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Joint Forest Management in Haryana: Assessment of performance and evaluation of impacts

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ABSTRACT

A participatory approach to forest management popularly known as Joint Forest Management (JFM) organized at a grassroots level by community-based institutions has been implemented in India since 1970s and is considered, by and large, to be successful and an ideal forest management model in the present world forestry scenario. The present article tries to examine and evaluate the impact assessment of Joint Forest Management policy on the social, economic and ecological equilibrium of village level institutions working in the *Shiwalik* foothill region in Northern India in Haryana state. It further analyses the emerging policy issues confronting joint forest management as a result of revised JFM notification in 1998 issued by Government of Haryana. The main controversial feature of revised notification has been its new benefit sharing system between Haryana Forest Department (HFD) and Hill Resource Management Societies (HRMS). As a result, the income of all the JFM committees declined by 50 to 75%. Many of these committees functioning with great success have altogether collapsed for want of funds after the issuance of revised notification and sudden decline in the demand of *bhabbar* (*Eulaliopsis binata*) which needs immediate attention.

1. INTRODUCTION

Joint Forest management (JFM) has tremendous possibilities for changing the face of rural India by poverty eradication. About 147 millions people living in 1,70,000 villages of the country are completely or substantially dependent on nearby forests to meet their livelihood requirements. JFM programs currently span 27 states, represent 85,000 village committees, and cover more than 17.3 m ha of forest land. The programs encompass an estimated 8.3 million families, half of which are Scheduled Castes and Scheduled Tribes (Bhattacharya *et al.*, 2008).

The JFM resolution, though broadly laid similar pattern at the national level, various states have their own peculiarity and different types of mechanisms have been adopted with regard to constitution of JFM committees, usufructs sharing, gender issues and protection mechanisms for the execution of the programme (Rathore *et al.*, 2005). Haryana state in Northern India has been the pioneer state in the implementation of Joint Forest Management (JFM) Programme in the country. The genesis of the programme dates back to early 80s when the Chandigarh Research

Centre of the Central Soil and Water Conservation Research and Training Institute (CSWCRTI) and Haryana Forest Department (HFD) started an experimental programme for the involvement of local people in the management of *Sukhomajri* and *Nada* watersheds in lower *Shiwaliks*. The *Shiwalik* hills cover approximately 68,000 ha of area along the northern border of the state. A large number of rainy season torrents flow down the slopes of *Shiwaliks* and deposit a lot of gravel, boulders, pebbles and sand in the riverbeds and agricultural fields down below. The present article tries to examine and evaluate the impact assessment of Joint Forest Management policy on the social, economic and ecological equilibrium of village level institutions working in the *Shiwalik* foothill region in Northern India in Haryana state. An attempt has also been made to study the implications of JFM policy in view of its revision in 1998.

2. MATERIALS AND METHODS

This section gives details of the Joint Forest management in the study area followed by the sampling design and the methodology of the study.

Overview of the Study Area and Programme Description

Haryana was among the first few states to issue the circular on JFM in June 1990. The basic philosophy underlying the Joint Forest Management Programme was to tie the economic interests of villagers living adjacent to the forest with sustainable management of these areas. This was to be achieved by identifying one or more catalysts (could be water, fodder, *bhabbar* and trees) in each village which could motivate villagers to improve the productivity of forest areas while giving them a major share of the forest produce resulting from their participation in management. The Joint Forest Management (JFM) Project was responsible for developing an integrated model of watershed management based on experiments that were undertaken in the village of Sukhomajiri between 1975 and 1985 (Arya and Samra, 1995a). The project was crucial to reduce siltation of the Sukhna reservoir located further downstream in the state capital of Chandigarh. Central Soil and Water Conservation Research & Training Institute (CSWCRTI) and Haryana Forest Department (HFD) developed a strategy to provide water for irrigation to neighboring communities by building earthen water harvesting structures (dams) in or near the forest area.

For sustaining the interest of the villagers in protection and management of the forest and to regulate water distribution, Water Users' Association was reorganized into Hill Resource Management Society (HRMS) registered in 1984 under the Societies Registration Act (1860) with responsibilities of: (i) protection of forests against grazing and illicit felling, (ii) distribution of irrigation water, (iii) fixing of rates for water, grass, *etc.*, (iv) maintenance of dams and water distribution systems, (v) maintenance of accounts, and (vi) cooperation and interaction with the staff of the Forest Department. Each household was represented by one male and one female in the General Body of the HRMS. All adults of all families in the village were free to become members of the society, thereby sharing equal rights and responsibilities.

The JFM programme at present, is spread over approximately 19,840 ha of forest areas of two forest divisions Pinjore-Raipur and Yamunanagar situated in the lower *Shiwalik* foothill region in Haryana state. About 4,500 families in 58 Hill Resource Management Societies (HRMS) are involved with the state forest department in protection and management of forest.

Sampling Design and Methodology

For the purpose of the study, 37 HRMS were surveyed during the first round to find out the actual number of HRMS constituted and continuing at present. The survey revealed that about 13600 ha of forest area was being protected and managed by 37 societies. However, only 10 HRMS were found to be working successfully and

consistently since their date of inception. So the detailed data were collected from these 10 HRMS for the study since their inception till 2004. Since most of the successfully working societies under JFM also collapsed after the introduction of New JFM policy in 1998 due to the implementation of new benefit sharing system, not much information was available after 2004. However, the data on revenue earned by various HRMS was collected through account books maintained by these societies. In-depth interviews, informants and observations were used while collecting primary as well as secondary information from the officials of the forest and other concerned departments. The impact of the programme was evaluated through various evaluation and impact studies conducted by the centre over a period of time at various intervals. The data regarding change in vegetation over a long period was available for three watersheds as it needed complete monitoring and the same has been discussed in the following section:

3. RESULTS AND DISCUSSION

Impact of JFM on Production from Forest Area

It needs no emphasis that rain water harvesting reservoirs constructed under JFM programme not only met people's basic water needs for agriculture and livestock but had also been instrumental in building monetary and social capital in a society through community management of common property resources like forest and water. It was the beginning of people's participation in environmental preservation, management of common property resources and above all harnessing the best out of private property resources (Bhumbla, 1976; Bhumbla, 1980; Grewal *et al.*, 1997; Mishra *et al.*, 1980, Mittal *et al.*, 1986, Arya and Samra, 2001). The *Shiwalik* hills of Haryana are mostly inhabited by pastoral communities and the livestock density per sq km is almost double (223 standard livestock units) of the State average (119). The high livestock populations, fodder grasses are obtained from the forests where extraction is regulated through *dati* system and is restricted to the period between October to March. One *Dati* means one and two *Dati* means two members of a household can go to the forest daily to fetch a head load of grass for the specified period and pay the contractor or the Society a fixed amount of fee. Under the earlier system wherein the contractor was given lease for the forest areas for harvesting fodder grasses, the communities had to pay a higher fee (*dati*) which ranged from ₹ 700 to 1000 household⁻¹ season⁻¹. However, with lease being given to the HRMSs under the JFM, the *dati* now ranges between ₹ 50 and ₹ 350 member⁻¹ season⁻¹. The lower *dati* rate and increased fodder availability from the forests, due to protection, and from the agricultural fields has encouraged stall-feeding and put an end to open grazing, resulting in enhanced productivity of grasses and protection of tree species, eventually leading to

Table: 1

Increase in fodder and commercial grass productivity and decrease in fuel wood extraction from common lands in the three monitored watersheds

Watershed	Fodder grass Productivity (t ha ⁻¹)			Commercial grass-bhabbar (t ha ⁻¹)			Decrease in fuel wood extraction (t household ⁻¹ yr ⁻¹)			Source
	Pre-project	Post-project	% increase	Pre-project	Post-project	% increase	Pre-project	Post-project	% decrease	
Sukhomajri	2.47 (1979-81)	5.05 (1992-93)	104	1.35	2.67	98	4.79	2.35	50	Mittal <i>et. al.</i> , 2000; Arya and Agnihotri, 1993
Bunga	0.20 (1984-85)	3.20 (1994-95)	1500	negligible	0.69	NA	4.52	2.39	47	Samra and Dhyani, 1998; Samra and Singh, 1995; Arya and Samra, 1998
Nada	0.0 (1980-81)	5.42 (1992-93)	NA	0.90	4.31	378	5.02	3.14	38	Grewal <i>et al.</i> , 1997

environmental security. Stall-feeding has also changed the livestock-mix in favor of buffaloes. Apart from the increase in productivity of fodder grasses in the common forest lands, the production of commercial grasses like *bhabbar* (*Eulaliopsis binata*) also increased in many watersheds due to complete protection of the forest area in *Shiwalik* foothill villages through “*Social Fencing*” by the Hill Resource Management Societies (Table 1). Social fencing is self-restraint by villagers themselves from cattle grazing and illicit felling/cutting of vegetation in the forest area following rules and regulations framed by local communities constituted for the protection, management and distribution of CPRs. The increased crop yields resulted in reduced pressure on the forest for fodder and fuelwood. The communities voluntarily decided to stop grazing their livestock in the forest. The number of goats decreased and villagers resorted to stall feeding their cattle instead of open grazing.

It needs a special mention here that *bhabbar* is one of the most important non-timber forest produces of Haryana *Shiwaliks*. Of the 68000 ha forest land in Haryana *Shiwaliks*, approximately 20,000 ha land produce *bhabbar*. This is the most important of the fibre grasses as it is a primary raw material for rope and paper making industries.

Prior to the formation of HRMS, the Haryana Forest Department used to allot the whole of adjoining area on lease basis for raising *bhabbar* and fodder grasses. The analysis indicated that yield of *bhabbar* grass was much higher in the forest area being managed by Hill Resource Management Societies (Fig. 1) as compared to the Forest Department, Govt. of Haryana and private contractors (Arya and Samra, 2001). The yields declined after 1998 as HRMS stopped taking the lease of forest areas for raising grasses which has been discussed in the following section.

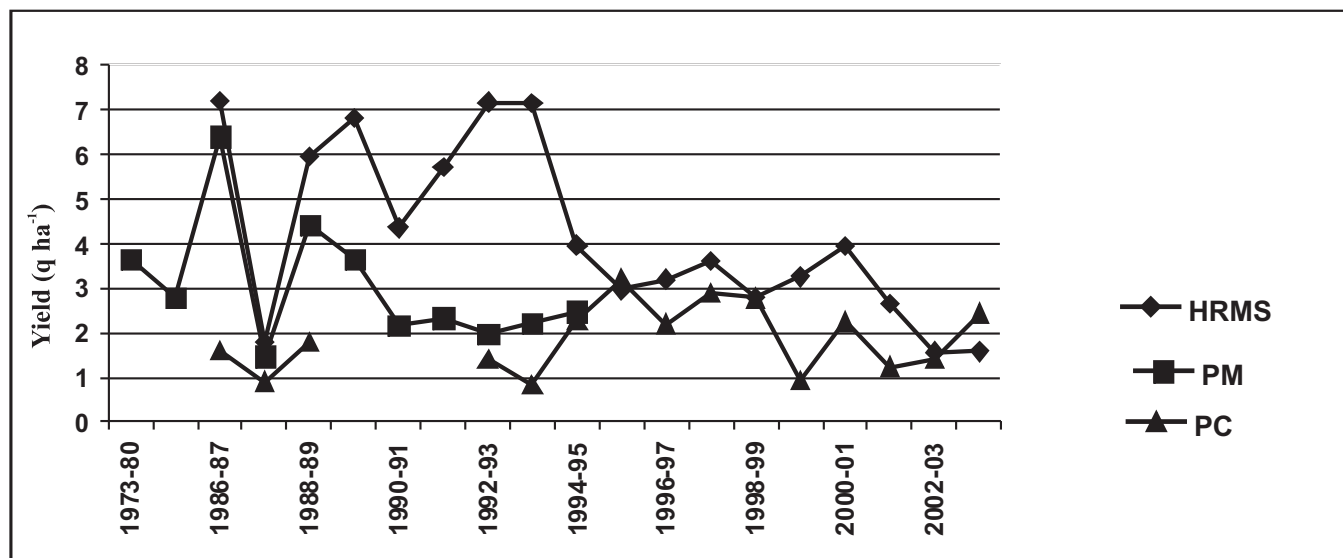


Fig. 1. Comparative analysis of *Bhabbar* yield of forest area allotted to HRMS, Private Contractors (PC) and Paper Mills (PM) (1 quintal = 100 kg.)

Table: 2
Increase in tree density in the community managed watersheds

Watershed	Tree density (No. ha ⁻¹)		% increase
	Pre-project	Post-project	
Sukhomajri	58 (1979-80)	308 (1992-93)	431
Bunga	7 (1983-84)	23 (1993-94)	228
Nada	175 (1980-81)	586 (1992-93)	235

Intensive soil and water conservation measures were adopted in the catchment areas before and during the plantation in the watersheds. Due to protection of the catchment area by the local community institutions established for the purpose, the tree density increased manifold as is evident from the data presented in Table 2 for the five selected watersheds. Thus the social fencing helped in significantly improving the ecological security of the area apart from monetary benefits through sale of fuelwood and timber.

Impact of Common Pool Resource Management on Income, Employment and Crop Productivity

The two most important common property resources managed by the HRMS constituted on Sukhomajri pattern in *Shiwalik* foothill villages in Panchkula district of Haryana for maintaining and sustaining the watersheds are forest lands adjacent to the villages and water storage structures. The increase in production of fodder and *bhabbar* grasses in the catchments areas due to complete protection by the societies by adopting the concept of '*Social Fencing*' is directly reflected in terms of revenue generated over a period of time (Arya and Aggarwal, 2004). Total income generated by ten HRMS is presented in Table 3. Institutional management of common property resources like forest and water has not only resulted in increasing the productivity and income of CPRs but also boosted the economy of the villagers through increase in income, employment opportunities and productivity of private lands. This fact has been well supported in the literature (Arya and Samra, 1995; Arya and

Samra, 2001; Arya, 2005; Dhyani *et al.*, 1997; Samra and Mishra, 1998; Sharda *et al.*, 2006; Yadav *et al.*, 2005; Kotwal *et al.*, 2008). Community management of natural resources have been also very successful in Kerala (Samuel, 2010) and Tamil Nadu (Sikka *et al.*, 2014).

Thus, CPR management essentially has a strong bearing on sustainable development of agriculture land of small and marginal farmers as evident from high benefit cost ratios of successfully managed watersheds (Table 4).

Economic Benefits in Terms of Food Security

Wheat production, the staple winter grown *rabi* crop, has increased several fold in response to irrigation input provided by the water harvesting structures. Earlier, the average yield was 900 kg ha⁻¹ (360 kg acre⁻¹), owing to deficient soil moisture, scanty and uncertain rains. The present scenario of yields of major crops ranges between 1330 to 2000 kg ha⁻¹ for rice, 4500 to 5500 kg ha⁻¹ for maize and 3500 to 5000 kg ha⁻¹ for wheat. Villagers now sell their

Table: 4
Impact of JFM projects on productivity, employment and economics

Watershed	Percent increase			
	Cropping intensity	Productivity	Employment	B.C.R.
Sukhomajri	82	210	38	2.06
Dhamala	78	165	18	1.97
Bunga	134	170	62	2.49
Lohgarh	127	194	34	2.01
Gobindpur and Mandappa	89	78	39	1.78
Masoompur	76	85	43	1.59
Raina	64	74	37	1.36
Khera and Basaula	92	89	51	1.71
Mirpur	82	92	49	1.67
Nada	78	165	18.6	1.97

Table: 3
Total income (₹) of ten Hill Resource Management Societies operating in Haryana (1983-84 to 2003-04)

S. No.	HRMS	Period	Income (₹)	Source of income
1.	Sukhomajri	1986-2004	13,75,995	W.H., B, F, Fh
2.	Dhamala	1989-2002	7,81,277	W.H., B, F, Fh
3.	Bunga	1984-2004	16,62,163	W.H., B, F, Fh
4.	Lohgarh	1990-2002	16,13,682	W.H., B, F, Fh
5.	Gobindpur & Mandappa	1988-2004	2,53,007	W.H., B, F, Fh
6.	Masoompur	1988-2004	6,58,870	B
7.	Raina	1988-2004	7,47,740	B
8.	Khera & Basaula	1995-2002	4,82,275	B
9.	Mirpur	1991-2004	2,19,704	B
10.	Nada	1994-2002	1,38,806	W.H., B, F, Fh
	Total		79,33,519	

B = *Bhabbar* grass; F = Fodder grass; W.H. = Water Harvesting; Fh = Fish

agricultural produce, though on a small scale, in contrast to the earlier situation when cereals and pulses had to be purchased. Increased agricultural residues and growing *berseem* (green fodder), which can be harvested till mid-April, has eased the problem of fodder shortage. Earlier, the *Gujjars* (traditional graziers) used to migrate with their cattle to cooler parts of Punjab, Himachal Pradesh, and Uttar Pradesh for almost eight months a year in search of green fodder which has now been reduced to about four months.

Joint Forest Management Policy Post 1998 and Impact on Usufruct Sharing

The Government of Haryana issued revised Notification called "Haryana Joint Management of Forest Areas Executive Instructions, 1998" covering all Government owned forest in the State vide letter No. 3799-Ft-1-98/13358 dated 29.6.98.

The main controversial feature of revised notification has been its new benefit sharing system between Government (HFD) and Hill Resource Management Societies (HRMS) (Fig. 2).

Under the old system (before 1998), forest department agreed to lease fodder grass and *bhabbar* from forestland to HRMS(s) on the basis of last three years' average price which the contractor used to pay to the department. Thus, after paying the lease amount to the department, the total

earnings from resale of *bhabbar* and fodder remained with the society and this was considered to be net profit/income to HRMS(s). Every year an increase of 7.5% was added to the lease amount in order to compensate for inflation, besides income tax @ 15.3% and sales tax @ 8.8% which remained a common practice even in the new system.

Under the new sharing system (after 1998), the villagers' needs of *bhabbar* are taken care of, the net profit has to be shared between the HRMS and the government. The net profit as usual is arrived at after deducting the lease amount (including income as well as sales tax) from gross sale amount of *bhabbar* and fodder grass, as mentioned in the previous paragraph.

While 25% of the net profit goes to the government as revenue, the rest 75% is again shared between society and forest department. One-tenth of this 75% share goes to *Kalyan Kosh* (village welfare fund under direct control of Divisional Forest Officer (DFO)), which is deposited in a state level account. The concerned DFO maintains this fund as Personal Ledger Account, to be operated with due concurrence of the Principal Chief Conservator of Forest / Chairperson of State Working Group (SWG) as authorized by the SWG bill. The *Kalyan Kosh* is utilized for the expansion of the JFM programme in the state of Haryana and for promotion of activities of the HRMS(s).

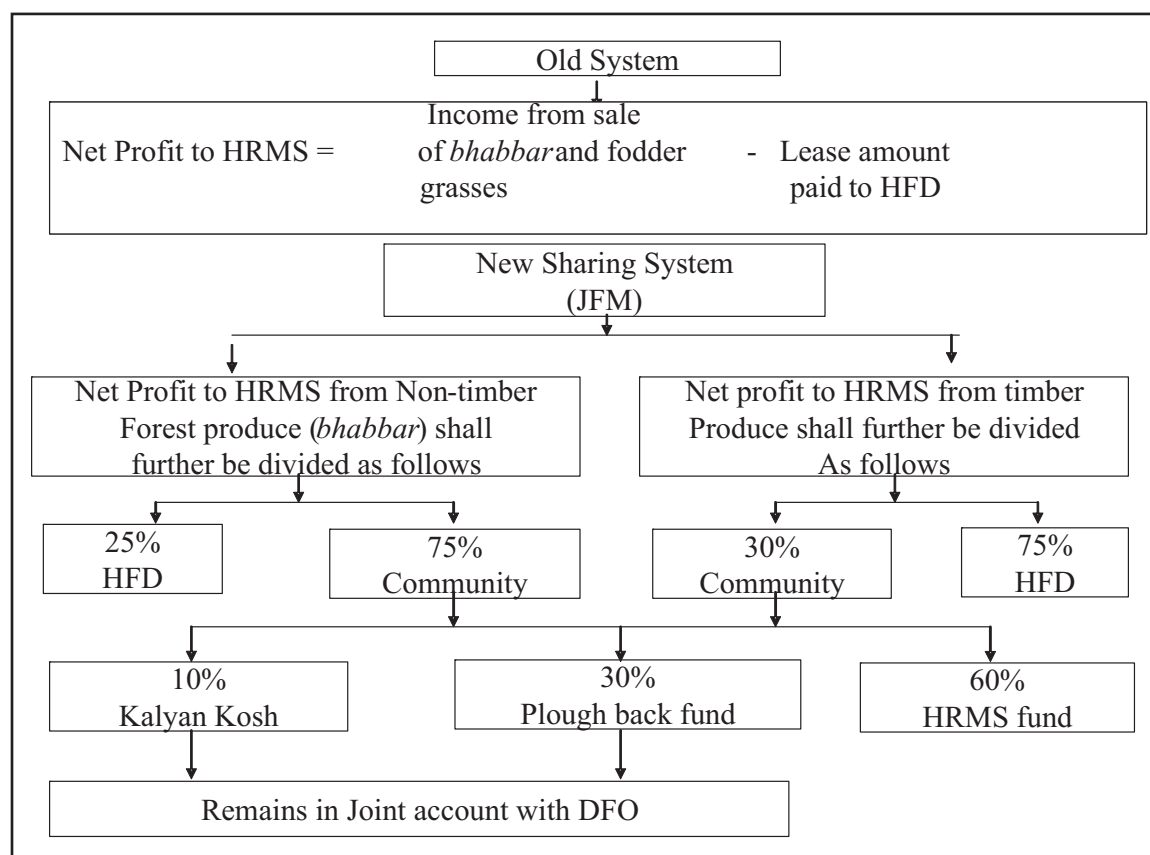


Fig. 2. Benefit sharing systems between HRMS and HFD in Haryana

Another 30% of the 75% share goes to *Plough Back Fund*. This fund would be set up at HRMS level from the contribution made by an HRMS, an annual contribution of 30% of the HRMS share from the proceeds of sale of surplus *bhabbar* and 30% from share of timber. This fund would be retained by each HRMS as separate bank account jointly operated by DFO and the concerned HRMS functionary with due approval by the General Body of the HRMS.

The rest 60 of 75% share belongs to HRMS and is to be used by the village community. Only this fund would be maintained solely by HRMS as a separate bank account to be operated by the cashier and any of the other two office bearers with due approval of the General Body, according to the procedures stated in the bye-laws of the society.

After the adoption of revised sharing system of profits between HRMS and Government department, the income of all the JFM committees have decreased by 50 to 75%. The detailed information was collected from 10 successfully working societies (before 1998) which indicated that after the introduction of new JFM notification in 1998 involving new benefit-sharing system, the income of all the societies reduced by 45% in the first year (1997-98) and in certain cases by more than 75% in the subsequent year (1998-99). From 1999-2000 onwards, the income has gone down drastically. For example, in case of Masoompur society, the income has gone down from ₹ 93,063/- in 1997-98 to just ₹ 5,392/- in the year 2002-03 over a period of five years (Table 5).

The societies working in Pinjore range have altogether collapsed for want of funds. The two main reasons for loss of income to HRMS were recorded as (i) introduction of new sharing system and (ii) reduction in demand and market value of *Bhabbar* (*Eulaliopsis binata*) which was the major source of income to societies. Neither the HRMS themselves nor the private contractors were ready to take the lease even at the lowest offered price because harvesting,

grading, drying and transportation of *bhabbar* is very costly which comes to about ₹125 q⁻¹. Due to non-harvesting of grass in the forest area, the incidences of fire increased. In the Pinjore Forest Range only, the fire incidences occurred 24, 5, and 14 times, respectively in the years 1999, 2000 and 2001 as compared to 1.7 yr⁻¹ taking the average of 15 years from 1984 to 1998 causing damage to 1021 ha area. Due to non-harvesting of *bhabbar*, its production declined as is clear from the data presented in Fig. 3. The production reduced drastically after 1997-98.

The much publicized and frequently quoted self sustaining SUKHOMAJRI MODEL has lost its relevance as far as functioning of HRMS is concerned in the context of JFM policy. The HRMS of Sukhomajri which earned more than ₹ 14 lakhs in the last 20 years is now virtually bankrupt.

In the past, low cost lease rates provided the required support to the community for sustaining the benefits which were mainly limited to *bhabbar* and forage grasses. Very little effort was made to define the sharing rights for long maturing shrubs and trees planted in the watershed. However, as per the new JFM Policy, various other items like timber, *katha* (tanic acid obtained from heartwood of *Acacia Catechu*), bamboo etc. have been included in the list for which sharing will be done in the ratio of 30:70 between the communities and the department. It is stated that communities will have the obligation to protect the grasses and trees but the major part of the benefits would be shared by the department as per the Joint Management Agreement (JMA) (issued by Government of Haryana, Forest Department, dated 29.6.1998).

The sustainability of the HRMS, at present, is at stake for want of viable alternative. The alternative paradigm of participatory development is undergoing a vigorous churning and appearance of conflict or new realities in the transition phases of a social process of resource conservation for livelihood gathering is quite natural.

Table: 5

Comparison of new benefit sharing system under JFM with old system in terms of net income to HRMS from sale of *Bhabbar* grass

S. Village No.	Gross income from resale of <i>Bhabbar</i> (1997-98) (₹)	Share of HRMS in 1997-98		reduction % in profit in new system vs. old system	Share of HRMS in 1998-99 (New System)	Percentage reduction in profits in 1998-99 over 1997-98	Share of HRMS in the year				
		Old* System	New System				1999-2000	2000-2001	2002-2002	2003-2003	2003-2004
1 Sukhomajri	95,000	68140	30663	45	7784	75	Nil	Nil	Nil	Nil	Nil
2 Dhamala	135000	106458	47906	45	23534	51	Nil	Nil	Nil	Nil	Nil
3 Lohgarh	303000	266852	120083	45	47183	61	10733	12983	Nil	Nil	Nil
4 Jatanmajri	40000	25881	11646	45	8947	23	2124	Nil	-	Nil	Nil
5 Khera	40000	32305	14537	45	9376	36	8237	Nil	-	Nil	Nil
6 Basawal	20000	12121	5955	45	2755	54	Nil	Nil	-	Nil	Nil
7 Gobindpur and Mandappa	28500	27159	12222	45	6597	46	8398	7590	3000	2323	2323
8 Masoompur	100000	93963	42283	45	27883	34	15431	8478	5528	5392	5498
9 Raina	120050	112009	50405	45	16632	67	16642	14618	17319	6292	11018
10 Mirpur	31000	28312	12741	45	7341	42	2844	1928	1853	594	144

*In case of old sharing system, the profit of HRMS is estimated while actual profits are given for the new system

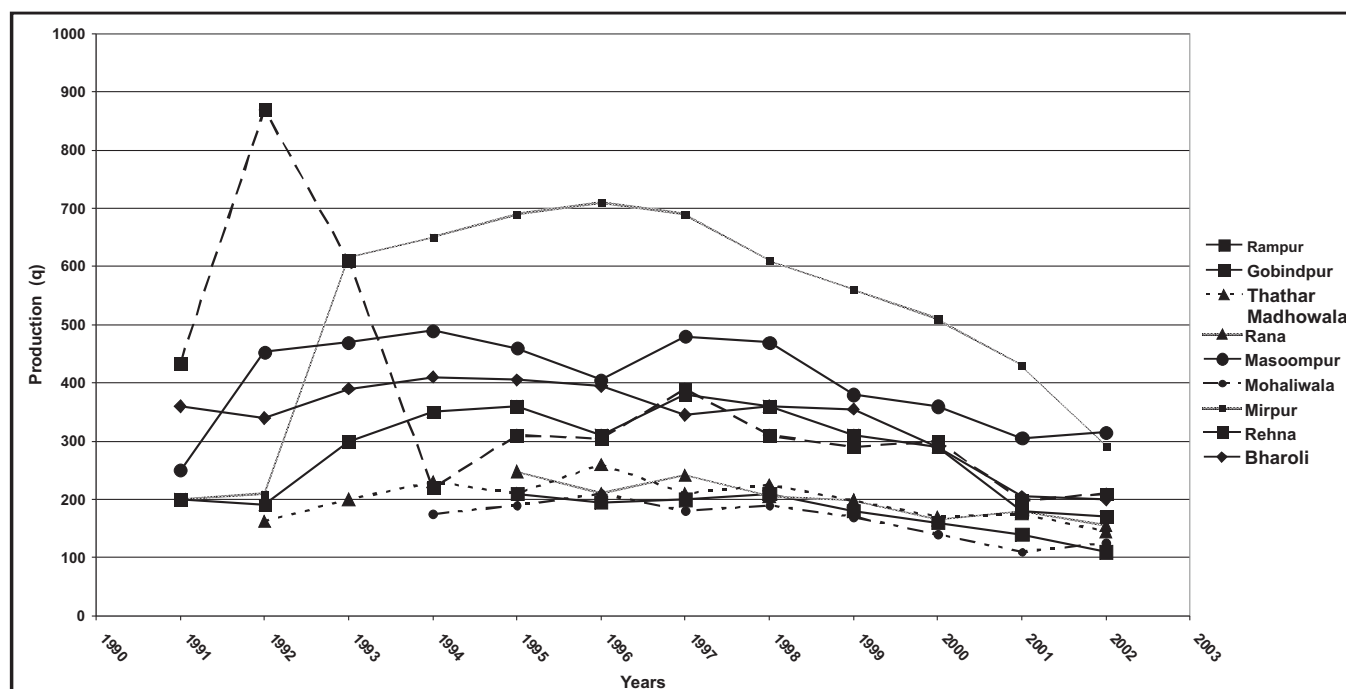


Fig. 3. Production of *bhabbar* grass in Raipur Rani range (1 quintal =100 kg)

4. CONCLUSIONS

The results presented under the study have revealed that participatory action involving the government and local communities has played a considerable role in regeneration of degraded forests through effective protection and improving the socio-economic condition of these communities in Haryana state. The production and productivity indicators both from forest and agricultural land further demonstrates that striking successes have been achieved in some of the villages. With the increase in crop yields, there was an increase in agricultural residues like wheat straw, corn stalks, etc., which reduced their dependence on fodder from the forest. Exciting beginning was made in JFM in a number of ways. Low-cost lease rates offered communities opportunities for substantial profits. However the profits were restricted to *bhabbar* and forage grasses only. Nothing was done in practice regarding sharing of rights for the trees planted in the watersheds. Further, under the revised resolution of 1998, monetary share/net profit to local institutions reduced drastically because the ultimate procedures are greatly influenced by state and related departments' decisions.

Even with the conducive environment for community involvement in the management of forests, number of problems arises in making the institutional arrangement sustainable. Deserving of mention are: (1) absence of legal rights for communities, subjecting them to the approval of departments (2) large share of benefits being appropriated by the forest departments. Substantial power still vests with Forest Departments to suspend and dissolve JFM committees. Undoubtedly, JFM has the potential to generate

diversified livelihood in rural communities and local empowerment as well as improved management through local participation. It is thus imperative that the interests of the Forest Department and JFM committees should converge for sustainable resource management.

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