

Evaluation of Feasibility of Ecological Sanitation in Central Nepal

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1. INTRODUCTION

Almost half of the world's population lack access to improved sanitation facilities. Thus, appropriate sanitation technologies are urgently needed. Nepal inhabits a large population without access to any sanitation facility, and continuously strives to ensure 100% sanitation coverage nationwide. Urine diverting pit latrines, introduced as ecological sanitation, can be defined as water conserving and nutrient recycling system for use of human urine and excreta in agriculture. In Nepal, every year 180,000 ton of chemical fertilizers are imported. Ecological sanitation would count a lot to utilize locally available resources, to regenerate soil fertility, to save national currency and to achieve the goal of elimination open defecation in Nepal. The objectives of the research were to test the efficacy of human urine for improving crop performance and to evaluate the feasibility of ecological sanitation in rural area of Central Nepal.

2. MATERIALS AND METHODS

The field investigation was carried out at Palung Village Development Committee (VDC) of Makawanpur District, Nepal from March – August, 2016. Five eco-san toilets in two villages (Angare and Bhot Khoriya) were constructed and questionnaire survey was carried out. Villagers were asked about socio-economic parameters, farming practices, awareness of ecological sanitation and fertilizer value of urine. In prior to a field experiment, soil was sampled for analysis of basic characteristics. In the field experiment, cauliflower was cultivated for a month in the two sites to compare the fertilizer value of urine with chemical fertilizer and no fertilizer with three replications. The harvested plant samples were analyzed to understand the nutrient content in plant with different treatments.

3. RESULTS AND DISCUSSION

Eighty three percent respondents were engaged in agriculture growing mainly vegetables, which may raise the feasibility of ecological sanitation. In the study area, water deficiencies in dry season, high demand of chemical fertilizer, lack of sanitation awareness were found to be solved. The soil at Angare has sandier texture and lower nitrogen content compared to that in Bhot Khoriya. While the field experiment in Angare showed that the aboveground biomass of cauliflower in the urine fertilized plot were similar with that in the chemically fertilized plot and higher than those in the non-fertilized plots, no significant difference among the treatments were found in Bhot Khoriya. The more distinctive response of crop growth to the three treatments in the former might be attributed to the poorer soil productivity, which in turn could be caused by the poorer inherent soil fertility and the poorer past management by the farmer in Angare. Thus, use of urine as fertilizer could help poor farmers with low quality soil. The significantly different content of nitrogen and potassium in the plant samples among three treatments in Bhot Khoriya would require further investigation. When urine is utilized as a fertilizer, the productivity could be increased and the money to buy chemical fertilizer would be utilized in other livelihood activities. Ecological sanitation is feasible in the area with similar socio-economic parameter.