Overview and Summary

A former head of the UN peace verification mission (MINUGUA) has qualified the prevailing social imbalances and ethnic divisions in Guatemala as being as ghastly as in the final stages of South Africa's apartheid regime. An overwhelming part of the population in Guatemala is thought to have Mayan origin, most living in poverty and at the margins of modern society. In addition to the enormous social distress, the country has the second lowest level of formal education in the Latin American hemisphere. After a civil war lasting three-decades, the per capita growth performance of Central America's largest economy is mediocre. The economy is still predominantly agricultural, with more than 1/2 of the country's labor force engaged in farming and forestry. Guatemala's richness in biodiverse forest resources was consecutively exploited during the course of its history. Currently, habitat destruction in Central America is higher than elsewhere in the world, and the annual deforestation rate in Guatemala is even higher than, for example, the rate for Brazil. Do these issues have something in common?

For the developing world, Auty (2001) argues that recent research reveals growing evidence that there may be a link between these items. Yet the literature does not allow drawing simple mono-causal explanations. The relationships stressed here are indeed puzzling phenomena. How and to what extent economic growth, human capital endowment, and the exploitation of biodiverse forests — or other natural resources — are linked to each other is not well explored. Similarly, Stedmann-Edwards (1998) finds many contradictions in this regard. However, only by understanding the factors that promote income generation, enhance social development, and drive people to make decisions to conserve their environment allows reasonable policy interventions to be proposed. The aim of this study is to fill some of these gaps and reinforce arguments from an empirical point of view. Sad to say, the Guatemalan case offers nearly a textbook example for exploring the chosen questions, in spite of not easily accessible data. Given the small size of the open economy and considering its heavy social contrasts, much appears to be clearer here than in other settings.

It should be made transparent from the beginning that due to the complexity of the issues involved, only selected avenues among these relationships can be documented. A focus of the present study lies on the role of human capital, i.e. formal education. Broadly speaking, there are two queries that can serve as a rough guidance throughout the study. First, the underlying question is whether human capital formation has the potential to promote economic growth and, at the same time, can slow down habitat loss. In documenting the correlation between economic growth, schooling and habitat conservation, the aim here is to point out

1 See Merrem (2001).
Overview and Summary

an interesting policy lever. Clearly, there is a substantial number of additional factors that must be taken into account as well. Second, if schooling proves to be significant, not only does the question arise about which level of education is important, but also of how to increase the access and quality of schooling in the complex setting of a developing country.

More specifically, the study consists of 3 independent parts. These parts follow individual research questions, use particular methodologies and come to distinct results. Although they are loosely connected, they should be read separately from another.

Part One investigates the impact of human capital on economic growth through the application of time series analysis and an extended growth accounting exercise. Apart from the elaboration of a data set and the application of an error-correction methodology, the contribution is twofold. First, very little analysis exists that analyzes the role of human capital on growth over a long time period and for an individual country. This study here presents such an analysis. Second, surprisingly rare in macro analysis, the study focuses on the contribution of different levels of education to growth.

To address the question of the role of education on growth, Part One is organized as follows. The first chapters briefly explore Guatemala’s growth patterns over time and discuss the measurement of human capital to growth. After the construction of the relevant data, the following chapters display the results and test for robustness. The final chapter accounts for the sources of growth. The main findings indicate that both primary and secondary education appear to be a key factor for growth. In fact, human capital accumulation appears to explain more than 50 percent of the country’s past growth trajectory. Interestingly, the macro evidence on the returns to education here is in line with micro studies. Part One also finds that the civil war and a resulting negative investment climate heavily affected the economy, and that complementary factors to human capital policies play a great role.

Part Two reveals that rural underdevelopment and low educational endowment are correlated with Guatemala’s past agricultural growth polices. These policies, in turn, not only have hampered human capital accumulation and constrain long-term growth prospects, they also constitute a major origin for the causal structure of today’s deforestation processes. To summarize a bit, Part Two is a general inquiry into the causes of deforestation and emphasizes the role of education. Given the scant evidence on the correlation between schooling and habitat loss, the detailed documentation and empirical analysis of this kind of relationship is a major innovation of the study. To address these questions, Part Two is divided into three main chapters: a conceptual analysis, a qualitative assessment of deforestation patterns in Guatemala, and an empirical analysis.
The conceptual analysis suggests that, in principle, the effects of schooling on habitat loss can be ambiguous. However, the empirical analysis reveals a more straightforward outcome. The empirics are based on three distinct analyses, compromising regional data, national household data and rather unique survey data from Guatemala’s main agricultural frontier region: the Petén. Given its diversity in terms of endemic species, the analysis of this region allows a clearer look at the relationships between schooling, biodiversity loss, and other factors. The overall findings suggest that deforestation in Guatemala appears to be profitable and generally does not seem to follow subsistence-driven patterns. This questions a great deal of the current conservation policies. By contrast, basic primary schooling and, as a consequence, the higher probability of working in the non-farm sector have a strong potential to reduce habitat loss. However, many other factors are equally important. In particular, the effect of schooling and certain types of non-farm employment may be increased via the investment in complementary measures, such as infrastructure facilities in terms of sanitation and electricity.

Part Three is finally concerned with the question of how a developing country can increase the access to and the quality of rural education. By contracting directly with local communities, and learning from successful experiences in other countries, Guatemala has recently employed a unique model of educational decentralization. This part is divided into three main chapters and builds on the previous analysis whose findings suggest that primary education is of particular concern.

The first chapter shows that after the transition to democratic rule and the formal ending of the civil war, somewhat surprisingly, Guatemala has made progress in expanding rural primary education. Although a lot remains to be done, the country offers an interesting case showing that it is possible to draw on small innovations. The second chapter explains the institutional structure of the program. Based on results from evaluation studies and a rough empirical analysis on school survey data, the final chapter assesses the impact of the community-managed schools. Overall, the program has been remarkably successful in expanding educational opportunities and may have generated positive externalities at the local level. However, the available data also shows that the quality of the program remains a concern and that community-managed schools are not the panacea to improve access and quality of schooling. Other issues, apparently beyond the scope of the school organization form, also play a great role, such as school infrastructure, availability of books and bilingual teacher training.

Before proceeding, a few comments are needed on the scope and limitations of this study. First, it does not address the issue of all the potentially conflicting and complex interactions between economic growth, poverty reduction, and the conservation of biodiverse forest resource. There is clearly a considerable amount
of tradeoffs that should be considered in future research. For example, somewhat simplistically, it may be reasonable to argue that over the long run, poverty declines with rising per capita incomes. If deforestation declines with rising income, it would follow that overall economic growth, particular in the rural areas, would act to reduce forest clearance and perhaps reduce rural resource degradation generally. However, rising per capita income may also generate a higher demand for agricultural products, provide resources for capital intensive projects in rural areas and allow subsidies for agriculture. These issues are not analyzed here.

Second, concentrating on the contribution of human capital to economic outcomes does not imply that other factors are less relevant and that schooling constitutes a remedy for solving all the oppressing problems of the country. In fact, the study explicitly attempts to analyze some of the fundamental determinants of growth and habitat conservation by placing emphasis on complementary issues.

Finally, it should be stressed that Guatemala constitutes a most challenging case for research. Throughout its history, as evidenced by UNDP (2002), there has been an impressive ‘culture’ of ignorance regarding the quality of scientific research as well as the collection of statistical data. In this vein, a considerable amount of the information for this study has been collected from disperse sources. In addition, some of the information comes from interviews, consultant’s reports as well as the participation in workshops, conferences and field visits in various occasions during 2001-2003. Despite of a great deal of direct local assistance, helpful discussions on two earlier working papers, and the opportunity to learn from distinguished people, the author requests the reader to remain aware of potential uncertainties in a case study like this.