



WASTELAND MANAGEMENT THROUGH WATERSHED

APPROACH

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Abstract: The present research paper deals with vital issues in adopting an integrated approach for wasteland management through watershed approach for sustainable development in Alwar district. It deals with specificities of Aravalli ranges and processes of farmer empowerment. Therefore, a comprehensive strategy of wasteland management must be based on a holistic and interdisciplinary understanding of both society and habitat within scientific framework. Various measures are to take to control further deterioration and degradation of wasteland.

Keywords: wasteland management, Integrated Rural Development, government, government agencies, Aravalli ranges

Introduction: During the last three decades various programmes have been tried to developed wastelands. The land reforms and the Integrated Rural Development Programme were not generally targeted to improve wastelands or marginal lands in the district, therefore, did not show improvement in these lands. On the other hand due to soil erosion and water runoff pace of land degradation has become acute. This research paper traces the background of the present approach to wasteland management, and suggest watershed technique to improve the sustainability of the area.

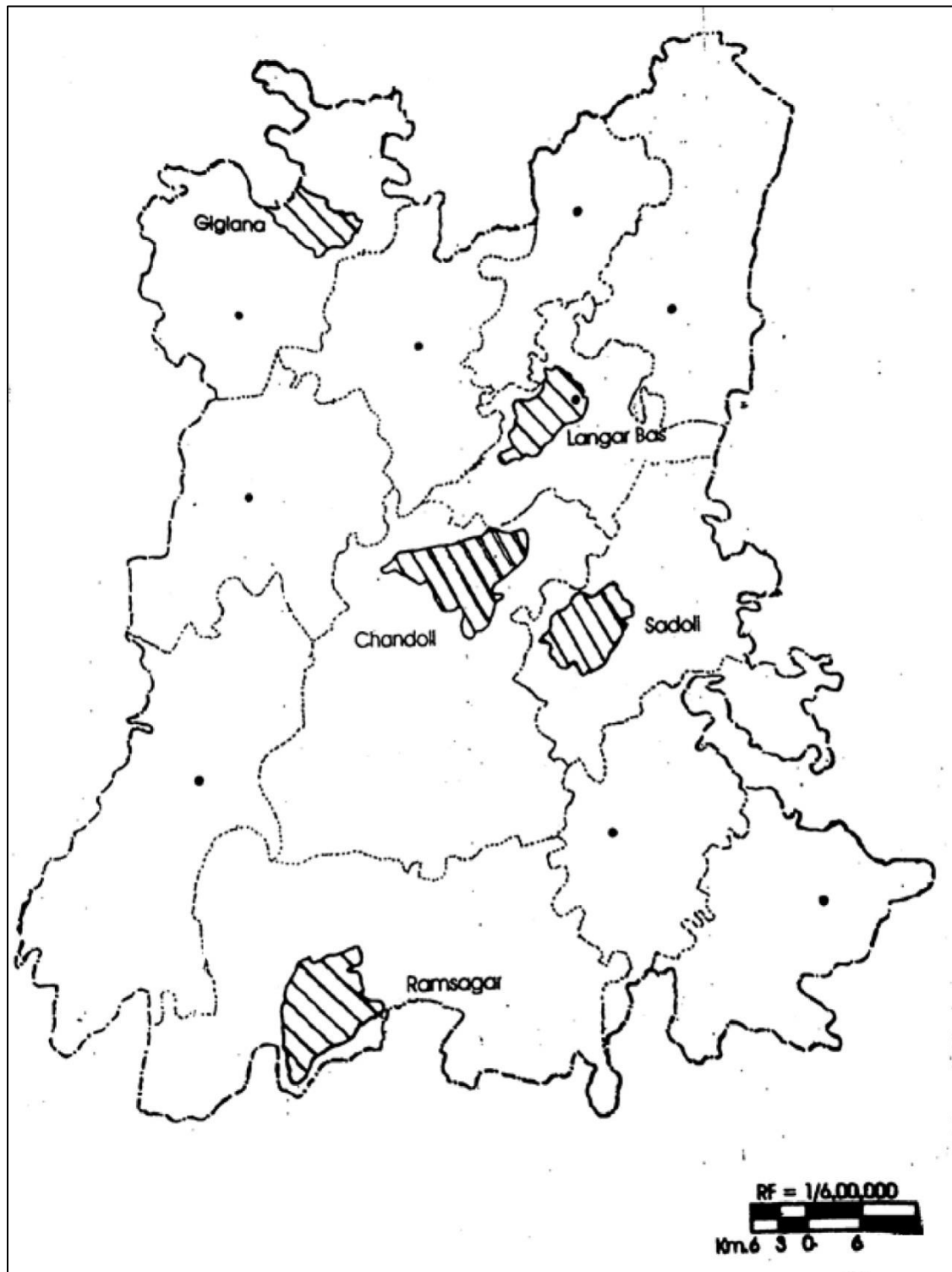
The preceding analysis of wasteland classification, however, does not say anything about the extent of land degradation or loss in productivity, over time due to various natural and man-made causes. Village lands have generally been a victim of the “tragedy of the commons” phenomena where they are exploited by all; such a “laissez faire” policy was followed by the government with respect to these waste lands. Neither were any funds allocated for them nor was any specific government department made responsible for grasses and pasture development. Therefore, social forestry was introduced in 1980’s to fulfill people’s needs as well as to save these lands for further degradation. In 1985, the National Wastelands Development Board was setup to promote people’s participation in afforestation programmes and to regenerate the health of India’s wastelands. In 1992, a Department of Wastelands Development Board was created which also insisted that the



government agencies involved with plantations should have complete control over lands where trees were planted. These programmes were actually concentrated on the production of fuel wood, whereas the loss of soil from such lands was linked more to lack of control of run-off of rainwater. Without controlling runoff it was not possible to stabilize water regions even for crop lands, and it was difficult to rehabilitate degraded lands without introducing moisture conservation and water harvesting measures.

The main thrust of the programmes should have been on activities relating to soil conservation, land shaping and development, pasture development, and water resources conservation for the entire watershed, not merely afforestation on wastelands. The watershed development programme cannot succeed without the full participation of project beneficiaries and careful attention to issues of social organization. In 1995, Hanumantha Rao committee suggested new guidelines on watershed development of on entire compact micro-watershed rather than pieces of wastelands scattered at different places.

This research paper is aimed to study impact of watershed management for the development of wastelands in the district. Watershed consists of all sloping and rainfed lands in the district which Aravalli hills are the most fragile and difficult to manage, therefore; watershed approach has become one of the most significant challenges to people of the district also. To understand, the present environment and organize environment friendly programme for sustainable development has become both complex and herculean tasks because the district have almost 17.40% wasteland in the different categories, which falls in second highest of land category.



Aravalli Region : Alwar District Location of Selected Watershed

Johad construction can be seen as one of the best possible options in any agro-climatic situation, for conserving maximum rain water and recharging ground water “National Water Policy” (1987)



gives priority to drinking water for both human and livestock over to its other uses. The policy insists on control and regulatory mechanism on ground water exploitation and also suggest integrated efforts at conjunctive water use, while analyzing the macro irrigation schemes in India, such guidelines hardly reflect an understanding of operational perspective. Water being extracted from a public domain, water rights and regulatory mechanisms for equitable distribution, should be the key thrust in implementing any watershed development programme. Unlike mega-watershed programme, some of the micro watershed initiatives i.e. johad system certainly reflect incorporation of “water rights” and “equity”.

Recently, Govt. of India and “Supreme Court of India” issued notices to all the medium and major industries to relocate their production unit from the union territory state of Delhi, purely for pollution control and the environmental protection point of view. Alwar district being closes to Delhi seems as the best possible option for most of the industries relocating their production units. These industrial units are either operational or under construction on the New Delhi-Alwar highway. More industries are in pipeline and looking for agricultural land to buy for further degradation.

Impact of Johad for Sustainable Development : The cover area of Johads varies from 2 ha. to a maximum of 100 ha. in Alwar district. Prior to the mid-70’s, there was a symbiotic relationship between people and existing natural resource base. But for sake of so-called development, the sustainable means of livelihood have been systematically destroyed. Unjudicious industrial development and excessive mining and the large scale deforestation resulted the severe land degradation. The impact of these 2500 johads in about 500 villages is being taken in the district as on following aspects :

Socio-Economics Issues : In the study areas still the village have primary occupation as agriculture followed by livestock rearing. Villages located inside the reserve forest area also earn their livelihood from minor forest procures. Johad has made visible impact on socio-economic scenario of the region. Within a year of the construction of Johadwells of the village were recharged and water supply could be ensured for the entire year. The economy of villagers has been improved with the increased water and fodder availability of their livestock. Besides this it has increased food production, helped in conserving soil, increased the level of water in wells, increased bio-mass productivity and even converted low seasonal rivers into perennial rivers Aravari and Ruparel. These out-comes are due to a series of Johods constructed in the region.



On Groundwater : Increase in groundwater table in this region is a cumulative effect on wastelands johad construction plays a major role in recharging groundwater. In all six villages significant increase not only in water level of the wells have been observed but reviving some of the dry well also is reflected. The study reveals that out of 970 wells, in 120 villages, only 170 wells were operational and rest did not have any water but after construction of various johads in the region, all 970 wells were in use as perennial supplier of water. The increase of water level depend on the distance of the well from the Johad, the soil type and its moisture retention capacity and the porosity of the rock types in the region. The recharge in the wells also depends upon the quantity of water impounded in the Johad. According to evaluation report available, ground water level has risen by 20 to 50 feet.

Impact on Agricultural Production : The recent initiative of constructing Johads has increased agricultural productivity. In these villages agricultural wasteland was most common, which were either left barren or cultivated for only one rabi crops. According to recent study about impact of Johad on wheat production reveals that there has been 100% increase in its yield. This effort has brought about significant increase in food production in the area. The areas, declared as “dark-zone” has been now marked as “water surplus” zones. In the district wastelands were hardly cultivated before construction of johads but these land has been brought under cultivation with higher cropping intensity. However, the cropping pattern has remained unchanged. Even with surplus water, there is no significant influx of cash crops in the region. Still, the farmers are intensifying the staple crop production such as wheat and pulses.

Measures for Watershed Area Development

- **Arable Land Treatment :** The village has 2722 hect. arable land which is 67% of the total geographical area but productivity of out-put of these land is not much significant therefore various programme is being carried out in the village. The contour bunding with munja hedging is being raised at sloppy areas. The control on gully erosion is going and other measures to hold excessive run off within arable land. The different sights have been chosen for crop demonstration to enhance villagers motive. There are agroforestry and arid horticulture is also being promoted. The innovative organic farming system has been introduced in the area.



- **Non-Arable Land Treatment :** The village has 1020 hect. non-arable land which is 27% of the total geographical area of the village. The various techniques are projected to develop these wasteland of the village as vegetative cover has been raised, ditchcum band fencing also been constructed and various inclothds have been adopted to control gully erosion for further deterioration of the soil. The work on dissecting of Nadies is yet to start in some of areas. The numerous shrubs and trees are planted in the area.
- **Drainage Line Treatment :** This is a third important activities for watershed development of the area. The activities include is bank stabilization, loose stone chock dam construction, construction of low-cost earthern check dam, dugging out low cost ponds and raising of shuhken structure. Although anicut and pucca are the part of watershed development but it has been not included in this project.
- **Live-stock Management :** Another important measure to develop the area is to manage the livestock in better perspective. These include in the projects are castration of scrubs bulls, natural breeding, animal treatment camp, raising of dry fodder, and its demonstration etc.
- **Sahadoli Watershed Programme :** The sahdoli watershed is located in Ramgarh Panchayat Samiti of Alwar district. The watershed is located as 27o37' to 27o32' latitude and 76o42' to 76o47' longitude. The distance of the watershed from Panchayat Samiti is 20 km and 20 km from the headquarters. The watershed area is mostly undulating, involving variable slopes. The area is well drained through small gullies and nallah. There is very severe problem of soil erosion. There is no forest in the watershed area. The common lands are is most degraded form.

In this watershed area, the main crops grown in kharif are bajra, til gwar and arhar. Their crops are cultivated either as single crop or in mix cropping. In Rabi season, main crops grown are mustard, wheat, gram and barley. The horticulture plants in these areas less in trend and farmers are mostly growing ber, lemon, papaya, mango, anar and desi-babool.

Reclamation of Wastelands for Sustainable Development : The wasteland in the district should be rehabilitated with due regard to long-term sustainability of the Aravallis. Severe to very severely eroded areas can be taken care of by adopting certain measures, viz. field bunding and leveling, contour cultivation, storage of excess rain water during monsoon period, dry farming and proper



crop rotation also on the other land, gullies wasteland can be stabilized both by vegetative as well as mechanical measures. Fast growing forage species like pennisetum pedicallatum, grasses, like cynodon dactylon and cenchrusciliares, lengumes like siratro, style, clitoria and tree species like Albizzia lebbeck, Acacia nilotica leucacea leucocephala are recommended under pastoral and silvi pastoral system (Journal of the Indian Society of Remote sensing, vol. 26 No. 4, Dec. 1998 pg. 167) mining activity is confined to very small pockets. However, these drastically disturbed lands need to be reclaimed by the present generation for use by the further generation. For the effective conservation of these sites, a proper survey should have been done priority disturbance of the area defining its hydrological, biological and soil characteristics. At present, the best and most reliable reclamation treatment, according to power and schuman (1994), is to save and respreads the original soil material after shaping and smoothing spoils to a suitable contour so that a proper cover with suitable fast growing plants species could be established as early as possible particularly to Sariska forest area. Larger pits may be used as reservoir and fish ponds.

Reclamation of Fallow Land : These lands are easily reclaimable for cultivation but not being cultivated due to some constraints. These reclaimed land will definitely produce more food grains, pulses, oilseeds for sustainable development of the region. Proper management leading to their regeneration is great task involving following remedial measures :

1. Pre-monsoon land preparation and tillage.
2. The next stage involves field division, leveling and bunding according the slope, which will increase moisture content of land.
3. Soil testing and estimating its fertilizer quantity.
4. The first tillage during kharif prefers seasamum sowing which require lesser rain and increase the soil fertility and rabi cropping is avoided during initial year.
5. The second year cycle involves application of compost and farm manure from the dried up water reservoirs.
6. The above measure facilitates growing Kharif pulses to be followed by wheat/mustard/barley in rabi depending on irrigation facilities.

Reclamation of Culturally Wastelands : As mentioned earlier, this category includes various types wastelands, which need separate reclamation method for different category or this group. The following remedial measures for their reclamation have been often adopted.



In cultivable wasteland, most of which remain unproductive mainly due to lack of moisture, emphasis should be laid on establishing native perennial grasses which have stood test of the time in these areas and can sustain prolonged moisture stress. In order to improve soil fertility and to promote growth of grasses, suitable legumes should be also associated. It will improve nutritive value of the biomass on one hand and on the other soil fertility will also improve through symbiotic action of Rhizobia.

Conclusion: on the basis of the previous exercise and analysis of wasteland in Aravalli region of Alwar district, it will be now worthwhile to draw conclusion at this stage.

Sustainable development along with systematic policy and practice of management of Aravallis environment is under increasing pressure of the demands of population, agriculture, industrialization, urbanization and public awareness to conserve the system. The man to land ratio is continuously on the decline trend throughout last passing century and pressure on natural resources is still increasing.

This even-increasing pressure of population coupled with poor management of land and water resources in Alwar district also is putting immense stress on the fragile environment of Aravalli hill regions, which clearly indicate the need for research in the specific area. Such studies will necessarily include micro-level investigation for not only to find out the existing wasteland spatial and temporal distribution and subsequently development of these lands through watershed approach.

The present investigation of wasteland in the Alwar district of tehsil level has been undertaken with view to evaluated and analyse the spatial and temporal distribution. In this context, this study has not been only explanatory and inventory that it is of relevant applied value as well. Therefore, a study of wasteland development with watershed management point of view in the area under study is of the utmost importance.

The review of all the chapters detailed and illustrated so far, provides a comprehensive geographical perspective of the area under study in which universe of the Aravalli region and its delimitation has been dealt. Historical evolution of the district, location of the area physical setup, geomorphology, geology, drainage, climate, soil characteristics etc. and its 'B' part provides resource perspective which deals with human response and economic settings of the area.

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