

# Peoples' Effort for Ecology Restoration Using Effective Water Management Based on Remote Sensing and Geographical Information System



**S.P. Sinha**

Associate Professor,  
Deptt. of Physics,  
N. P. University,  
Medininagar, Jharkhand

## Abstract

Palamu District, now Division of Jharkhand was known for dense forest and abundance of mineral resources. In 1926 the forest cover was 75%, which gradually reduced and by 1985 it came down to 28-30%.

This paper explains the system development mechanism with ground status evaluation of Jorkat village in Palamu District. The small efforts for in situ conservation of water on as it falls where it falls basis became catalyst. The outcome of effect was optimistic. A system of self-help became practice for all works in the area. The area was demarcated on the basis of Remote Sensing and GIS. The maps shows available water.

**Keywords:** Food, Fodder, Fuel, Fiber & Fresh Water.

## Introduction

Due to regular and erratic deforestation, poverty, greed, unemployment, dependency on forest the forest cover of Palamu Division in Jharkhand State reduced to less than 35% in eighties from 85% .

In 1986 a sensitive group of young professionals from Academics, Administration, Forests and Researcher joined together to study the reason and to find out a lasting solution for restoration of degraded forest and environment in the area.

A case of Khapiya village was taken for analysis. The outcome was that entire village was poor and forest dependent exploited at each and every step and getting minimum survival support with feeling of guilt of theft of forest resources.

This group (of which author was also active member) started finding solution and initiated a pilot project at Khapiya, Chhechani and Marhi villages. Regular work in nursery, plantation and protection was given to all workable person of village for 3 years and the result was very optimistic. This was done with help of forest department.

The regular head loaders having sole means of survival with theft of forest resources became change agents and worked as protectors of forest resource over time.

That was a turning point in the group discussion and as result an NGO Society of Hill Resource Management School (SHRMS) was formed and registered on 26.09.1986 with IG Registration Bihar u/s XXI of 1860.

This society worked tirelessly and increased the cordon to more than 70 villages overtime. The idea was to give catalytic cordon support to grass root groups and monitor their developmental programmes through its staff specially trained for the purpose.

Working mechanism of SHRMS was termed Chakriya Vikas Yojana. In this system village community of 90-100 families form a group. They elect executive body. This executive body works for the group keeping in mind the need based solution to the village. Micro plan is drafted with PRA under expert guidance of SHRMS staff. The work is done by the grass root groups called Chakriya Vikas Samaj. The objective is to get partnership for creation of land and water based suitable system.

## Motto

Self-reliant system for the masses.

## Principles

1. Clear Shared vision of the mission.
2. Flexibility of operation for achievement of goal.
3. Sufficient time span for internationalization of the system by the partners.

4. Periodic evaluation of the feedback and tuning for better further programs and plans.
5. Spiral growth of collaborative efforts.
6. Sense of commitment and responsibility.
7. Zeal, drive and comprehension capability, enhancement of stakeholders.
8. Long term sustainability efforts.
9. Same parlance of all stakeholders.
10. Sustained effective leadership from the community for goal achievement.

**Methodology**

1. Formation of effective grass-root group.
2. Pooling privately owned land and other assets for common benefits.
3. Development of commonly pooled privately owned land for common benefits.
4. Introduction of transparent accounting system.
5. Creation of assets with active people participation and empowering the disadvantaged and weaker section of the society in decision making processes too.
6. Maximization of productivity through innovative layered vegetation and multiple cropping system.
7. Equitable sharing of benefits in 1:3:3:3 pattern.
8. 1 10% Kalyan Kosh : 3 30% land owner's share : 3 30% community fund 3 30% Development Fund.
9. Work for expansion of activities through awareness among participants towards urgency and need of support to adjoining area through asset created at local level.

**Achievement**

1. Conceptualization of an innovative system called Chakriya Vikas which is technically Common Pooled Resource Management system.
2. This system developed by SHRMS has been internalized by Bihar, Jharkhand and West Bengal states in their Joint Forest Management Program by Forest Department.
3. Govt. of Bihar, Forest Department shares benefit in the ratio of 1:1:1 Jan Nidhi, Van Nidhi and Gram Nidhi in JFM of Forest Department.
4. Govt. of Jharkhand has 1:3:3:3 pattern of sharing benefits of usufructs.
5. 1 10% Kalyan Kosh : 3 30% Van Nidhi : 3 30% Jan Nidhi : 3 30% Gram Nidhi
6. This system gives scope of maintaining the forest in participatory manner.
7. Formation of Operational Mechanization as package program.
8. Strengthening 60+ village as Chakriya Vikas Groups with more than Rs. 20 lakhs as village development fund which works as a safety net for these groups.
9. This village fund is managed by Grass root groups.
10. Catalytic cordon support to all these Grass root groups.
11. Mental, moral support to 40+ NGOs in the state of Jharkhand.
12. Imparted training to more than 3000 GO/NGO/Farmers on Land and Water over time.
13. Worked in 27 micro-watershed over 1300 hectare of land.

**Model Project**

For experimentation a small patch of 95 ha. was identified. On the basis of ground water data, topography and study of flow direction a water map was

prepared and on the basis of it local level action plan was prepared and executed as detailed below : development project was operationalized in Jorkat village during 2002-2007 over 250 hactres of land through the work completed was just 40% of the proposed plan. The overall impact was affirmative the beauty of the plan was that all efforts were to arrest rain on as it fall and where it falls basis. The only systematic scientific input was that the land and water quantum analysis was done through standard VES analysis and sites were selected on the basis of drainage pattern analysis by authors group. The action plan consists of:

Sl. No.	Activity	Rate	Area	Amount
1.	Bench Terracing	@ 3000/-ha.	40 ha.	1,20,000
2.	Big Tie Ridge	@ 4000/-ha.	25 ha.	1,00,000
3.	Aforestation	@ 6000/-ha.	10 ha.	60,000
4.	Agro Forestry	@ 7000/-ha.	10 ha.	70,000
5.	Horticulture	@ 8000/-ha.	10 ha.	80,000
6.	Construction of 2 Water harvesting tank			2,60,000
7.	Construction of 10 Earthen Bundh			1,15,000
8.	Construction of 5 Loose bolder check dam			60,000
9.	Construction of 200 Channel			40,000
<b>Grand Total</b>				<b>9,05,000</b>

All these works were completed in 2 years and the outcome was evaluated for for-closure of the project.

1. The productivity of the area increased.
2. The water was available for seasonal crops even in drought like conditions.
3. People's group became active and initiated active participation in MNREGA and other development programs.
4. The number of trees and the forest cover is apparent all through the Daltonganj-Ranchi route.
5. The overall environmental condition improved.
6. The People's group became active in formulation of Self Help Groups.
7. These self-help groups were all made to get linked with Banks.
8. The overall ecology and environment of the area improved giving better living and socio-economic condition to the people of Jorkat village of Palamu.

**Conclusion**

The SHRMS Chakriya Vikas Yojana is a viable replicable alternative model of rural development with internal mechanism of developing surplus resources for all times to come.

In due course of time the IRR [Internal Returnable Revenue] becomes sufficient to take care of all development program of the village. It needs inclusion in state and National policies like Water for all, food for all and Employment for all in future plans.

**Reference**

1. Microplan for Jorkat micro watershed prepared by SHRMS 202-2007.
2. Sinha S.P., Verma P.K. - Paper presented at ICEM, JNTU, 2005.
3. Sinha S.P. - Key Note address, ICEM, JNTU, 2005.