ANTHROPOGENIC INFLUENCES ON THE VEGETATION OF WESTERN RAJASTHAN

by

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INTRODUCTION

Western Rajasthan, forming a part of the Thar desert, is very sensitive to factors of degradation such as climatic crisis or misuse of land. There have been marked changes in the physiography of Rajasthan (Piggot, 1950; Smith, 1949; Wadia, 1954; Rode, 1964; etc.) during geological times. There are geological considerations which seem to have contributed materially, since the close of the last glacial period in northern India, to the deterioration of the desertic conditions (La Touche, 1902; Wadia, 1950, 1959; De Terra, 1939). Raverty (1892) is of the view that the desert originated in mediaeval times but the archaeological evidence (Ghosh, 1952; Sankhala, 1952; Vats, 1952) indicated that it is at least two millenia old and its nucleus must be older still. The history of the river systems (Oldham, 1874, 1886, 1893) shows considerable evidence to indicate that not long ago numerous streams flowed through Western Rajasthan and the climate was less severe than at present. The tract was wooded and there were large settlements along the rivers Saraswati and Drishadvati which have remains of Harappa and Mahenjodaro. Further studies (Marshall, 1931; Luthra, 1936; Kohli, 1944) showed that there was a highly evolved culture in Rajasthan around 3000–4000 years ago which was characterized by pottery, bricks and copper smelting. It is obvious that these highly cultured people practised agriculture and had domesticated animals. How much of the forest wealth was destroyed by these to burn pottery and to smelt copper could be anybody's guess. With the growth of population and arrival of some foreign tribes like Huns, Gujars etc. from Central Asia and their nomadic ways of life, destruction of the forests continued indiscriminately on a much larger scale even after the drying of the river system and gradual reduction in precipitation. This resulted in the imbalance between the moisture level and the heat which enters the soil and goes to heat the air. Instead of heating the moisture in the soil and evaporating it the radiant energy heated the soil mass in the air and the air layer close to the ground. The loss of plant cover further aggravated the situation and as the amount of radiation at the surface of the earth could not be used in any large amount for evapora-
tion of moisture and transpiration, it heated the air and the soil further, thus creating arid conditions.

These features should not be confused with the present disturbance of land surface which has been superimposed over this landscape and is sufficiently ominous in its importance to further the productivity of these lands. It is illustrated by the severe dust storms which are prevalent in summer, in the accumulation of sand hummocks and sand dunes on cultivated lands and around villages, by large areas of annual vegetation where perennial vegetation should exist, and by the newly active scars of the old fixed sand dunes. These disturbances are the result of excessive cultivation or grazing and are especially prominent in the vicinity of the villages. Many factors have collectively influenced this long developing process of degradation of resources and the recent serious acceleration of these is the aspect of more immediate concern. Though there may be two opinions about the origin of the deserts, there cannot be different opinions about the role of these factors in the maintenance of the present desertic conditions, like in many parts of the tropical world (Sauer, 1958).

The anthropogenic influences may broadly be classified as I. Direct influences and 2. Indirect influences. Under the direct influences are included (a) Human population and their socio-economic conditions, including nomadism (b) Land utilization and agriculture and (c) Destruction of vegetation for fuel, fibre, wood and fodder. Indirect influences include (a) Domestication of animals (b) Overgrazing of natural pastures (c) Dissemination of seeds of undesirable species (d) Degradation of the micro-climate following the disappearance of the vegetation (e) Introduction of exotic species at the expense of indigenous species for plantation etc. and (f) The action of chemical products such as pesticides, herbicides etc. These have been reviewed in this article.

**DIRECT INFLUENCES**

**Human population and their socio-economic conditions**

The relation between the distribution of population and the availability of water in arid regions is obvious, but variations do occur on account of difference of topography, soils, landuse, occurrence of economic minerals, accessibility and other socio-economic factors. The density of population in Western Rajasthan is high by the general arid zone standards and is characterised by the practice of nomadism (Bose et al. 1964). In Jhunjhunu, Sikar, Pali, Jalore and Nagaur districts the density is respectively 315, 271, 168, 136 and 111 per sq mile which decreases fairly rapidly towards the west to 103 in Churu, 101 in Jodhpur, 64 in Barmer, 42 in Bikaner and 9 in