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The Nexus of Poverty and Physical Environment in Palpa

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ABSTRACT

This article einvestigates the inter-relationship between poverty and environment that exist in Palpa.

Palpa, a historical place, proceeding towards the development of agriculture, education, tourism, culture, health and small scale industries, consisting of 1 municipality and 65 VDCS. About 89 percent labor force out of the total is engaged in agriculture sector. Because of rain fed cultivation, primitive technology etc. marginal productivity of land has been declining. The study also shows decreasing trends of forest resource, water resource and agriculture productivity. The study reveals the existence of soil erosion.

Introduction

Poverty and Environmental problems had been outstanding marrows of 20th century and still challenges for 21st century. The established view of poverty as encompassing not only low income and consumption but also low achievement in education, health, nutrition and other areas of human development. And based on what people say poverty means to them, it expands this definition to include powerlessness, vulnerability and fear also. One of the problems of economic growth in any developing nation is poverty. Poverty, environmental degradation and rapid population growth are three mutually reinforcing forces in developing countries, in many cases seeming to perpetuate one another.

Poverty is the cause and effect of environmental degradation in Nepal. The ecology and environment of Nepal are diverse and sensitive. A rapidly growing population is putting pressure on the natural resource base, particularly water, land and forest resources. The rapidly deteriorating environmental and natural resource base has contributed to poverty, as people find it more and more difficult to meet their basic resource needs in a sustainable manner. The high poverty incidence implies that there will be continued pressure on the

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natural resource base. Like anywhere, this sort of nexus also exists in Palpa district of Lumbini Zone. This article einvestigates the inter-relationship between poverty and environment that exist in Palpa.

The Nexus

Palpa, a historical place proceeding towards the development of agriculture, education, tourism, culture, health and small- scale industries, consists of one municipality and sixty - five VDcs. 77.23 percent labor forces out of the total are engaged in agriculture sector. The marginal productivity of land has not been increased because of rain fed cultivation and primitive technology etc. So, they are compelled to live under poverty. They are unable to fulfill even their basic needs. Consequently, forest resources are used as means in order to fulfill their basic needs. It has caused diminution of forest and emergence of environmental problems.

Table 1 shows that in 1993, the index of poverty was assumed as 100. In 2002, the index of poverty has become 121.96.The table also clarifies that in 1993, the index of 10 forest was assumed as 100 and it has become 83.99 in 2002.

Table 1 also shows adverse relationship between poverty and the coverage of forest. The high R (.993), R square (.986), adjusted R square (.985) and F-test (582.785) depict the greater extent of adverse relationship between poverty and the coverage of forest. According to the analysis of the above numerical facts, Pearson correlation coefficient is equal to -.991 and Correlation is significant at the 0.01 level (2 tailed).

Table 1: Poverty and the Coverage of Forest in Palpa

Year	Poverty level (in percent)	Poverty Index	Forest (in 00 Sq. Km.)	Forest Index
1993	48	100	7.62	100
1994	48.86	101.79	7.49	98.20
1995	49.72	103.58	7.35	96.46
1996	50.58	105.37	7.22	94.75
1997	51.45	107.19	7.08	92.91
1998	52.87	110.14	6.94	91.08
1999	54.29	113.10	6.81	89.37
2000	55.71	116.06	6.67	87.53
2001	57.13	119.02	6.54	85.83
2002	58.54	121.96	6.4	83.99

Source: Field Survey (2003).

As the poverty level increases in the absence of alternative occupation, they tend to encroach the forest tending to decrease watersheds.

Table 2 depicts the trend of poverty and flow of water existing in Palpa. According to which in 1993, the index of poverty was assumed as 100. In 2002, the index of poverty has become 121.96. This table also depicts that in 1993, the index of water resource was assumed as 100 and it has become 68.20 in 2002.

Table 2: Poverty and Water Resource in Palpa

Years	Poverty level	Poverty Index	Water resource (000 Cubic meter)	Water resource Index
1993	48	100	44.75	100
1994	48.86	101.79	43.17	96.47
1995	49.72	103.58	41.59	92.94
1996	50.58	105.37	40.01	89.41
1997	51.45	107.19	38.43	85.88
1998	52.87	110.14	36.85	82.34
1999	54.29	113.10	35.26	78.79
2000	55.71	116.06	33.68	75.26
2001	57.13	119.02	32.1	71.73
2002	58.54	121.96	30.52	68.20

Source: Field Survey (2003).

Table 2 shows that adverse relationship between poverty and the status of water resource has been existent in Palpa. The high R (.993), R square (.986), adjusted R square (.985) and F-test (582.671) depict the greater adverse relationship between poverty and the status of water resource. Here, Pearson correlation coefficient is equal to -.993 Correlations is significant at the 0.01 level (2 tailed).

Land degradation is the single most environmental issue in rural Nepal. Degradation of land is caused by soil erosion, landslide, flood, and sedimentation and farm cultivation practices in the marginal lands. In most of the cases in Nepal, there is a natural trend to encroach the forest by land less people which in turn decreases the reservation of watersheds. Poverty is a growing phenomenon in most areas of Nepal, especially in the hill and mountain regions. Poverty has negative impacts on structure of soil, agricultural productivity and loss in the quality and quantity of forests has, therefore direct adverse effect on the condition of soil. As the number of poor people increases or as the poverty level increases in the absence of alternative occupation, they tend to encroach the forest tending to increase soil erosion and land slides. Hence, it is assumed that as the poverty level leads to soil erosion and land slides. Palpa is no exception in this regard.

Table 3: : Poverty and Soil Erosion in Palpa

Year	Poverty level (in percent)	Poverty level Index	Soil erosion (in ooo MT)	Soil erosion Index
1993	48	100	70.66	100
1994	48.86	101.79	69.1	97.79
1995	49.72	103.58	67.57	95.62
1996	50.58	105.37	66.05	93.47
1997	51.45	107.19	64.52	91.31
1998	52.87	110.14	62.99	89.14
1999	54.29	113.10	61.47	86.99
2000	55.71	116.06	59.94	84.83
2001	57.13	119.02	58.41	82.66
2002	58.54	121.96	56.89	80.51

Field Survey (2003).

Table 3 shows that in 1993, the index of poverty was assumed as 100. In 2002, the index of poverty has become 121.96. Table 3 also depicted that in 1993, the index of soil erosion was assumed as 100 and it has become 80.51 in 2002.

Table 3 also shows that adverse relationship between poverty and the status soil erosion has been existent in Palpa. The high R (.993), R square (.986), adjusted R square (.984) and F-test (567.507) depict the greater adverse relationship between poverty and the status of soil erosion. Here, Pearson correlation coefficient is equal to -.993. Correlation is significant at the 0.01 level (2 tailed).

Pesticides are poisonous substances used for preventing, controlling, destroying, repelling or mitigating pests. Pesticides have used in several sectors such as health, agriculture, forest and manufacturing. Besides, pesticides are also used for controlling household pest in Nepal.

Use of pesticides is also regarded as the determinant of environment. Due to the increasing use of pesticides, in the short run agricultural productivity has been increasing but in the long run it has negative impact on the agricultural productivity and human lives as well. Because of higher population growth, to feed them and to increase the production of agriculture production, there has been increasing use of pesticides. It is supposed that there has been adverse relationship between use of pesticides and environment. It implies increasing use of pesticides leads to negative effect on environment. Table 4 provides information regarding trends of poverty level and uses of pesticides in Palpa

Table 4: Poverty and Use of Pesticides in Palpa

Year	Poverty level (in percent)	Poverty level Index	Use of pesticides (in oo MT)	Use of pesticide Index
1993	48	100	70.66	100
1994	48.86	101.79	69.1	101.25
1995	49.72	103.58	67.57	102.78
1996	50.58	105.37	66.05	104.15
1997	51.45	107.19	64.52	105.52
1998	52.87	110.14	62.99	114.41
1999	54.29	113.10	61.47	123.31
2000	55.71	116.06	59.94	132.20
2001	57.13	119.02	58.41	141.06
2002	58.54	121.96	56.89	149.95

Field Survey (2003).

Table 4 shows that in 1993, the index of poverty was assumed as 100. In 2002, the index of poverty has become 121.96. It also depicts that in 1993, the index of using pesticides was assumed as 100 and it has become 149.95 in 2002.

Table 4 also shows positive relationship between poverty and the uses of pesticides. It is estimated that increasing uses of pesticides lead to decrease in agricultural productivity and in turn degradation of environment. The high R (.893), R square (.797), adjusted R square (.771) and F-test (31.327) depict the greater positive relationship between poverty and the use of pesticides. Here, Pearson correlation coefficient is equal to .893. Correlation is significant at the 0.01 level (2 tailed).

Table 5 shows trends of poverty and environmental degradation that exist in Palpa.

Table 5: Poverty and Environment Inter - Linkages in Palpa

Years	Cumulative percentage change of poverty level	Cumulative percentage of environmental degradation
1993	-	-
1994	1.79	8.7
1995	3.55	17.94
1996	5.27	27.09
1997	6.99	36.62
1998	9.74	53.51
1999	12.42	69.87
2000	15.03	86.1
2001	17.57	101.99
2002	20.04	117.95

Source: Field Survey (2003).

Table 5 shows information regarding poverty and environment inter- linkages existing in Palpa. This table also reveals about the impact of environment on poverty in Palpa. The regression coefficient bxy equals to .168, implies 1 percent environmental degradation leads to increase in poverty level by 0.168 percent. So the elasticity of bxy is less than one. Here, Mean square is equal to 423.375, t = 73.922, Adjusted R square .998 R square .999, Standard error of the estimate .2783. Sum square is equal to 423.375 at 1 df and the value of T test equals to 3.300 at 0.11 significant levels. Thus, Table 5 also clarifies the extent of the impact of environment on poverty.

Table 5 also expounds that inter- linkages between poverty and environment in Palpa is significant. Since, its Pearson's correlation coefficient is equal to 1, so, correlation is significant at the 0.01 level (2 tailed).

Poverty is more prevalent and usually deeper in village areas rather than municipality of the district. Basically the rural poor depend upon natural resources for their subsistence, and their behavior affects a significant portion of those resources. The degradation of natural resources has again adverse effect on income status and even human life of the people.

Conclusion

The inter – relationships between poverty and environment is significant in Palpa. Here, the proportionate change in poverty level leads to higher proportionate change in environmental degradation. Whereas,proportionate change in environmental degradation brings less than proportionate change in poverty level.

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Book Review

Jeffrey M. Wooldridge (2002). ***Econometric Analysis of Cross Section and Panel Data***. Published by The MIT Press, Cambridge, Massachusetts, London, England. Pages XIV + 752. ISBN 0-262-23219-7. Price : NA.

Present day research in economics is heavily dependent on microeconometrics. Thorough knowledge of econometrics and skill of using it in different situation, created by nature of data and objectives of the study, ensures the quality of research work and credibility of researcher. For valid conclusion of the research work, it is fundamental to use right model and appropriate econometric technique to estimate it. The book under review is an excellent resource in this direction. The book has been written primarily for graduate level students. However, it can also be used for special topic course and it also serves as a general reference. The primary objective of the book is to give applied researchers a very firm understanding of why certain methods work and to give students the background for developing new methods.

The author is a professor of economics at Michigan University and a fellow of the Econometric Society. Author's long experience of teaching and research has benefited the book to be an indispensable companion for the econometrics students. The author clearly intends for it to be used by students. Chapters covered in the book and their explanations are so well organized, clear and concise that it saves students' long hour of sorting through literature and penetrating it. He covers all the basics; he does it very well, with a lot of attention to empirical applications. Most of the empirical applications can be replicated using STATA datasets that we can download from his web page (http://mitpress.mit.edu/Wooldridge-EconAnalysis).

The book contains twenty chapters divided into four parts. Part I of the book, introduction and background, reviews some basic tools that are hard to pin down in most of the econometrics books. This chapter has conceaded three chapters. The first chapter, introduction, introduces the need of *ceteris paribus* condition for establishing causal relationship among the variables underconsideration and meaning and importance of asymptotic analysis with some examples. Chapter two, conditional expectations and related concepts in econometrics, explains the role, feature and properties of conditional expectation. Chapter three, basic asymptotic theory, summarizes some definitions and limit theorems that are important for studying large sample theory.

Part II, linear model, begins by applying the tools discussed in part I to analyze the single equation linear model using cross section data. This part of the book bridge the gap between classical analysis of linear models to a more modern treatment. The first three chapters of this part deal with single equation linear model. The fourth chapter- single-equation linear model and OLS estimation discuss about the ordinary least squares (OLS) estimation. Although the OLS estimation is not new for those who have knowledge of intermediate level of ecnometrics, the approach used in this chapter is different. This chapter bridges the gap between traditional approaches to econometrics which treats explanatory variable as fixed and the current approach which is based on random sampling with stochastic

explanatory variables. Fith chapter is about the instrumental variables for the estimation of single-equation linear models that discuss the endogeneous explanatory variable and methods of its estimation. Chapter six discusses the additional single-equation topicsand single equation linear model. Similarly, chpter seven discuss the technic of the estimation of system of equations by OLS and GLS. The chpter eight is about the of system estimation by instrumental variables and chapter nine talks about simultaneous equations model. Chpter ten discusses the basic linear unobserved effects panel data models. Last chpter of the book discusses some more topics in linear unboserved effects models.

Part III is devoted to nonlinear econometric methods. There are three chpaters in this part that provide the basis for asymptotic analysis of most nonlinear models encountered in applications with cross section or panel data. This part begins with M-estimation, a methods that includes maximum likelihood, nonlinear least squares, least absolute deviation, quasi-maximum likelihood and many others, in chpter twelve followe by details about maximum likelihood methods in chapter thirteen and generalized method of moments (GMM) and minimum distance estimation in chapter fourteen.

Part IV discusses some specific nonlinear models applying the general methods developed in previous part. This part is mainly concentrated to discuss about the limited dependent variable. In social science we often encounter dependent variable that is discrete and takes on a finite number of values e.g. choices by individual or household. This part includes six chaptes in which fifth one explains the discrete response model. In this chpater linear probability model and various types of logit and probit model have been discussed. Chapter sixteen is devoted to censored regression model. Although hurdle models and two-tiered models also come under censored regression model, this chapter concentrates mainly on tobit model. Chapter seventeen gives the idea about sample selection, attrition and stratified sampling. Chapter eighteen explains the method of estimating average treatment effects (ATE). Although the literature in this topic is rapidly growing and many new techniques and methodology are being developed, this book has not treated it comprehensively. However, those who are involved in impact study may find this chapter quite useful. The models for data presentation are explained in chapter nineteen while chapter twenty discuss the duraiton analysis.

Finally, this book covers all of the core issues in modern microeconometrics. The author fills an enormous gap in the market between applied manuals (which do not deliver enough theory for an academically serious audience), and theory books (that leave you scratching your head as to how one is supposed to implement their results). This is a very useful book for economic practitioners who could generate enough theoretical knowledge to support their work and at the same it helps those who do not want that the theory obscures the practical issues. The publication of the solution manual and supplementary materials for this book by the author makes it easy to use the book. In conclusion, anyone doing applied work with cross section or panel data can benefit tremendously with the use of this book that can be termed as a new classic of microeconometrics.

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