TECHNICAL CHANGE AND YIELD VARIABILITY IN NEPALESE AGRICULTURE

A Dissertation Presented in Partial Fulfilment
of the Requirements for the Degree of
Master of Economics

by
Subhakar Baidya

University of New England
Armidale, N.S.W.
May, 1985

DECLARATION

I certify that this dissertation has not been presented, in part or in whole, for a degree at any other university.

(Subhakar Baidya)

ABSTRACT

For the last decade or so, Nepalese agriculture has been characterised by a declining trend in crop yields. Yields have been declining at the same time as the modern techniques of production embodied in high yielding crop varieties and chemical fertilizers have been emphasized within the country, and substantial increases in productivity have been achieved with the adoption of these techniques in many countries.

The objectives in the study are to identify factors affecting temporal as well as spatial variation in crop yields and to gain more understanding about the efficacy of seed-fertilizer technology in elevating the situation of the Nepalese agriculture from its continuing state of stagnation.

Systems of equations relating individual crop yields to seasonal rainfall and time trend were estimated. The relationship between aggregate yield and use of chemical fertilizers, high yielding varieties, irrigation and annual rainfall was also estimated. The time variable acts as a surrogate for technical change. Time series data from 1971 to 1980 for different sub-regions were combined for the estimation of parameters. Outputs and cropped areas of five principal crops were considered.

The findings of the study suggest that rainfall alone explains a large part of the fluctuations in crop yields. Inputs reflecting technical change such as high yielding varieties, chemical fertilizers and irrigation do not seem to have contributed to raising aggregate crop yields. It seems that technical change has not been firmly established at the aggregate level. Agriculture in Nepal in general is still at the traditional stage.

ACKNOWLEDGEMENTS

During the preparation of this dissertation, I have benefited from the support of a number of people to whom I am indebted.

In particular, I wish to express my sincere gratitude to my supervisor, Professor Warren F. Musgrave, for his assistance, guidance and encouragements. Special acknowledgement is also due to Professor Jock Anderson for his valuable comments. Consultations with Dr. T. G. MacAulay, Mr. Euan Fleming, Mr. Greg Connolly and Mr. Gyorgy Antony at different stages of this work have always been fruitful. Special thanks are due to Mr. Sushil Pandey for his suggestions and assistance throughout.

Finally, I wish to express my appreciation to the Agricultural Development Council, New York for providing me with a Fellowship to pursue my study at the University of New England.

Any errors or omissions found in this dissertation are my own.

GLOSSARY OF SYMBOLS AND ACRONYMS

AIC	: Agricultural Inputs Corporation, Nepal
APROSC	: Agricultural Projects Services Centre, Nepal
ha	: hectare
km^2	: square kilometre
m	: metre
mm	: millimetre
t	: tonne
^oC	: degree celsius
kg	: kilogram
Rs	: Nepalese Rupees (A$ 1 = Rs 15.00 approx)
Mar.Apr.May	: March-April-May
Jun.Jul.Aug	: June-July-August
Sept.Oct.Nov	: September-October-November
Dec.Jan.Feb	: December-January-February

LIST OF TABLES

LIST OF FIGURES

CONTENTS