SHREE DEV BHOOMI INSTITUTE OF EDUCATION SCIENCE AND TECHNOLOGY

DEPARTMENT OF AGRICULTURE

CLASS- B.Sc. Agriculture (2nd Year 4th Sem)

SUBJECT- RAINFED AGRICULTURE

LECTURER- MEENAKSHI RAWAT

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TOPIC- History of rainfed agriculture, characteristics and Issues

Rainfed agriculture is a type of farming that relies on rainfall for water. It provides much of the food consumed by poor communities in developing countries. For example, rainfed agriculture accounts for more than 95% of farmed land in sub-Saharan Africa, 90% in Latin America, 75% in the Near East and North Africa, 65% in East Asia, and 60% in South Asia.

Hunger and water correlation

There is a correlation between poverty, hunger, and water stress. The UN Millennium Development Project has identified the 'hot spot' countries in the world suffering from the largest prevalence of malnutrition. These countries coincide closely with those located in the semi-arid and dry sub-humid hydroclimates in the world, i.e. savanna and steppe ecosystems, where rainfed agriculture is the dominating source of food and where water constitutes a key limiting factor to crop growth. Of the 850 million undernourished people in the world, essentially all live in poor, developing countries, which predominantly are located in tropical regions.

Characteristics and issues with Rainfed Agriculture

- Rainfed areas in India are highly diverse, ranging from resource rich areas to resource-constrained areas. Some of the resource rich areas are highly productive and have experienced widespread adoption of technology. However, most of the areas are resource constrained and dry areas.
- In the resource constrained and dry areas, the farming is a survival mechanism rather than a growth oriented activity.

- Rainfed agriculture is practiced under a wide variety of soil type, agro-climatic and rainfall conditions ranging from 400 mm to 1600 mm per annum.

- Rainfed Crops are prone to breaks in the monsoon during the crop growth due to water stress. This water stress may be due to variability of rainfall, delay in sowing, diversity in crop management practice and variability of the soil type. The prolonged breaks can result in partial o r complete failure of the crops.

Issues Related to Rainfed Farming

- **Farmer suicides in Rainfed areas**

In past, the Rainfed farming system was mainly dependent upon the locally available inputs (seeds, manures, animal draft) and used to grow a number of crops, which were able to withstand drought-like situation. However, in recent times, the cropping systems have changed and currently the farmers in these rainfed areas have limited options. Many of the farmers in these regions started cultivating high value crops which requires intensive use of costly inputs (chemical fertilizers/ pesticides, hybrid seeds, life saving irrigation, farm energy etc.) and find it difficult to manage the resources on their own. This is the major reason of growing farm suicides in rainfed areas.

- **Green Revolution – Rainfed Areas – Groundwater Problem**

Green Revolution bypassed the less-favored rainfed areas which were not the partners in this process of agricultural transformation. Green Revolution was designed around growing high-yielding varieties of wheat and rice, which needed plenty of water and chemical inputs. The entire agricultural research framework, incentive structure, price support, input subsidies, extension system were designed to 'flow' along with irrigation.

- **Green Revolution – Rainfed areas – Change in the Cropping patterns**

To reduce their vulnerability to rains, farmers in some areas grew crops such as jowar, bajra and pulses. These crops are low-yielding, but less affected by variations in rainfall. This saved the farmers from the risky nature of farming

in rainfed and dry areas. In the same field, they planted multiple crops. For instance, Jowar or pulses, both drought-resistant, would be planted alongside wheat, which gave high yields in normal rains. They also maintained livestock or, if forests were in the vicinity, gathered minor forest produce.However, with the advent of green revolution and advent of electricity and groundwater tube wells, the cropping patterns also changed.

For example, the farmers of Malwa (MP) used to grow jowar during the rains and Malwi Ghehu , a local wheat variety, after that till the advent of Green revolution. However, once the pumps came in, farming became a year long activity. Cash crops like soya displaced jowar. HYVs of wheat displaced Malwi Ghehu. This is the story of almost all parts of India, and that is the reason that cotton, maize and soya remain the major crops of the rainfed are ofIndia.

- **Groundwater level**

The too much exploitation of the groundwater by tube wells led to the depletion of this finite resource. For example, in some parts of Madhya Pradesh, the groundwater levels have plunged from 50 ft in the 1970s to 700 ft now. Today, it has taken a shape of acute crisis in six states of India.

Note: If the ratio of groundwater extraction to groundwater recharge is less than 70%, it is considered safe; 70-90 %, semi critical; 90-100 %, critical; and more than 100%, overexploited.

Between 1995 and 2004, the proportion of districts in semi-critical, critical and over-exploited has grown from 5% of the agricultural area and 7% of the population to 33% and 35% respectively.

The six states where the level of groundwater is unsustainable are Punjab, Rajasthan, Haryana, Tamil Nadu, Gujarat and Uttar Pradesh. Ironically, these six states accounted for half the food-grain production in 2008-09.