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Sustainable Natural Resource Management by Users Group

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Abstract

Sustainable development meets the need of the present without compromising the ability of future generation to meet their own need.

The mechanism which gives a system which accommodates regular need of all natural resources without the boundary and develops for future becomes sustainable.

Some experiments has been done by Society of Hill Resource Management School (SHRMS) in Palamu District of Jharkhand State. Two adjoining villages Tandwa and Sakanpirhi in Patan Block were taken up and a number of small experiments were performed with addition of block tree plantation, water conservation and fruit plantation.

The results are optimistic and is good model for environmentally sustainable NRM. This paper deals with details of this experiment performed by academic group of SHRMS with help of rural poors and its now a replicable model for development.

Keywords: NRM of the People, By the People, For the People.

Introduction

Tandwa and Sakanpirhi village are part of Jinjoi Nala Micro watershed in Palamu Diviion of Jharkhand State, India. Attempt has been made by an NGO Society of Hill Resource Management School (SHRMS) to develop this micro watershed as an ideal replicable environmentally Sustainable Natural Resource Management unit of Patan block in Palamu District.

The work on land and water management in this micro watershed shows optimistic result for development of similar models in other water scare micro watersheds. The area falls within - $24^0$05' - $24^0$15' and $84^0$05' - $84^0$15' approached by pucca road. 30km from District H.Q. Daltonganj. The entire area is covered in village reserve forest Semra in north Jinjoi River in South and East. Saguni in the west elevation. The watershed area is situated within elevation 294 to 298 meter above the sea level and slope varies from 2% to 10%. The average slope is 4%.

Area

Total geographical area of Jinjoi Nala Micro watershed under study is 546.0 ha. Out of this total area treated is 143.0 ha.

Shape

The shape of micro watershed is almost triangular having an average length of 2705 meter and width1234 meter.

Physiography

The area has been divided into various segments. The top undulating alluvial surface has variable dip which ranges between 2^0 to 10^0 on river side. The average dip is about 4^0. Mostly the area is plain on which regular agricultural crops are taken.

Climate

Climate is sub humid sub tropical monsoon zone. It gets on an average 800-1200 mm annual rainfall. More than 70% goes as surface run-off causing down ward trend of water table. The temperature ranges between 3^0 (January) to 45^0C (June). The area being sub humid, the humidity ranges between 55% to 70% during rainy season which decreases in winter and comes to 5% - 10% during summer, the bright sunshine days is approx 220 day the area is not covered with thick vegetation thus low of water through evapo-transpiration is very low. Loss due to surface run-off is apparent.

Rock

It consists of archean, pre Cambrian gondwana recent alluvial and lateritic soil at the top. The basement of proposed watershed is made up of Chhotanagpur granitic which has been intruded by quarter and felspathic veins. Porosity of rocks is as low as 2 to 3% only, as such permeability is also less. This causes slow rate of percolation and thus

maximum water goes as run-off. However the entire upper area except few is covered by alluvial soil which is good for agriculture purpose.

Soil

Soil is sandy and sandy loam. In some parts in low lying area soil is claysilt to clay loam. Soil depth varies.

Drainage Pattern

Dendritic drainage pattern due to undulating surface. % of run-off is maximum. The surface run-off as rain wash, streamlets, streams finally join Jinjoi River and goes out of Palamu District. The objective of micro watershed work was to check surface run-off.

Natural Vegetation

Entire area was covered with thick Sal forest in past. During last 3 decades the rapid rate of deforestation, overgrazing and dependency of villagers on forest covered overall loss of biomass. However, scattered trees of Palas and Mahua, small orchards of guava and Plantation created by Chakriya Vikas Yojana during past is only vegetative cover in this watershed area.

Agriculture

Agriculture only livelihood source in this rainfed watershed area. Rice, Maize, Arhar, Wheat, Grain etc. are main crops cropping pattern and yield rate was very low.

Horticulture

Guava and Mango orchard were developed by CVP in Tandwa and Sakanpirhi villages.

External Influence

Mining

Variety of building stones are available. Mining of these stones is not regular but exploitation by villagers for survival is in practice. This caused soil erosion gullies from the top, spoiling cultivable land at the bottom.

Biotic Influence

Human Influence

Whole human population was totally dependent on agriculture but lack of irrigation facilities, grazing, lack of firewood caused unsatisfactory vegetation.

Socio-Economic Condition

Unsatisfactory Socio Economic Condition- Economically three groups were available :

1. Food available round the year (Two meals a day).
2. Food not available round the year (One meal as fund)
3. Food availability is difficult and they were dependent on root crops.

Visually it was found that houses are mainly Mud, Kaccha constructions, Financial condition was miserable. The rainfed agriculture was not sufficient for the area as livelihood option.

Land Holding

Mostly people are marginalized farmers with 3-5 hactre land holding.

Onput

The micro watershed development program was executed in succession to Chakriya Vikas works which added additional irrigation arrangement, Orchard developments, improved agricultural practices. Training monitoring, capacity building of the rural poor, block plantation of mixed fuel, timber variety and multilayered vegetative system improved biomass condition.

The catalytic cordon support by NGO SHRMS in implementing its participatory Chakriya Vikas Yojana and Micro Watershed development work brought villagers on common platform.

Some Additions

Nursery	Rs. 340000.00	75000 saplings
Plantation	Rs. 415000.00	75000 plants
Soil Moisture Conservation	Rs. 160000.00	80 hec
Tie Ridges	Rs. 160000.00	80Hec
Korkar	Rs. 97360.00	33Hec
Repair of Ahar at Tandwa	Rs. 92195.00	1
Repair of Ahar at Bikua	Rs. 56900.00	1
Creation of Water Channel	Rs. 86748.00	at Sakanpirhi. 2500 feet
Reparing **Ahar** at Nawada	Rs. 55130.00	1
Land leveling - 25 ha.	Rs. 55398.00	25Hec
Horticulture	Rs. 34350.00	10Hec
Total	**Rs. 1553081.00**	

Output

With addition of above input which itself was not sufficient for the area. The total expenditure on watershed development project was only 40% of the total projected outlay. The data collected from the villages before and after the project clearly reveals improvement in socio-economic status, biomass cover, ground water potential and quality of life due to gain from the massive work done within the project boundary.

The socio-economic change was evidenced by increased in sense towards protection of created assets, regular discussion on the local issues which resulted complete social fencing over plantation areas spread over 200 acres of land. With increasing grass in protected village forest stall feeding of cattle became practice. It resulted regularly increasing Milk production in the village. This clearly indicates improvement of economic status of rural poor. The villagers decided to improve literacy and for this purpose they opened a private school in Tandwa and controlled the teaching of government school in the village through proper monitoring. The elders learn the management techniques to COPOR management of SHRMS. The increasing number of participants in the village meetings clearly shows interest of villagers. Each family grows sufficient vegetables for family use and surplus of onion/potato and sugar cane are being marketed in Truck load to different distant places. The mango and guava fruit gardens are given on yearly tender to "Kunjras".

The basic fuel/fodder need is met by prooning of trees in the village increasing water table gives sufficient potable water in Ponds/Wells/tube wells for drinking and irrigation purposes. From the village fund generated in the villages some local entrepreneurship is being developed.

With increase of forest stock it was essential to quantify it overtime. For this two techniques were used. In village Tandwa 15 blocks of 100 Mx100M were selected and coverage of 25-65 m^3/ha forest stock over 5 years were evaluated.

In village Sakanpirhi all the standing trees over an area of 36.1 ha. were counted and the volume of standing trees were measured which gave an average of 25.04 m^3/ha. Thus the standing crops at the moment estimated to have market value of Rs. 100000/ha @ Rs. 4000/m^3 in these two villages. The total investment from all sources in the village comes about Rs. 16000/ha. The tree stock has covered a large part of the area, so water level has improved. This enhanced agricultural crops overtime the water is being Channelized by Earthen Channels and the villagers are getting better crop yield. The overall nature of rural poor is changing with time due to availability of employment opportunity at door steps.

Economic accounting of resource management as argued by Kadekodi and Chopra (2000) resource accounting will give very clear picture after completion of one complete cycle of 15-20 years, though,this is yet to complete but one may use a cost benefit of such other methods for setting the bench mark for replication of similar efforts in other villagers. At the time of analysis following regeneration benefits were noticed.

1. Increment in crop yield.
2. Creation of Woody biomass.
3. Increase in fruit yield.
4. Assets of soil, run-off, increase in soil moisture.
5. Increase literacy.
6. Increase in gainful employment.
7. Fuel wood and leaf biomass.

Geophysical Accounting

Vertical Electrical sounding (VES) reveals better layer of ground water within the project boundary while it is reducing outside the area. This variation was also supported by similar fluctuation of water table in the open wells and ponds in the area. The fertility of soil has improved with the project and good crop yield is increasing confidence among the villagers.

Conclusion

This participatory model of development is an environmentally sustainable natural resource management for this area.

References

1. Sinha S.P., PhD Thesis 2012, Ranchi University.
2. Sinha S.P., Paper in Anushandhan 2011, December.
3. Sinha S.P & Jaiswal B.K.- Paper in Anushandhan 2012, December.