

EXECUTIVE SUMMARY

The Curia Watershed Management Project (CWMP) has been launched in Sarlahi and Mahottari districts, situated in Janakpur Zone. The CWMP focuses watershed management intervention in the Bhabar and Churia Hills or the upstream and downstream areas. The two districts are relatively similar in terms of topography and agriculture practices. Despite the commonalties between the two districts, there are some differences too such as Mahottari district has found the most serious flooding problems in the Bhabar Zone areas while Sarlahi district has the most degraded forest and densely populated (CARE, 2001).

The study area; the Bhabar Zone of Sarlahi and Mahottari districts has fragile ecosystems due to reduced forest production and the rapid decline of forest areas; increased occurrence of flash floods; and increased erosion, sedimentation and destruction of fertile agriculture land in the downstream (Bhabar Zone) areas. Over the past few years, Bhabar Zones of two districts has experienced spiraling population growth, which is taking its toll in the form of expansion of cultivation area on to marginal lands, aggravated deforestation and increased practice of intensive cultivation. Such intensive land use practice has raised a question as to whether such intensive agriculture systems are sustainable under Bhabar Zone condition where high rates of erosion and relatively low availability of input exist. The situations are no longer sustainable now, under the present rate of population growth and limited area for expansion of agriculture. Deforestation further accelerated the marginalization of previous productive lands resulting in declining soil fertility. Increasing cropping intensity, mainly in irrigated land has caused farmers to divert fertilizer and manures to these lands leaving rainfed agriculture suffering more from poor soil fertility maintenance. Heavy seasonal precipitation is another factor responsible for increasing poor soil health.

Taking all of these issues into consideration, a soil fertility evaluation survey was carried out in the Bhabar zone of the Churia Watershed Management Project in December 2002. The main objectives of the study were to determine and identify the existing soil fertility status and the potentialities to improve the soil fertility, to prepare soil inventory and soil fertility maps and to provide future strategies and recommendations for the sustainable soil fertility management and agricultural production in long run.

Crop and their management practices are traditional with almost all local cultivars in the study area. The addition of organic matter in the soil is quite low with imbalance application of inorganic fertilizers. These practices have not been only deteriorating the fertility in the soils but at the same time making conditions more favorable for soil erosion.

The general lands systems of the study area are active alluvial plain and alluvial fan. The major soils of the Churia watershed Management command area are identified as Usthorthents, Psamments, Ustifluvents, Fluvaquents, Ustochrepts, Haploquepts, Dystochrepts and Haplustolls (Carson, et al. 1986). The most of the soils from the both Bhabar Zones area are acidic in nature. Soils of the Mahottari district are more acidic than Sarlahi district. Organic matter and total nitrogen in the soils of both the districts is categorized as low in content. Available phosphorus concentration, however in both the

district is high to very high in soils. The concentration of available potash is in medium level in both the district. Overall the fertility status of the soils of Mahottari district is of medium level as compared to medium to high fertility level of the soils of Sarlahi district. The majority of the soil types in both the district are light soils textured.

The integrated plant nutrients management (IPNM) approach is one of the best options to improve soil fertility for sustainable production in longer run. Application of agriculture lime, green manuring, crop residue management in the study area needs to be promoted to improve the physical properties of the soil and enhance the microbial activities in the soil so as to increase the nutrients availability to the plants in the soil.

The prevailing agro-environmental conditions are conducive to accelerate the soil erosion in both districts. Soil conserving cropping systems, soil conserving crops and soil building crops are essential for maintaining soil fertility and preventing soil erosion. Improvement by including the leguminous crops in the existing cropping patterns is highly preferable which helps in sustaining the soil fertility through biological nitrogen fixation (BNF) process. These crops grown mixed with other crops helps also in minimizing the soil erosion by providing good soil coverage.

Collaborative efforts are very much essential in the proper handling and management of such a multifaceted problem. It is therefore, very much urgent for a joint venture program for soil fertility and conservation management in the study area in order to improve crop production and thereby improving rural livelihood. Success in the achievement of efficient research and in the development of soil fertility and conservation management is possible through the joint venture programs between Churia Watershed Management Program, CARE Nepal and the other concerning line agencies working in the district vizly, District Soil Conservation Programs (DSCO), District Agriculture Development Offices (DADO), Agriculture Development Banks (ADB), District Irrigation Offices (DIO), District Development Committee (DDC), Nepal Agricultural Research Council (NARC), International Non-government Offices (INGOs) and Non-government Offices (NGOs) so on.