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CONCLUSION

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Irrigation happens to be the key input for the development of agriculture. The study deals with the spatio-temporal distribution of irrigation and its relationship with other attributes in Upper Vedganga basin in southern part of Kolhapur district of South Maharashtra. Kolhapur district is one of the agriculturally developed parts of the state. This is also known for its sustained development of irrigation where natural flow of rivers has been tapped by constructing small dams across the river courses. The spatial variations in irrigation development are, however, observed in the region.

The foregoing analysis indicates that the Upper Vedganga basin presents varied physical characteristics which have controlled the intensity and magnitude of irrigation. Moreover, the narrow fertile flood plain offers favourable environmental conditions for irrigation developments. The rest of the region, however, suffers from agro-morphological, agro-pedological problems setting the barrier to irrigation developments. The slope has significant bearing on irrigation development (Chapter I). Obviously, the high intensity of irrigation (above 16%) is confined to the areas having the slope below 6° (Fig.1.3 and 2.4-A). Away from the river course on both sides, the extension of lift irrigation is hampered with increasing intensity of slope. The areas with the slope above 11° or upto 18° have attained poor development of irrigation (i.e. less than 8%). The springs are the major source of irrigation wherever terracing is practised in such hilly parts.

The rainfall distribution in the region is highly uneven which is concentrated (95%) in the months of June to September received mainly from south-west monsoon. The post monsoon period with its acute scarcity conditions invites the need of irrigated water to sustain crops.

The river Vedganga masters the drainage of the basin. The network of drainage (average frequency 3.85) is almost uniform in the region determining the water regime. The profitability of irrigation is also linked with soil characteristics. The fertile soils along the river course, particularly in the east, have shown high intensity of irrigation. However, the poor laterite patches along the river course, in the west, have discouraged irrigation developments. The infertile soils of the north and the south have led to poor productivity of irrigated crops.

The preceding analysis reveals the fact that the region possesses rich water resources. However, they are inadequately used inviting optimum utilization. Notwithstanding, about 22 percent of the ground water potential has been used till today, whereas 15.7 percent of surface water has been tapped for the irrigation use. Obviously, this offers greater opportunities for the utilization of irrigation potential. The field work has revealed the fact that the traditional methods of irrigation in the region have led to wastage of water. The awareness among the farmers for the proper management and rational utilization of water resources is the urgent need of the region.

The general landuse pattern is dominated by forest cover (38.81%). Besides this, about 62 percent of the land area is not used for cultivation. The eastern and central parts of the region constitute major cultivated area. The food crops constitute the major portion of cultivated area among which rice is major kharif crop due to favourable agro-climatic conditions. Among the irrigated crops sugarcane shares 66 percent of the net area irrigated (Chapter I).

The region has different sources of irrigation (Chapter II). The lift irrigation is mainly confined to the central flood plain and well irrigation to the eastern parts. The other sources are dominant in the north and the south (Fig.2.1-A,B,C). Of the total irrigated area, lift irrigation accounts for 68.64 percent followed by well irrigation (18.78%) and other sources (12.58%). K.T.Weirs and rural electrification have played an important role in promoting the development of lift irrigation. Besides this, in view of topographical conditions, lift irrigation seems to be suitable source of irrigation.

There is much regional imbalance in the development of irrigation facilities. The intensity of irrigation is 10.50% which is slightly more than state's average (10.31%) and less than Kolhapur district (12.7%). The two patches in the flood plain have registered relatively high intensity of irrigation whereas it is moderate in the east and low intensity is confined to the hilly tracts in the north, south and the west (Fig.2.4-A).

The study regarding the developments and requirements of irrigation reveals that the present development of irrigation is not according to the need of the area. The greater priority of irrigation should be given to those areas where it needs most (Fig.2.5-B). Such studies at micro-level are of immense significance in the planning process so as to avoid the greater imbalances in the development of agriculture.

The investigation clearly indicates the villagewise, cropwise and sourcewise regional variations in the economics of irrigation. The regional disparity in the economics of well irrigation may be related to the availability of water, the device of lifting the water, fertility status of soil etc. In case of lift irrigation the use of chemical fertilizers and energy charges differs markedly in space resulting the differences in benefits. Although the region records cent percent rural electrification, the distribution of electricity to pumps is the most urgent need of the region. The study of Mathagaon exhibits high power charges caused by the use of oil engines which affect negatively to the profit. The oil engines, therefore, may be replaced by electric motors. The cropwise cost benefit analysis indicates that sugarcane is economically beneficial crop as compared to wheat.

The irrigation has positive impacts on the agricultural productivity of irrigated crops, consumption of fertilizers, levels of mechanization and cropping pattern in the region

(Chapter III). The high productivity of crops is largely affected by good irrigation facilities. Away from the river course the productivity reduces correspondingly with the decrease in the intensity of irrigation. The zones of productivity are coincided with the zones of fertilizer consumption as the use of chemical fertilizers is directly related to the availability of irrigated water (Table - 3.2 Correlation Matrix).

Mechanization of agriculture has become essential characteristic of irrigated areas. Although traditional implements are in the use, the modern and improved implements are increasingly used in the region.

The correlation matrix (Chapter III) reveals that the relationship among irrigation, agricultural productivity, fertilizer and mechanization is positive.

The irrigated cropping pattern has been changed as new irrigated areas have emerged out in the region. The K.T. Weirs constructed in the lower parts are old and therefore, since for many years, the sugarcane cultivation has been practised. However, as the construction of weirs took place in the upper part of the river, the lower parts are facing the scarcity of water (field observations). This situation has resulted into the change in cropping pattern causing the reduction in sugarcane area and increase in irrigated area of rabi food crops. Such exceptional problem could be solved after the completion of Patagon Irrigation Project, under construction

for the substantial water supply.

The sloppy lands at the foot-hills could be converted into terraces and the irrigation could be extended to these terraces by setting lift irrigation schemes of heavy capacity. This, however, would require heavy capital outlay which could be met only by co-operatives and government agencies.

As the region having fair network of drainage, the small earthen dams at a regular interval, on the streams, nalas could be constructed on co-operative basis or with the assistance of Zilla Parishad, the water of which would be useful for the rabi crops.

Although the study area records slight increase in irrigated area (from 9.1 to 10.57%), there remains still large scope for bringing additional area under irrigation. In spite of the rich underground and surface water resources, the region is lagging behind in irrigation development. It needs to inform the farmers about the facilities provided by the government or co-operative agencies regarding bore-wells, blasting, loans and subsidies for wells etc. The GSDA can play an important role in providing information regarding the watertable in the region to enable farmers for locating the sites of wells. This will facilitate to utilize ground water resources. A well defined strategy may be planned for the rational use of water resources in the region. Water losses through evaporation seepage can be reduced through proper water management and scientific methods

like drip and sprinkler irrigation. The entire region is looking anxiously towards the completion of Patgaon Medium Irrigation Project which, in author's opinion, could bring about the prosperity to the region.