Semi-arid climatic conditions prevail over the region and water scarcity is a common feature. The region is economically very backward (2011 census). The literacy rate in these districts (Satna 63.8% and Chitrakoot 66.5%) are below the national average of 74.0%. The reason behind the poor socio-economic scenario of the district is a lack of technological know-how and industrialization. Another constraint is the indiscriminate use of available natural resources.

The region was blighted by continuous drought between 2003 and 2010, floods in 2011, a late monsoon and deficit rain during 2012 and 2013, and a second spell of drought during 2014 and 2015. The increased drought frequency has changed farming patterns. Now, the irrigated winter crop and not the rain-fed kharif is the main cropping season in the region. Major constraints faced by the farmers are: soil micro- and macronutrient deficiency, low organic carbon, low water-use efficiency and non-adoption of resource conservation techniques, inadequate supply of quality seeds and planting material, need for diversification through cultivation of pulses and oilseeds.

Satna district of Madhya Pradesh and Chitrakoot district of Uttar Pradesh fall in the Central Plateau and Hills agroclimatic zones of India. The region has a peculiar climate and its soil conditions require specific agricultural technologies, making agricultural activities more disadvantageous as compared to other regions.

Agro-climatic zones of India

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1 The Indian cropping season is classified into two main seasons: kharif and rabi, based on the monsoon. The kharif cropping season is from July-October during the south-west monsoon and the rabi cropping season is from October-March (winter). The crops grown between March and June are summer crops. The terms originate from Arabic language where kharif means autumn and rabi means spring.
inadequate extension support, lack of emphasis on development of horticulture including arid horticulture, lack of post-harvest and marketing infrastructure, lack of suitable programme for livestock development with special reference to dairying and need for fishery development both in terms of coverage and marketing.

With the aim of improving livelihood and nutrition security of farmers in the region, Bioversity International in collaboration with Krishi Vigyan Kendras (KVK) at Chitrakoot and Satna, is implementing different activities under the ‘Seeds for Needs’ initiative. Farmers are being exposed to more varieties of different crops to understand their quality traits and strengths under different agroclimatic conditions. Though sharing the border, the two districts present very different agroclimatic conditions.
Satna
District Satna of Madhya Pradesh is situated between latitudes 23° 58’ and 25° 12’ north and longitude 80° 21’ and 81° 23’ east with an average elevation of 317 m.

Forests cover a significant part (0.2 million ha) of the region. Out of the total 0.7 million ha of the district, the total net sown area is 0.3 million ha. Common animals found in the forests are: tiger, panther, sambar deer, chital, wild bear, etc.

The size of landholding is very small. About 71.7% of farmers are either small (1-2 ha) or marginal (less than 1 ha).

The average annual rainfall is about 781 mm. The climate is generally dry except during the south-west monsoon that brings 75% of the total normal rainfall (June-September). The district is largely rain fed with only 27% of the net sown area having access to irrigation against the state average of 40%. Bore wells and open wells are the major source of irrigation. There are no river-based major irrigation projects in the district. The major crops grown are rice, pigeon pea, and soybean in kharif season and wheat, chickpea and lentil in rabi season. Area under horticultural crops is less than 2.3%.

The soils are deficient in organic carbon (0.14 – 0.43%), available nutrients status shows low to medium nitrogen, low to medium phosphorus and medium to high potassium, boron and zinc micronutrients deficient soils.

Chitrakoot
District Chitrakoot of Uttar Pradesh lies between the latitudes 24° 48’ to 25° 12’ north and longitudes 80° 58’ to 81° 34’ east. It is in the 134-252 m elevation range. During 2006, the Ministry of Panchayati Raj identified Chitrakoot as one of the country’s 250 most backward districts.

One of the major constraints faced by farmers are hard rocks underneath and non-trapping of ground water. Total geographical area is 0.3 million ha comprising 55,000 ha of forest area. The net sown area is 0.17 million ha, out of which net irrigated area is 46,000 ha (26.4%). Yamuna and Mandakini, two important rivers of the district, are a major source of irrigation. The average rainfall is 850 mm but during the last 5 years it has gone down to 550 mm.

Major crops grown are rice, sorghum, pearl millet and pigeon pea in kharif season and wheat, gram, lentil and mustard during rabi season. Very limited area is covered with summer crops under irrigation conditions. Depending on the availability of water, farmers differ in their farming systems. Under rain-fed conditions, farmers prefer to integrate cereal cultivation with agroforestry, whereas under irrigated conditions, agroforestry is replaced with vegetables and orchards. Those who have farm lands on the riverside mainly opt for vegetable cultivation. Wheat, paddy, maize, sorghum, chickpea, pigeon pea and green gram are major crops in the district.

Cows and goats play a very important role in the rural economy, although farmers are getting very low output from these animals. Now, resourceful farmers are replacing cows with buffaloes.

Broadening the Genetic Base and Knowledge of Cultivated Crops for Climate Adaptation: A Citizen Science Approach

A Genetic Garden to Safeguard Minor Fruits: A Bioversity International Initiative

Crop Diversity and Farming Practices for Soil Health: A Citizen Science Approach