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Vishwambhar Prasad Sati

Economic and  
Ecological  
Implications  
of Shifting  
Cultivation in  
Mizoram, India

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Vishwambhar Prasad Sati

# Economic and Ecological Implications of Shifting Cultivation in Mizoram, India

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# Preface

Shifting cultivation has been a century-old practice and the major source of livelihoods in Northeast India in general and in Mizoram in particular. A large proportion of the arable land has been devoted to shifting cultivation. In addition, more than 50% of the marginal farmers are involved in practicing it. Shifting cultivation is practiced in the forest areas along the altitudinal gradients with gentle to steep slopes. It has a cyclic nature, in which, forests are cleared, burned, the land is sown, crops are harvested, the land is kept fallow for a long period, and after a period, it is again kept ready for shifting cultivation. This process is kept continued.

Shifting cultivation, the primitive form of agriculture was practiced in the tropical world, mainly in Africa, South Asia, and Southeast Asia. During the past decades, the area under shifting cultivation has decreased mainly in tropical countries. Mizoram, one of the sister states of Northeast India, has an agricultural economy, dominated by the practices of shifting cultivation. Here, shifting cultivation is practiced in the forest areas. The landscape is fragile, and the slope gradient is high. The entire Mizoram receives heavy rainfall mainly during the four months of the monsoon season. As a result, topsoil erosion is very high. This reduces soil fertility, and therefore, the output from the crops grown under shifting cultivation is comparatively less. On the other hand, the flood plains and the valley fills are suitable for the high production and yield of crops through permanent agriculture, which has very high prospects.

Shifting cultivation is changing. Its area has decreased. Similarly, production and yield of crops grown under shifting cultivation have decreased during the recent past. Several driving forces have been observed that are responsible for changing shifting cultivation. Among them, reducing *Jhum* (fallow) cycle, high variability, and change in climatic conditions—decrease in rainfall and increase in temperature, social transformation—increasing literacy and education, modernization, and low output from shifting cultivation are prominent. *Jhum* cycle has reduced from 20–25 years to 3–5 years, which has led to put more pressure on the arable land. Further, low fertility of soils, land degradation, and low output are the consequences of reducing the *Jhum* cycle. The high climate variability was noticed in northeast India

during the past decades. Further, a change in temperature and rainfall has been noticed. An analysis of climate change in Mizoram shows that temperature has increased by 0.4 °C, and rainfall has decreased by 1% between 1986 and 2012. Social transformation in terms of increasing literacy rate and educational level has been observed. People from rural areas have out-migrated mainly to Aizawl and Lunglei cities. These are the two major cities of Mizoram. All these driving forces have manifested to decrease crop production and yield mainly in shifting cultivation, and thus, it has led to change in shifting cultivation.

Mizoram has very feasible climatic conditions—subtropical humid and temperate, which are quite suitable for growing several crops (high agro-biodiversity). A range of climatic conditions supports diversity in growing crops. Therefore, several crop cultivars/races—agriculture and horticulture—grow in Mizoram. Meanwhile, the yield of crops is very low, and as a result of this, several marginal farmers are facing an acute shortage of food. Thus, food scarcity and malnutrition are common phenomena. It has been noticed that practicing shifting cultivation is the major reason for the low yield of crops. The mode of agriculture is traditional under shifting cultivation. Further, due to heavy rainfall that occurs almost four months of summer and monsoon seasons accentuates the rate of soil erosion. Although permanent cultivation has the potential to increase production and yield of crops, yet area under its cultivation is substantially less.

The main objective of this study was to examine the economic and ecological implications of shifting cultivation in Mizoram. The study was based on the collection of empirical data from the 16 villages of Mizoram. A household-level survey was conducted to collect primary data. Secondary data were collected from the forest and agricultural departments and from the satellite imageries. Maps on different aspects were digitalized using a geographical information system. A set of qualitative and quantitative methods was used to conduct this study. There is a total of eight chapters written on shifting cultivation, permanent cultivation and economic, and ecological implications of shifting cultivation. All chapters are supported by maps, diagrams, and models.

I have been teaching and conducting research and development activities in Mizoram University since 2012. A book and several research papers have been published by me on various themes such as food security, nutritional status, sustainable livelihoods, forests, economic development, and tourism, mainly in respect of Mizoram state. To understand the economic and ecological implications of shifting cultivation, I formulated a research/project proposal and submitted it to the Science and Engineering Research Board (SERB), Department of Science and Technology, New Delhi, for funding under its Extra Mural Research scheme, now it is known as Core Research Project. The proposal was approved by SERB, and then I have conducted a two years study on shifting cultivation and its implications on economy and ecology in Mizoram. This book is an outcome of the research project, funded by SERB. I understand without the financial support of SERB, this study was not possible. It is; therefore, I acknowledge and thank SERB for financial

assistance, which could make this study success. I am grateful for Remlal Rawta, Project Fellow, who collected primary data from the 16 villages of Mizoram. I am also indebted to all of those who have contributed and assisted in composing this book. Finally, I dedicate this book to my beloved parents.

Aizawl, Mizoram, India  
October 2019

Prof. Vishwambhar Prasad Sati, D.Litt.



# About This Book

The rural areas of Mizoram have been practicing shifting cultivation for the centuries. Here, it is the main occupation and the major source of rural livelihoods. Out of the total arable area of 5.45%, about 54% area is under the practice of shifting cultivation. Crops grown under shifting cultivation are rainfed, and the production and the yield of crops are significantly low. Due to the decrease in the fallow cycle from 20–25 years to 3–5 years, crops' production and yield have further decreased during the recent past. It has been noticed that shifting cultivation is economically unviable. In terms of the ecological implications of shifting cultivation, it is critical. Clearing of forests and burning them for the preparation of *Jhumlands* lead to environmental and landscape degradation. Soil erosion is enormous in shifting cultivation areas. Shifting cultivation has also adverse implications on faunal resources. Heavy rainfall during the four months in Mizoram further accentuates the rate of soil erosion, the study revealed. This study examined the economic and ecological implications of shifting cultivation in Mizoram. The major findings of the study showed that the area, production, and yield of crops grown under shifting cultivation have decreased during the last three decades. Meantime, the area, production, and yield of crops grown under permanent agriculture have increased during the same time. The book is divided into eight chapters—Introduction, Geo-environmental Settings, Brief Introduction of the Case Study Villages, Economic Impacts of Shifting Cultivation, Ecological Impacts of Shifting Cultivation, Recent Changes in Farming Systems at the State Level, New Land Use Policy and Sustainable Permanent Agriculture, and Conclusion. The study is supported by maps, diagrams, and photos. Finally, the book is useful for all the stakeholders—policymakers, development agencies, academicians, scholars, students, and farmers.

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## About the Author



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# Abbreviations

ASD	Agricultural statistical diary
DoA	Directorate of Agriculture
FAO	Food and Agricultural Organization
FSI	Forest Survey of India
GBPIHED	Govind Ballabh Pant Institute of Himalayan Environment and Development
GDP	Gross domestic products
GIS	Geographical Information System
GPS	Global Positioning System
HRC	Horticulture Excellent Center
ICIMOD	International Centre for Integrated Mountain Development
IRS	Indian Remote Sensing
ISFS	India State of Forest Survey
MIRSAC	Mizoram Remote Sensing Application Council
NLUP	New Land Use policy
OPP	Oil palm plantation
PRA	Participatory rural appraisal
SALT	Sloping agricultural land technology
SERB	Science and Engineering Research Board
SPSS	Statistical Package for Social Sciences
SSD	State statistical diary
WRC	Wet rice cultivation
WRI	World Resource Institute

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