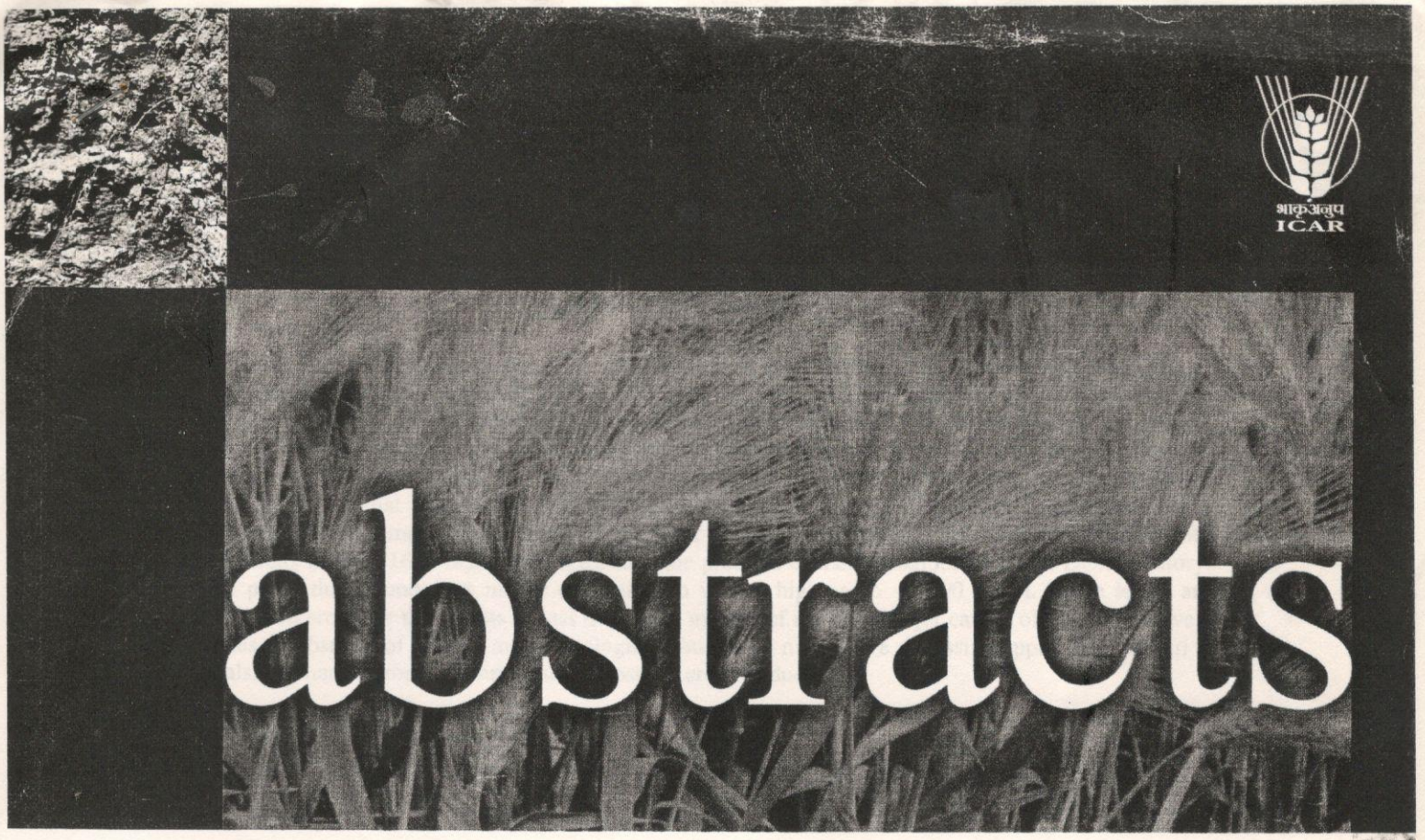

abstracts

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Ground water contamination by nitrates and its effect on human health

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Nitrates are chemicals made up of nitrogen and oxygen. Natural water contains less than 1 mg of nitrate – nitrogen per liter and thus is not a major source of exposure. Fertilizers or organic material in the vicinity of a well are potential contamination sources for the groundwater. The nature and type of soil and the depth of water body plays a key role in permeation of these nitrogen chemicals into the water bodies. Methemoglobinemia (also known as "Blue Baby Syndrome") is a health problem associated with nitrate ingestion. Evidence that other health problems are associated with nitrate ingestion is conflicting. In a study, groundwater samples from different parts of Delhi were found to be severely affected with concentrations of 20 – 1600 mg/lit which escalate the problem of methamoglobinaemia in Delhi territory. In some parts, the groundwater nitrate concentration was as high as 25 – 1800 mg/lit. These levels are perceived dangerous for the infants of less than three months of age. The major causes of these high levels of nitrates in absence of known major geological sources of nitrate, are excessive application of agri – chemicals, discharges from industries and disposal of crop residues.

Impact of land use systems on the potassium dynamics in arid soils of Kachchh, Gujarat

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Kachchh is the Irgest district (45,652 km^2) in the state of Gujarat and the second largest district after Leh in India. The rainfall is scanty, erratic and irregular with with annual average of 315.3mm, distributed in 10 rainy days (average of last 15 years). The cultivated land constitutes only 17.15% of the total district area whereas forest, grass land and cultivable waste land and cultivable waste land constitute about 18% of the total district area. Due to insufficient and erratic rain fall, agroforestry, silvipasture and animal husbandry from the major farming systems in the region.

The dynamics of potassium was studied in two land use systems, namely; grasses and silvipasture systems established in 1988 at CAZRi, RRS, Kukma, Bhuj, Gujarat. Horizonwise soil samples were collected and analyzed for various parameters. The organic carbon content ranged from 0.11 to 0.54 % in soils under silvipasture and from 0.36 to 0.58 in soils under grasses. The forms of K studied included water soluble, exchangeable, available, l/v HNO_3 extractable and morgan's K. The contents of these forms of these forms of potassium varied from 0.006 to 0.053, 0.049 to 0.657, 0.055 to 0.710, 0.31 to 1.08, 0.25 to 0.57, 0.029 to 0.175, 0.016 to 0.302 me/100g respectively. Except the non exchangeable k, all other forms of K were higher in soils under grasses. Under grasses, the available K was higher followed by non exchangeable, morgan's under grasses, the available K was higher followed by nonexchangeable, morgan's and $CaCI_2$ extractable K. The water soluble and exchangeable K under silvipasture system showed a decreasing trend with depth whereas no definite pattern was observed in the 1*N* HNO_3 extractable potassium. Definite trend in distribution of various forms of potassium could not be observed in the soils under grasses except in case of $CaCI_2$ extractable potassium. The metric acid extractable K was 45.5 to 61.1 % more than exchangeable K in soils under grasses whereas the increase was less in the soils under silvipasture systems (15.8 to 21.4%). The exchangeable K showed significant positive correlation with nitric acid extractable K (r2 0.91 and 0.92). The exchangeable K also showed positive correlation with the

organic carbon content in the soil profile (r2 0.78 and 0.71). The different forms of potassium were higher in the surface horizons of soils under silvipasture system, but such trends were not observed in soils under grasses.

Reclamation of Wastelands with Bulk Utilisation of Fly Ash for Sustainable Agriculture

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Coal based thermal power plants in India at present generate Fly ash to the tune of 112 million tonnes annually, out of which about 38 % is being utilized. Fly ash generation is expected to increase to 170 million tonnes/year by 2012. This huge bulk of ash occupies large useful land tracts for storage, which is of concern for environment. Fly ash has a great potential for use in wasteland reclamation and agriculture. Application of Fly ash for the reclamation of wastelands leads to the utilization and conservation of natural resources. Technology demonstrations were carried out by Advanced Materials and Processes Research Institute (AMPRI) *(Formerly Regional Research Laboratory)*, Bhopal on bulk use of Fly ash as soil modifier and supplier of micronutrients to improve the agricultural productivity of wastelands at Rihandnagar, Parichha, Panki (U.P.), Sarni (M.P.), Angul and Damanjodi (Orissa). Fly ash from nearby thermal power plants were analysed for their physical, chemical, mineralogical properties; concentration of trace elements and radioactivity parameters. Based on these properties, the doses of Fly ash application were assessed for various soil-crop combinations, ranging from 100 to 650 tonnes/ha in Randomised Block Design experiments. Both short and long-term effects of Pond ash on crops like paddy, wheat, maize, sunflower, pea, tomato, cabbage, potato, onion etc., were studied. The results showed the increase of crop yields on an average by 12% over control. These significant results are attributed to the favourable modification of soil in terms of increased water holding capacity, nutrients status etc. Trace elements and radioactivity levels in Fly ash applied soils were comparable to those of control. The trace elements in food produces meet the food quality standards. Various technology dissemination activities like *Kisan Melas* and Awareness Campaigns were organised during different stages of the project activities at the demonstration sites. The demonstrations have been successful in popularising the technology and generating confidence among the farmers to the use of Fly ash in agriculture. The technology has been transferred to a number of farmers in different villages in Betul (M.P.), Jhansi and Kanpur (U.P) and Angul (Orissa) districts in India. The farming community has been reaping the benefits of Fly ash application in their fields every season. The present paper evaluates the decade long Technology Demonstration activities executed by AMPRI, Bhopal on bulk use of Fly ash in agriculture.

Evaluation and assessment of Land Use Pattern of Angul region of Orrisa

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Landuse and landcover are an important component for understanding the interactions of the human activities with the environment. As demands are increasing, the sustainability of the land resources has become a vital issue in the present day environment. And the better management of the land resources involve the identification of the land use changes and also to provide better facilities to change the land in beneficial way. The present paper explains in brief the changes in land utilization pattern of angul region from 1993 to 2005 in terms of land required for forest, agriculture, barren, uncultivable, grazing etc. In the study area, the forest area, agriculture area, and other vegetation has increased initially but due to rapid growth in urbanization and industrialization at the place, lts of changes have occurred in land use pattern. Reduction in density of vegetation has affected the climate like rainfall, temperature etc. The reduced