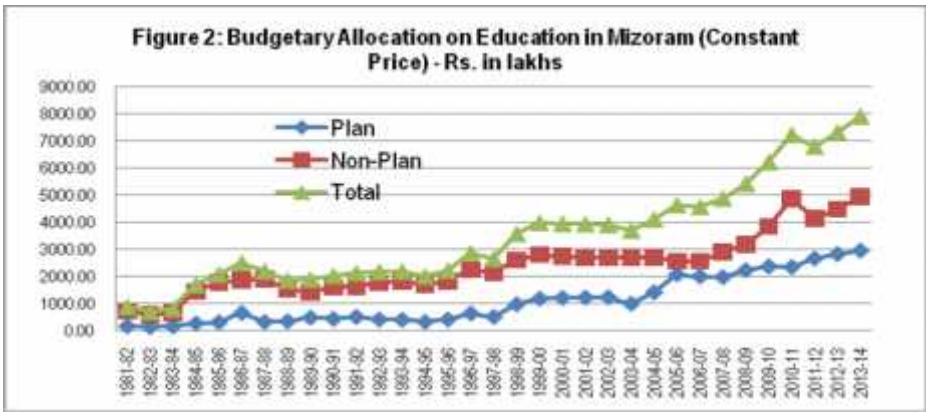
Year	Primary			Middle			High School		
	No	**Enrolment**	**Teachers**	**No**	**Enrolment**	**Teachers**	**No**	**Enrolment**	**Teachers**
1987-88	1033	86842	3934	477	35020	2814	162	18356	1192
1988-89	1127	91256	3664	509	39516	3084	194	21590	1310
1990-91	1105	103686	3677	544	44137	2365	202	27,287	1,486
1993-94	1082	97550	4012	609	44969	3738	281	27784	1839
2001-02	1377	116226	5429	851	53130	5747	370	43030	2853
2002-03	1504	116303	5855	911	56490	5599	409	39875	2923
2003-04	1504	120217	5861	908	58623	5608	443	45200	3108
2004-05	1481	102807	5969	939	56038	7067	448	43161	3592
2006-07	1700	130342	8099*	1,081	58533	7271	502	44322	3768
2007-08	1752	134656	8002	1090	57399	6846	508	43675	3935
2008-09	1783	151899	8716	1253	64887	7754	502	44576	3886
2009-10	1782	156396	8477	1313	66776	7564	521	48811	3853
2010-11	1821	166152	8310	1353	69318	7824	528	50252	3870
2011-12	1855	164272	8488	1383	87726	9638	543	48741	4212
CAGR	**4.3**	**27.9**	**7.3**	**7.7**	**26.6**	**8.5**	**7.3**	**25.9**	**7.9**

Source: Directorate of School Education, Government of Mizoram

Public Expenditure on Education in Mizoram

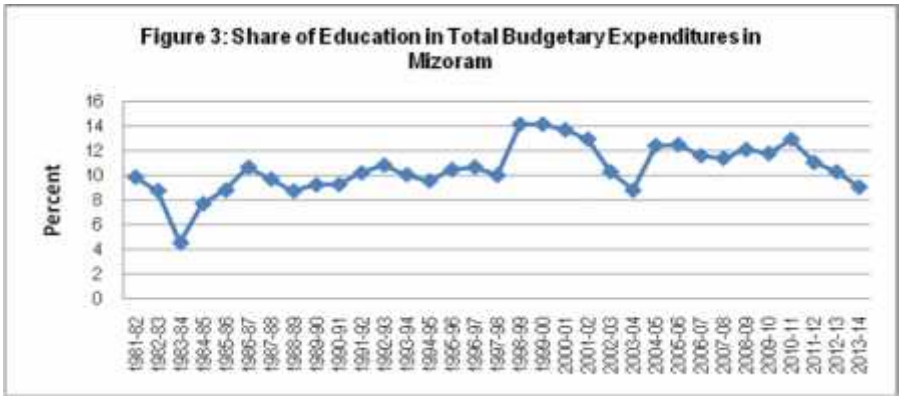
The Government of Mizoram has shown significant efforts to promote education. This is evident through its budgetary investment to provide education to the people. The total budgetary allocation for education, at current prices, significantly increased from Rs.902.53 lakh in 1981-82 to Rs.70212.08 lakh in 2013-14. Figure 1 and Figure 2 presents the trend of budgetary allocation on education since 1981-82, separately for plan and non-plan expenditures, at current and constant prices. It can be observed that there has been a continuous increase in government expenditure for education throughout these years both in current and constant prices. However, as it was felt that an examination of its trend after accounting for inflation would give a more realistic picture, WPI (1981-82=100) was adopted to deflate the budgetary expenditures at current prices to find the same in 1981-82 prices. It can be observed from the figures that there is an increasing trend of expenditure on education in terms of current and constant prices. Thus, it is safe to conclude that there has been an increase in public investment for education in Mizoram for the last 30 years under study.

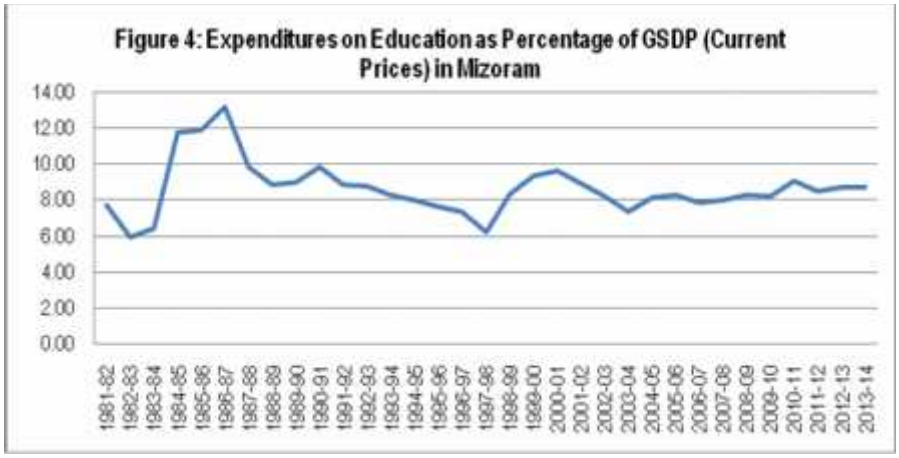




It may be noted that non-plan and plan expenditures are usually meant for maintenance of existing establishment and for developmental activities, respectively. The increasing trends of both plan and non-plan expenditures may be taken to denote that there is continuous increase in developmental expenditures as well as for the existing state of facilities in Mizoram. Centrally sponsored schemes for education, like Sarva Shiksha Abhiyan (SSA) and Rashtriya Madhyamik Shiksha Abhiyan (RMSA), are under plan expenditures as they are primarily meant for improvement and development of the educational infrastructures in Mizoram.

Moreover, the compound annual growth rates (CAGR) of expenditures are 16.83 percent and 12.1 percent for plan and non-plan expenditures, respectively. In constant term, plan and non-plan expenditures are increasing at the rate of 9.38 percent and 4.95 percent respectively. Thus, it may be concluded that there has been substantial annual increase in government expenditures on education since 1981-82, both in current and constant prices. It is interesting to note that the CAGR of plan expenditure is significantly higher than non-plan expenditure. This may mean that significant improvements in the existing as well as new additions have been made in Mizoram annually keeping in view the nature and purpose of plan expenditures. The main contributor for the spurt of plan expenditures would be the introduction of SSA and RMSA as flagship programmes of the central government since the start of the new millennium.





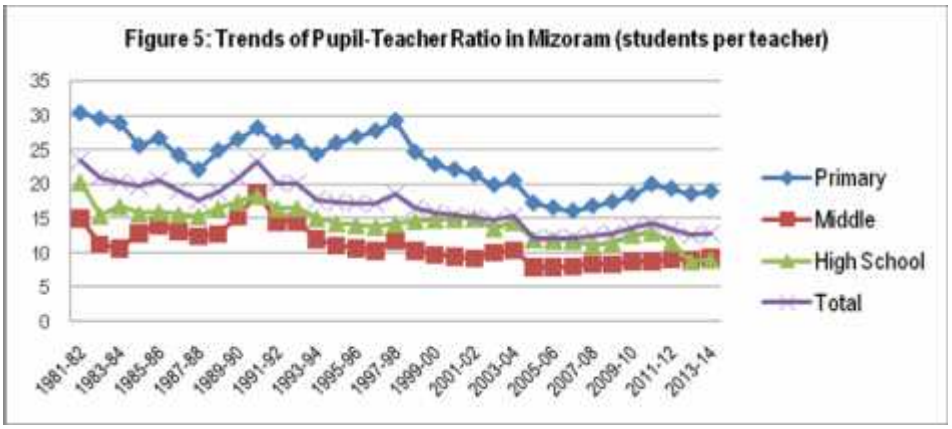
Importance given to education by the government can be observed from its share in the total budget, as presented in Figure 3. Taking into consideration the existing number of government departments (more than 40) which are allotted separate budgets, education occupies an important position across the period under study. With the exception of significant fall during 1983-84 and 2003-04, the percentage share of education on total budget hovers around 10 percent. Another area of academic interest is the effort of the state government to enhance its expenditure according to the need and compulsion of economic development. The apparent development indicator for the state is the Gross State Domestic Product (GSDP). The expenditure on education as a percentage of GSDP significantly increased from 1982-83 to 1986-87 to the extent of more than 12 percent. This is presented in Figure 4. Interestingly, the peak period was when the state attained statehood. However, it decreased to its normal trends of 6 to 10 percent, but had recently experienced an increasing trend. In summary, public expenditure for the provision of education in Mizoram is substantial when taken as a percentage of GSDP, which otherwise can be stated as it being increasing with the pace of development in the state.

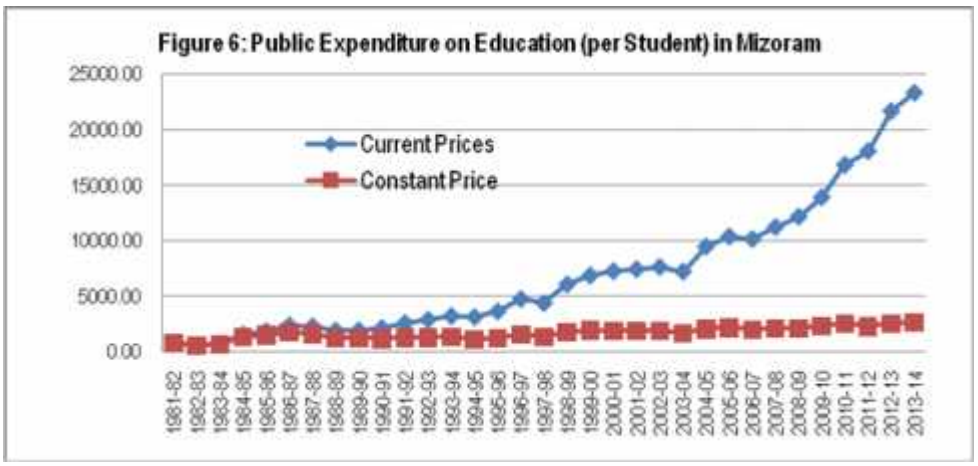
Public Expenditure on Education per Student

Having analysed the trends of public expenditure on education in the preceding section, it is an interest to analyse the trends of expenditure per student during the study period. The key variables for this analysis are total expenditure (current and constant prices), total students' enrolment, and the number of teachers. While it is desirable to have longer period for trend analysis, the data available for higher secondary, college, and other educational institutions are no more than of recent years. Thus, this paper focused on the enrolment rate and number of teachers only up to the high school level (which may be called 'school education') so as to ensure uniformity of data and a longer time period. Since the contribution of school education on all indicators to total budget expenditure on education is excessively high (more than 75 percent) in comparison to other institutions (higher secondary, college and technical), unit expenditure of school education is expected to be the best indicator for the entire education sector in Mizoram. In addition, it should be noted that interpolated values were computed for the years where there is no official record in respect to the variables of interest.

To clearly understand the general trends of expenditures per student, it was considered pertinent to present the increasing availability of teacher per students (pupil) over the years side by side with the increasing public expenditures. In Figure 5 and

Figure 6 are presented the trends of student-teacher (pupil-teacher) ratio and public expenditure per student since 1981-82 till 2013-14.





It can be observed from Figure 5 that number of teachers per student have increased continuously in Mizoram since 1981, as indicated by the declining student-teacher ratios. This should be taken as an achievement of the state government in providing education services to the people as the number of teachers available per student has increased. The student-teacher ratios declined from 23.49 students per teacher in 1981-82 to 12.83 in 2013-14 at declining annual compound rate (i.e. CAGR) of -1.88 percent per annum. At present, the pupil-teacher ratio is lowest in case of high schools and highest in primary schools. Thus, the availability of teacher per student is lowest in primary level education in Mizoram while it is highest in high school.

At the same time, it can be seen from Figure 6 that there has been a gradual increase in public expenditure per student of school education in Mizoram both in current and constant prices with CAGR of 10.52 percent and 3.04 percent respectively. The per capita public expenditure increased from Rs.738.07 in 1981-82 to Rs.23299.18 in 2013-14, while it increased from Rs.738.07 to Rs.2625.55 at constant price during the same period. It may thus be concluded that there has been a significant rise in budgetary expenditure in consonance with the increasing demand and economic development of the state.

Determinants of Public Expenditures on Education

As it was observed that there was a significant increase in public education expenditure during the last 30 years, it was felt necessary to analyse the factors that determine it. The significant determinants of public expenditures on education are economic development, number of students, magnitude of demography, and public social expenditures (Edame and Eturoma, 2014; Fernandez and Rogerson, 1997; Busemeyer, 2007; etc). On the basis of the data series available, the study examined the significances of population (demography size), total budget, Gross State Domestic Product (GSDP), number of students (enrolment), number of teachers, and number of schools in determining the total budgetary investment/expenditures on education in Mizoram. As population size is available only in Census years, interpolated values as per the decadal growth

rates were computed for the remaining years. Their significance for plan and non-plan expenditures was also tested separately. It may be noted that the term public expenditures and public investment are taken as analogous in the analysis.

Since the available data covers only 33 observations, simple log-linear regression model was adopted to avoid the econometric problem of multicollinearity, due to the limited degrees of freedom and apparently same trends shown by the explanatory variables which may manifest in high correlation. The advantage of using log-linear regression is its applicability on heterogeneous measurement units and its results of constant elasticity. The estimated regressions were used to test the following study hypotheses: (1) Economic development is positively related to public investment in educational services, and (2) There is significant and positive relationship between population growth and educational investment. The following functional form was estimated on each of the selected variables to test their significance on public investment in education:

$$\log(Y) = \alpha + \beta \log X + u$$

where *Y* denotes the dependent variable (public expenditure/investment on education), *X* is the explanatory variable (determinant), *u* is the random disturbance term, and α and β are constant and estimated coefficients respectively. Further, β indicates the constant elasticity of public expenditure. Table 2 presents the result of the regression analysis.

Table 2: Estimated Regression Equation of Education Expenditure on Key Determining Factors in

Name of Dependent Variables and	Population	Total Budget	GSDP	Total Enrolment	No. of Teachers	No. of School
Total Expenditure on Education						
Constant	-58.41***	-3.27***	-1.38***	-47.99**	-16.72**	-
Coefficients	4.97***	1.08***	0.91***	4.7***	2.76***	3.62***
R-Square	0.978	0.976	0.983	0.954	0.961	0.975
Elasticity	4.97	1.08	0.91	4.7	2.76	3.62
Plan Expenditure on Education						
Constant	-74.57***	-7.21**	-4.96**	-61.6**	-	
Coefficients	6.06***	1.32***	1.11***	5.69***	3.38***	4.42***
R-Square	0.973	0.960	0.967	0.942	0.971	0.975
Elasticity	6.06	1.32	1.11	5.69	3.38	4.42
Non-Plan Expenditure on Education						
Constant	-52.17***	-2.4***	-0.71***	-42.75**	-14.37**	-
Coefficients	4.48***	0.98***	0.82***	4.23***	2.47***	3.26***
R-Square	0.970	0.969	0.980	0.946	0.94	0.963
Elasticity	4.48	0.98	0.82	4.23	2.47	3.26
***significant at 1 percent level, **significant at 5 percent level & *significant at 10 percent level						

Interestingly, the estimated coefficients were found to be highly significant in all cases, even for plan and non-plan expenditures. Thus, we may conclude that public investment on education is significantly dependent on population, budget, growth (as indicated by GDP), enrolment, number of teachers, and number of schools. The result is in line with our research hypotheses. Therefore, GSDP as an indicator of economic development and public investment on education are directly related, while population and educational expenditures are positively related. Further, the demand for education as given by total number of enrolment is also directly related to public expenditure on it.

The magnitudes of the estimated regression parameters may be explained further as follows. First, the constant terms were found to be negative in all cases. This indicates zero (or near zero) public educational expenditures in the absence of these determinants. Second, the estimated slope coefficients are the constant elasticity of public expenditure with respect to the determinants. It is observed that there is relatively high elasticity of education expenditures in case of population size (4.97), enrolment (4.7), number of teachers (2.76), and number of schools (3.62). Thus, there will be a highly more than proportionate increase in public investment due to an increase in these factors. At the same time, though significant, there is relatively lower elasticity in case of GSDP (0.91) and total budget size (1.1). The result suggest less than proportionate increase in public expenditure on education to the pace of economic development (i.e. GSDP), while there is a more or less proportionate increase with the increase in total budget expenditures. In a nutshell, public investment on education in

Mizoram is most sensitive to population size and students' enrolment, while it is least sensitive to economic development (as measured by GSDP).

Table 3 presents the results of estimated log-linear regression of public expenditure per student (total expenditure divided by enrolment) on student enrolments, number of teachers, and number of schools in Mizoram. The estimated coefficients may also be interpreted as the sensitivity (elasticity) of unit expenditure on these factors. The coefficients are significant in all cases, while the constants are insignificant in case of student enrolment for high school and number of teachers for primary school. At the same time, the estimated R-squares are in the acceptable range of 0.59 to 0.76. It can be observed that the estimated coefficient or elasticity is highest for primary education in each of the cases. The coefficients of unit expenditure for primary school are 2.41, 0.87, and 1.3 for student enrolment, number of teachers, and number of schools, respectively. This indicates that there is more than proportional relationship between unit expenditure on primary education and such factors as enrolment, teachers, and schools; while there are less than proportional relationship in the cases of middle and high school. Thus, the unit cost on primary education is most sensitive to these factors. This may, otherwise, be taken as the vulnerability of primary education in the state and at the same time, it also suggests the possibility of significant improvement with increased budgetary expenditures.

Table 3: Estimated Regression Results of Total Unit Expenditure on School Education

Factors	Constant	Coefficient	R-Square
Student Enrolment			
Primary	-8.7***	2.41***	0.59
Middle	-3.14***	0.97***	0.73
High School	-0.17	0.72***	0.57
No. of Teachers			
Primary	-0.05	0.87***	0.73
Middle	2.0**	0.63***	0.7
High School	2.87***	0.57***	0.67
No. of Schools			
Primary	-1.99**	1.3***	0.76
Middle	2.41***	0.75***	0.73
High School	3.82***	0.61***	0.64
***Significant at 1% level, **5% level and *10% level			

Conclusion

Based on our analysis, we may draw the following conclusions: Firstly, there has been commendable growth of public investment on education, both in current prices and constant prices. The observed trend may be considered as the achievement of the state government to provide basic facilities for human resource development among the people. Secondly, the growth of public expenditure on education was found to be positively related to its outcomes as the student-teacher ratio (reverse of teacher-pupil ratio) showed a declining trend by almost -2 percent on average. This indicates the continuously increasing number of teachers available in schools for the students of Mizoram.

Thirdly, the regression analysis illustrates the following factors as the significant determinants of public expenditure on education: population, total state budget, GSDP, enrolment, teachers, and number of schools. It was further observed that public education expenditure is most elastic to population and enrolment, as it increases more than proportionately with respect to them. At the same time, less than proportional increase was experienced in economic development, as indicated by growth of GSDP. Fourthly, the elasticity of unit expenditures (expenditure per pupil) of primary school with respect to enrolment, number of teachers, and number of schools were found to be highest among the other schools (middle and high school). As observed earlier, primary school shows highest student-teacher ratio and also shows the highest enrolment. Thus, there is enough room for improvement in primary education through public investment in Mizoram.

Lastly, the growth of public investment on education is, to some extent, demand driven. This is in consideration of the magnitude of elasticities for students' enrolment and population size. Although this trend is justifiable to some extent, more or less stagnating shares of education on the size of the state total budget as well as GSDP, and almost unitary elasticities on these key factors, necessitates further enquiry. This can be taken to reveal the fact that the state government is unable to give

priority to the development of these key sectors of human capital. Thus, it is necessary to scale up their budgetary importance to ensure faster and sustained development of the state.

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