"Agriculture", the major livelihood activity of human beings, is the base of economic development of India. To maintain the sustainability of physical, chemical, biological properties of soil and crop productivity, the present research was focus on the agricultural waste recycling, which possibly the adaptive strategies to combat the ill-effects of chemical fertilizers in the agro-ecosystems. Moreover, in some parts of India in general and north east India in particular, the use of any type of fertilizer is a constrain due mainly to its high cost and availability in proper time and place, as a result, the poor productivity of crops was evident from this region. By considering the above constrains the present research entitled 'An ecological study of plant residue quality and compost application on soil nutrient dynamics and crop production in a rice based farming system of Arunachal Pradesh' was conducted in the densely populated Papum Pare District of Arunachal Pradesh to found out suitable way to increase the crop production on a sustainable basis to have balanced agriculture. The sample frequency has been designed for two annual cycles during 2005-2006 and 2006-2007. The data collected have been tabulated, analysed for statistical significance and presented in the form of eight chapters including graphical representation of the important and trendy data sets.

A background information on the study has been given in introduction (Chapter 1), followed by collection of important results of available literature and the research objectives in the chapter 2 (Review of Literature and Research Objectives). The study area description is given in chapter 3. To study the agro-ecosystem characteristics a survey was conducted in the Papum Pare District of Arunachal Pradesh. The cropping system, cropping calendar, species composition, diversity, and physico-chemical properties of soil in different land use system have been presented in chapter 4. Estimations of major agricultural plant and animal wastes have been discussed in chapter 5. In chapter 6, the parameters related to different types of compost preparation are presented. Chapter 7 deals with the effect of application of pure rice straw, vermicompost and chemical fertilizer on soil, growth and development of rice and its productivity. Finally the major findings of the study have been discussed in chapter 8. Summary of the research done and literature cited in the text have been listed at the end.