Upper Hasdeo Sub Watershed Status in hasdeo River Basin At Chhattisgarh, India

Ajay K. SINGH and S. S. SINGH, India

SUMMARY

The Hasdeo river basin has eight sub watersheds which flows from Sonhat, Korea district of Chhattisgarh and flows upto 333 km and finally join Mahanadi. It is located between the north latitude of 21^0 45' to 23^0 23' and eastern longitude of 82^0 00' to 83^0 03'. The upper hasdeo sub watershed is one of the important basin part which covers 1448.52 sq. km area. This sub watersheds have 29.48% dense forest, 15.13% open forest, 37.65% non forest, 0.13% scrubland and 17.61% waterbodies. The data recorded from IRS 1D shows the different forest types eg. Sal Forest (21.90 km2), Sal mixed forest (371.99 km2, Mixed Miscellaneous forest (29.42km2) and dry deciduous forest (3.57 km2). In the upper hasdeo sub watershed area agriculture land without crop has been recorded 14.34% and agriculture land with crop has been 85.66%. The local population mainly depends on minor forest produce eg. Tendu patta (*Diospyros melanoxylon*), Mahua flower (*Madhuca indica*), Sal seed (*Shorea robusta*), bamboo species and on agriculture. Paddy, maize and legumes are the important agricultural crops.the whole upper basin area shows a pattern of sustainable utilization of the resources.

Upper Hasdeo Sub Watershed Status in hasdeo River Basin At Chhattisgarh, India

Ajay K. SINGH and S. S. SINGH, India

INTRODUCTION

Chhattisgarh state in India is well known for their availability of natural resources. This state has maximum forest cover (44%) in India with most proud Sal and Teak forest. There are more than dozen of small and big rivers flowing in Chhattisgarh. The rivers of Chhattisgarh mould the prosperity of this newly formed Indian state. Traversed by meandering rivers, the state is cocooned amidst the verdant greens, hills and plateaus. Chhattisgarh is blessed with fertile plains because of its natural drainage system. The Chhattisgarh rivers are considered as God because of its profuse provision. In Chhattisgarh important religious places have developed by various rivers. These rivers also form some of the most gorgeous rapids and waterfalls of India that attract tourists from far and wide. The main rivers flowing through the state of Chhattisgarh are Mahanadi, Indravati, Maand, **Hasdeo**, Arpa and many others. These rivers, with many other tributaries, local rivers, and streams drain the state. The northern part of Chhattisgarh shares a part of the Indo-Gangetic plain. The Satpura Range and the Chottanagpur Plateau divide the Mahanadi River basin from the Indo-Gangetic plain. This Mahanadi river basin, basically, forms the central part of the state. The southern zone of Chhattisgarh includes a part of the Deccan plateau and is served by the Godavari river and its tributaries.

The hasdeo river basin has eight sub watersheds in its total basin area and Upper hasdeo sub watershed is one of the important part. The Upper hasdeo sub watershed has been distributed in 1448.52 sq km area. This part is full of forest and rich soil. The present study deals the current status of forest, its utilization and agriculture land and its utilization pattern. This sub watershed shows a sustainable development pattern and its use by local population. Brooks et.al., 2002 have also analysed the hydrology and management pattern of watersheds and its effect on sustainability pattern.

MATERIAL AND METHODS

In the present study the parameters considered for sub watershed status in Hadeo river basin were from the natural resources thematic map data including drainage density, forest cover and its classification, soil and wastelands derived from satellite imagery and socio economic data (population in sub watersheds rural and urban). The preliminary interpretation was based on topographical sheets on scale (1:50,000; 1km) published by the Survey of India (SOI). Pre field visual interpretation of imagery was carried out on False Colour Composites (FCC) satellite image of the IRS satellite 1-D using image elements such as tone, texture, pattern, location, association and shadow following standard visual interpretation techniques. GIS applications were used for assessing the data and also interpret it. A reconnaissance survey was carried out to the whole sub watershed area.

RESULT AND DISCUSSION

The main hasdeo river basin covers an area of 10405.99 km^2. It is nearly peer shaped towards its upper and central part and funnel shaped in lower part. It is located between the north latitude of 21^0 43' to 23^0 32' and eastern longitude of 82^0 07' to 83^0 03' (fig 1). Hasdeo river is a tributary of Mahanadi flows in the stretch of 330 km from hasdeo mountain at an elevation of 1200 m. amsl about 9.5 kms north of Sonhat village in Korea district and meets in Mahanadi river at Mauhadih village of Janjgeer-Champa district. The basin has eight identified sub watersheds Upper Hasdeo (1448.59 km2) is one of them. (fig 2). The Upper hasdeo sub watershed is characterized by heavy to sparse vegetation cover, erratic rainfall and undulated lands. The climate of the sub watershed is characterized by summer and rainy months. The whole area is depend on the monsoon for high to low rain fall. The temperature varies from 20.5^0C to 41.4^0C in summer and 4^0C to 25.3^0C during winter season. Shalini Shrivastava et.al., 2002 have assess large scale deforestation in Sonitpur district of Assam and also analyse the forest pattern loss.

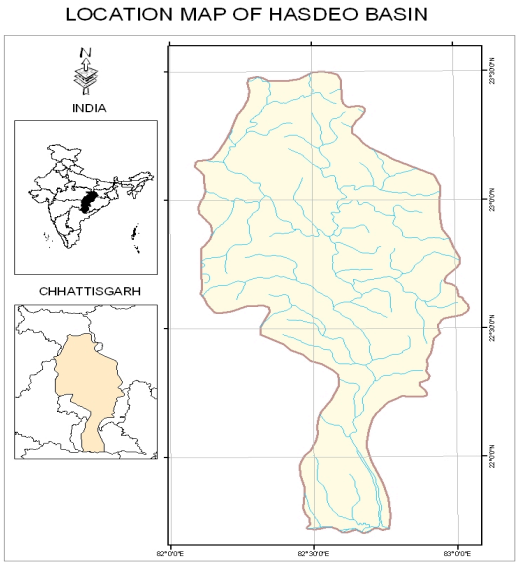


Fig 1. Location map of the hasdeo basin

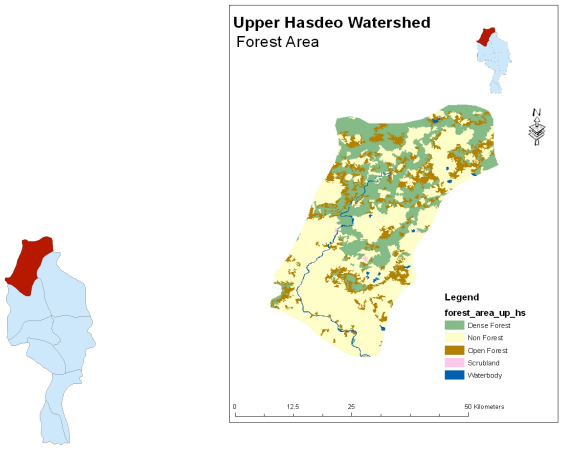


Fig 2. Upper Hasdeo sub watershed in hasdeo basin

In upper hasdeo sub watershed hasdeo forest land is classified in various categories: The dense forest covers 426.867 sq.kms and Open forest area is 549.322 sq. kms, Scrublands and waterbody covers 1.768 and 255.055 sq. kms. respectively. Table 1 shows the details of percentage of forest area.

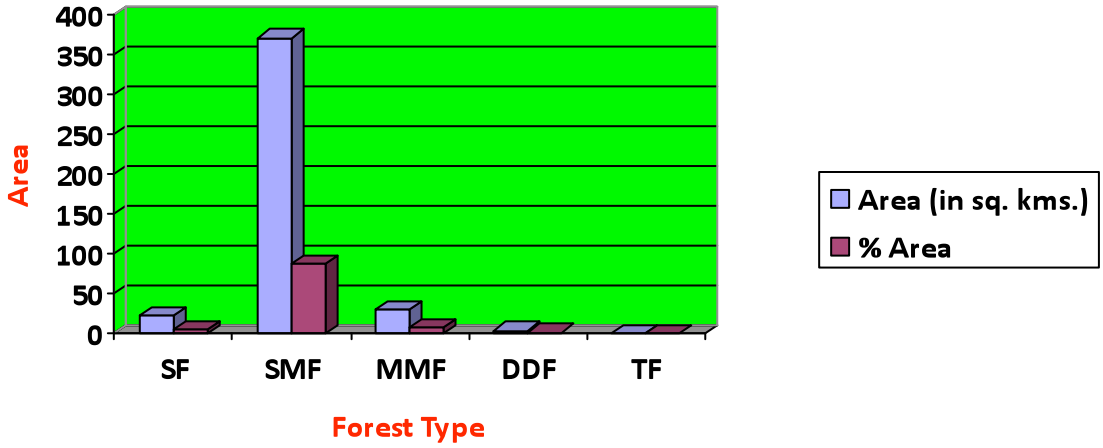
Table1.

Sl.No.	Forest Distribution	Area (in sq. Kms.)	% area
01	Dense forest (DF)	426.867	29.48

02	Non Forest (NF)	549.322	37.65
03	Open Forest (OF)	219.255	15.13
04	Scrubland (SBL)	1.768	0.13
05	Water bodies (WBD)	255.055	17.61
	Total	1448.59	100

The figure 2 shows the percentage of different forest tree domination in the upper hasdeo watershed area:

Fig 2. Dense Forest Type Distribution in Watershed



(SF- Sal Forest, SMF- Sal Mixed Forest, MMF- Mixed Miscellaneous Forest, DDF- Dry Deciduous Forest, TF- Teak Forest)

The upper hasdeo sub watershed has the following area under non forest classification which is mostly use for agriculture purposes by the local population (Table 2).

Sl.No.	Non Forest Classification	Area (in sq. Kms.)	% area
01	Agriculture land without Crop (ALWC)	78.204	14.34
02	Agriculture land with Crop (AWC)	467.118	85.66
	Total	549.322	100

In the sub watershed soil is mainly red and yellow sandy soil. The soil requires irrigation and double crop can be cropped with the irrigation facility. Variation in soil distribution in basin area is shown very clearly due to undulated structure. Maximum part of the basin is under the high elevation and heavy vegetation where the soil is variated and distributed as the condition of surround. The rest part is plain and agriculture land where the soil structure is depending upon the availability of water. Paddy is mainly grown on this soil. In some parts black soil, formed from the basalt is highly fertile soil. The black colour of this soil is because of high iron content. The soil requires less irrigation due to its water retaining quality.

REFERENCES:

Brooks, K.N., P.F. Ffolliott, H.M. Gregersen and L.F. DeBano. 2003. Hydrology and the Management of Watersheds, 3d ed. Ames, IA: Iowa State Press.

Shalini Shrivastava, TP Singh, Harnam Singh, SPS Kushwaha and PS Roy, 2002. Assessment of large scale deforestation in Sonitpur district of Assam. Curr. Sci. 82 (12): 1479-1484.

CONTACT:

Title: Prof. S. S. Singh

Job Title: Chair & Head

Organization: Guru Ghasidas University

Tel.: + 91 9424163260

Email: sssingh_ggu@rediffmail.com

Country: India

Authors: 1: Mr. Singh, Ajay K. (India) – Email: aks,ggu@gmail.com