

Sustainable Development of Rainfed Agriculture

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Abstract: On identifying the rainfed districts in the country with less than 30% dependable irrigation, it was found that as many as 326 of the 631 districts studied were rainfed. Various indicators were studied from the latest data as available between rainfed and irrigated districts under arid, semi-arid and humid climatic regimes. These included biotic pressure, landuse, soil erosion and groundwater exploitation. After presenting the state-of-the-art of these two ecoregions, an attempt was made to present the possibilities for sustainable agriculture in rainfed ecosystems. The Government of India opted for Integrated Watershed Management Program (IWMP) as the growth engine for sustainable development in rainfed areas. The importance of smallholders, women and the role of edaphic factors are presented. Land degradation and the role of soil organic matter in sustaining the health of soils with focus on the importance of flora and fauna in soils are discussed. Finally the effect of IWMP on some of the selected indicators is presented, followed by the emerging issues and the way forward for sustainable agriculture in rainfed areas are highlighted.

Key words: Smallholders, women in agriculture, land husbandry, soil health, soil biota.

India has about 142 Mha area under cultivation, of which crops are grown only with the rains in about 83 Mha (Anonymous, 2012a). A question frequently raised is "What is Rainfed Agriculture (RFA)?" While RFA utilizes rainwater as the source, it does not exclude harvesting the surface and sub-surface runoff, storing and reusing. In other words in areas that are supported with additional water besides the rains, but that which has been harvested and reused also should be a part of RFA. If this is agreed the irrigation provided by surface reservoirs which are not fed from the canals/ rivers, but are evolved as (Rainwater Harvesting Structures (RWHS) only and by wells in non-command areas should become a part of RFA.

The RFA has different agro-climatic zones from arid to humid through semi-arid and dry subhumid regions. By and large as rainfall increases, the ecology in terms of vegetation and soils would be superior exclusive of specific situations as in Koraput, Bolangir and Kalahandi (KBK) districts west Odisha and the hilly districts of Jharkhand and Chhattisgarh, where the tribals of different ethnic groups make a living. Besides *Jhum* cultivation, these areas stand denuded of vegetal cover due to intensive and greedy contractors and that too more frequently with the connivance of the related Government establishments. And with the high,

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more frequently intense, rains the denuded soils loose their fertile surface soil and stand degraded. Consequently they hold less water for the traditional crops like rice to survive, resulting in poor returns. Thus even high rainfall tribal districts are now an ecologically disadvantaged zone besides being economically poor. Such lands require all our attention. Keeping in view these issues, an exercise was taken up to identify the rainfed districts in our country. Prior to this exercise, the guidelines provided by Hanumantha Rao Committee (1994) need consideration. The committee kept 30% dependable/assured irrigation as the cut-off between rainfed and irrigated districts.

The district-wise data were collected on the area irrigated by canals (major and medium irrigation) tanks and wells (minor irrigation). The areas under canals and wells in command areas were taken as dependable/assured irrigated. The areas under tanks and other wells in non-command areas were adjusted in relation to agroclimatic situations to arrive at dependable/assured irrigated areas as given below:

Moisture index	Dependable/Assured irrigated area
- 66 to -50	Canal and Command Area wells + 25% of tanks and wells
-49.9 to 0.0	Canal and Command Area wells + 50% of tanks and wells
0.0 to 99.9	Canal and Command Area wells + 75% of tanks and wells
< 100	Canal and Command Area wells + 100% of tanks and wells