

I. Introduction

Nepal is at a critical point in her history. The population is increasing at a rapid rate and, in spite of the agrarian nature of the country and the Government's commitment to supporting it, there is increasing concern that agricultural production is declining. Many researchers and, indeed, even the farmers themselves believe that the soils are not as fertile as they once were and that the agricultural soils of the country are being degraded. Pressure on the remaining forests for fodder, firewood, litter, and timber is unrelenting and the present rates of extraction of forest resources often exceed the forest's ability to produce them. Biodiversity is declining and the ecological condition is destabilising (Banskota and Jodha 1992). There is also concern that chemical fertilizer, as used in Nepal, does not appear to be conducive to sustainable management. Farmers, and even researchers, at the major wheat research station at Parwanipur, are reporting serious declines in yield after only 10 years of intensive fertilizer use. A recent workshop on soil fertility in the Middle Mountains of Nepal warned of serious acidity problems looming on the horizon, and there was a general consensus that the management of organic matter in Nepalese soils, by and large, was inadequate and seemingly unsustainable. Within the Ministry of Agriculture there are raging debates on the future role of chemical fertilizers in Nepalese agriculture. To all of this, there is a constant, nagging perception that Nepal is undergoing a process of desertification as a result of rampant deforestation and subsequent erosion. Based on this scenario, nothing short of a miracle will save the country from becoming a mountainous Sahara Desert.

There are, indeed, many problems with Nepalese agriculture, in general, and with the management of soil fertility in particular. However, it is this author's contention that much of the apprehension and confusion that appears in the media is based on a basic misunderstanding of the Nepalese landscape and the farming systems that are now in place.

Soil fertility means different things to different people, but, in the context of this report, it includes all the physical and chemical properties of the soil that influence the productivity of the land resource. The dynamics of geomorphic and

pedogenetic processes influencing soil fertility are investigated, as these help to establish a baseline for measuring the sustainability of the soil resource. Opportunities for the improvement of soil fertility management are considered within the context of present socioeconomic conditions. Only technologies that have been successfully implemented, or have shown considerable promise within the Himalayan region, are recommended. Finally, strategies for developing meaningful soil fertility and sustainability programmes are formulated within the present institutional and political framework.

A major gap exists within the soil science field itself when attempting to understand the complex issues of fertility management in Nepal. The tendency has been to focus on the soil itself and to ignore the dynamics of soil management in mountain farming systems. This omission has led to an unjustified focus on the inorganic components of the soil system based on laboratory analyses and experimental plot-based fertilizer trials. The organic system (surprisingly, considering its present importance) has been largely ignored. This focus on chemical fertilizers has resulted in an unbalanced overview of Nepal's soil fertility situation, particularly for the mountain regions. More importantly, this focus has not been conducive towards providing a clear vision for overcoming the present trends towards increasing soil degradation.

This work has been carried out on a contract agreement basis, RFQ-NEPAL-91-027, between USAID and the consultant awarded in August 1991. The primary task of the assignment was to develop a soil fertility strategy for Nepal which addresses the present trends of declining crop yields and the deteriorating soil fertility status of agricultural soils.

Virtually all agricultural workers agree that poor soil fertility is one of the major constraints facing farmers in Nepal, but there has been no concerted effort to characterise the soils, study indigenous fertility management, and determine why farmers are not managing their lands as well as they might.

The study is divided into four main chapters: the land - a brief treatise on the characteristics of the Himalayan

landscape; the farmer - a discussion on production systems and how the farmer manages the fertility of the soil; the future - which provides a perspective on opportunities to induce positive changes within traditional soil fertility management systems. In the fifth chapter, recommendations

are given that will assist the Government in formulating their agricultural development programmes and suggestions are given concerning how the donor might assist in that process. The final chapter is a brief summary of the areas covered by the paper as a whole.

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