

## **Management of Forest Fire Through Local Communities: a Study in the Bolangir, Deogarh and Sundergarh Districts of Orissa, India**

By Pritam Kumar Nanda and Pravat Chandro Sutar; October 2001

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### **EXECUTIVE SUMMARY**

In the state of Orissa, India, the vast rural population is very dependent on forests. A substantial part of the livelihoods of these forest-dependent people is obtained from the trade of non-timber forest products (NTFPs). From a commercial viewpoint, the two most important NTFPs are mahua (*Madhuca indica*) flowers and kendu (*Diospyros melanoxylon*) leaves. The flowers of mahua are rich in carbohydrates and form the substrate for locally brewed liquor. The new, regenerated leaves of kendu are used in the *bidi* industry. It is well known that fire is used in forest areas to initiate the coppicing of kendu plants and to facilitate the collection of mahua flowers.

Unfortunately – and incorrectly – these activities are among the reasons commonly given for forest fires, pointing to the forest-dependent people as the root causes of such fires. What escapes attention, however, is the poverty that these people live in.

This research on community-based fire management (CBFiM) was undertaken in the belief that forest-dependent communities would be sufficiently interested to protect forests and prevent or manage forest fires, owing to the importance of forests to their livelihoods. Cases were studied in the districts of Bolangir, Deogarh and Sambalpur in the state of Orissa. These districts have one of the highest forest covers in the state, and hence a significant proportion of their rural population is dependent on the forest for its subsistence, as well as for much-needed income. In order to generate a full picture of the dynamics involved, elaborate discussions were held with the forest dwellers, grassroots-level workers in a local non-governmental organization (NGO) working in the area and Forest Department officials at all the three sites. At village-level meetings, it was ensured that there was maximum representation of women and village elders.

During the course of the study, it was found that most forest protection initiatives emerged only after the dependent community had started to feel the scarcity of resources. The frequency of occurrence and the management of forest fires seem to be closely correlated to the level of dependency that a community living in close proximity to the forest has over the forest. It was seen that the people at two of the three sites studied were taking a proactive interest in the management of forests. Given that the state Forest Department lacks infrastructure and has poor budgetary allocations, it would be useful to encourage community-based initiatives as the most feasible mode to manage forest fires.

## **Gestion des Incendies de Forêt par les Communautés Locales: Etude Effectuée dans les Districts de Bolangir, Deogarh et Sundergarh de L'état D'orissa, Inde**

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### **RÉSUMÉS**

Dans l'État d'Orissa (Inde), la population rurale, qui est fort nombreuse, tire une bonne part de sa subsistance des forêts, notamment du commerce de produits forestiers non ligneux. Du point de vue commercial, les deux produits de ce genre les plus importants sont les fleurs de mahua (*Madhuca indica*) et les feuilles de kendu (*Diospyros melanoxylon*). Les fleurs de mahua sont riches en hydrates de carbone et servent de base à la production locale de liqueur, tandis que les jeunes feuilles de kendu sont utilisées pour la fabrication de cigarettes *bidi*. Tout le monde sait que le feu est utilisé dans les zones boisées pour créer des taillis de kendu et faciliter le ramassage des fleurs de mahua.

Malheureusement, ces activités figurent – à tort – parmi les causes des incendies de forêt évoquées habituellement de sorte que les populations qui vivent de la forêt sont considérées comme étant à l'origine de ces incendies. Toutefois, ce qui est passé sous silence, c'est la pauvreté dans laquelle vivent ces populations.

Cette recherche sur la gestion communautaire des incendies de forêt a été entreprise parce que l'on pensait que les communautés tributaires des forêts seraient disposées à protéger ces dernières et à prévenir ou gérer les incendies en raison de l'importance des forêts pour leur survie. Des études de cas ont été effectuées dans les districts de Bolangir, Deogarh et Sambalpur (État d'Orissa). En effet, ces districts ont un des pourcentages de terres boisées les plus élevés de l'État, de sorte qu'une proportion non négligeable des populations rurales tire des forêts sa subsistance ainsi que des revenus dont elle a le plus grand besoin. Afin d'avoir une vue complète de la situation, des entretiens approfondis ont eu lieu avec les habitants des forêts, les agents de terrain d'une organisation non gouvernementale locale qui travaille dans la zone et des fonctionnaires du Département des forêts sur les trois sites. On a veillé à ce que les femmes et les anciens soient représentés le plus largement possible aux réunions au niveau des villages.

Au cours de l'étude, on a constaté que des mesures de protection des forêts ne sont généralement mises en place que lorsque la communauté intéressée commence à ressentir les effets de la pénurie de ressources. La fréquence des incendies de forêt et leur gestion semblent étroitement liées à la mesure dans laquelle une communauté habitant à proximité d'une forêt en tire sa subsistance. Il est apparu que les populations de deux des trois sites étudiés portaient un intérêt actif à la gestion des forêts. Étant donné que le Département des forêts de l'État manque d'infrastructures et ne dispose que de crédits budgétaires limités, il serait souhaitable d'encourager les initiatives à base communautaire car elles constituent le moyen le plus pratique de gérer les incendies de forêt.

## **Manejo de los Incendios Forestales a Través de las Comunidades Locales: un Estudio Realizado en los Distritos de Bolangir, Deogarh y Sundergarh de Orissa, India**

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### **RESUMEN DE ORIENTACION**

En el estado de Orissa, India, la población rural es muy numerosa y depende, en gran medida, de los bosques. Una parte importante de los medios de subsistencia de esta población proviene del comercio de productos forestales no madereros (PFNM). Desde un punto de vista comercial, los dos productos forestales no madereros más importantes son las flores de mahua (*Madhuca indica*) y de kendu (*Diospyros melanoxylon*). Las flores de mahua son ricas en carbohidratos y forman parte de la preparación de una bebida alcohólica local. Las hojas de kendu regeneradas, forman parte de la industria del *bidi*. Es ampliamente reconocido que en estas áreas boscosas el fuego es utilizado para obtener rebrotes de cepa y generar más plantas de kendu, así como para facilitar la recolección de las flores de mahua.

Desafortunada – y erróneamente – estas actividades forman parte de las causas mencionadas a menudo como responsables de los incendios forestales, señalando así a la población que depende de los bosques, como la causa de dichos incendios. Sin embargo, se hace caso omiso de la pobreza en la cual vive dicha población.

Esta investigación sobre el manejo comunitario de incendios forestales fue realizada con la convicción de que las comunidades que dependen de los bosques, tendrían suficiente interés en protegerlos y prevenir, o manejar, los incendios forestales debido a la importancia que los bosques tienen para su subsistencia. Se estudiaron los casos de los distritos de Bolangir, Deogarh y Sambalpur en el estado de Orissa. Estos distritos tienen una de las cubiertas forestales más densas del estado, y por lo tanto una proporción considerable de su población rural depende de los bosques para su subsistencia, así como para la generación de los ingresos que tanto necesitan. Con el fin de proporcionar un panorama completo de las dinámicas que actúan en este marco, se llevaron a cabo debates exhaustivos con los habitantes de los bosques, los trabajadores de campo de una organización no gubernamental local que trabaja en el área, así como con los funcionarios del Departamento Forestal en los tres sitios. En las reuniones realizadas en el ámbito de la aldea, se aseguró que existiera el mayor grado de representatividad de las mujeres y ancianos.

En el curso del estudio, se hizo evidente que la mayoría de las actividades de protección de los bosques, surgían a medida que la comunidad dependiente comenzaba a percibir la disminución de los recursos. La frecuencia con que ocurren y se manejan los incendios forestales parece estar íntimamente ligada al grado de dependencia forestal que tiene una comunidad que vive cerca de los bosques. Además, se verificó que la población de dos de los tres sitios estudiados, estaba tomando un activo interés en el manejo de los bosques. Dado que el Departamento Forestal carece de infraestructura y tiene escasos recursos presupuestarios, sería útil fomentar las actividades comunitarias como el medio más factible para manejar los recursos forestales.

## INTRODUCTION

Forest fires sometimes cause widespread destruction to the flora and fauna of forest ecosystems. The restoration time needed by some forested ecosystems ravaged by fire can be very long. Because of their livelihood interests, it is believed that forest-dependent communities would be sufficiently interested to protect the forest and, thus, to prevent the occurrence of forest fires. It was with such a motive that a study was initiated by Vasundara<sup>1</sup> and FAO to explore the rationale for using fire to enhance the production of kendu leaves in India; the collection of other NTFPs; the economics of such interventions; and their environmental impacts. A pattern emerged showing a distinct correlation among the community's dependency on the forest, the abundance or lack of forest resources and the level of interest that the community has in taking steps towards fire prevention and mitigation. The role of the state Forest Department (FD) and the facilitation of CBFiM were also explored.



The accumulation of leaf litter over the years helped the fire to reach heights of 23 feet at place. Note the burn and charring in the hollow of the tree.  
Photograph taken at Badatoila Reserve Forest, Deogarh.

Varying emphasis has been placed on identifying indigenous practices for using fire as a management tool. In this part of India, common uses of forest fires are to:

- initiate coppicing of kendu (*Diosporus melanoxylon*);
- facilitate the collection of mahua (*Madhuca indica*) flowers;
- encourage a good growth of grass for fodder; and
- keep wild animals away from human habitation, for safety and for the hunting ritual.<sup>2</sup>

These uses point to forest-dependent people and their activities as the most likely cause of the

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<sup>1</sup> Vasandra is an NGO involved in the forestry sector in Orissa. Its aims are to improve community–state collaboration and facilitate policy changes towards community-based forest management systems.

<sup>2</sup> This ritual is still carried out in the districts of Keonjhar and Mayurbhanj in the state of Orissa.

forest fires. However, the poverty that these people live in drives them to carry out such activities. The first three activities are carried out to derive some subsistence income. The frequency of occurrence and the management of forest fires seem to have a close correlation with the level of dependency that a community living close to the forest has on the forest.

The state allocates meagre resources to the management of forest fires, and these resources remain at the disposal of the FD. The lackadaisical attitude of its field staff, coupled with the desperation of forest-dependent communities seeking an immediate source of livelihood and easy methods for forest product collection, create a volatile environment in which fire often becomes an uncontrolled phenomenon. In many areas, a guard has to patrol an area of about 150 to 200 ha. Controlling forest fires over such large areas without the active cooperation of communities is a massive task.

It would be almost impossible for the FD to stop the occurrence of forest fires by policing the area. It has been alleged that the root cause of forest fires is the misuse of fire by forest-dependent people. They use fire for two main purposes: to initiate regeneration of kendu leaf shoots and to facilitate the collection of mahua flowers. The new kendu leaves promoted by fire are harvested for the *bidi*<sup>3</sup> industry. Fire is also used to clear the ground of leaf litter to help facilitate the collection of mahua flowers, which have a ready market as the sole raw material for a locally brewed liquor. For the rural people, especially among the tribal population, both products form important parts of their diet, as well as being income-generating activities.

## METHODOLOGY

For this study on community initiatives to manage forest fires, three sites in the districts of Bolangir, Deogarh and Sundergarh in the state of Orissa were selected (see map of Orissa showing these field sites) after consultations with the FD and NGOs working in these areas. The priority was to select areas showing high kendu leaf and mahua collection, and dependency of the poor people living in and around the forests on these NTFPs. Group and key informant interviews and meetings were held with forest protection communities at the village level and with the Divisional Forest Officers, Range Officers and other field-level staff of the state FD.

### The prevalent policy framework

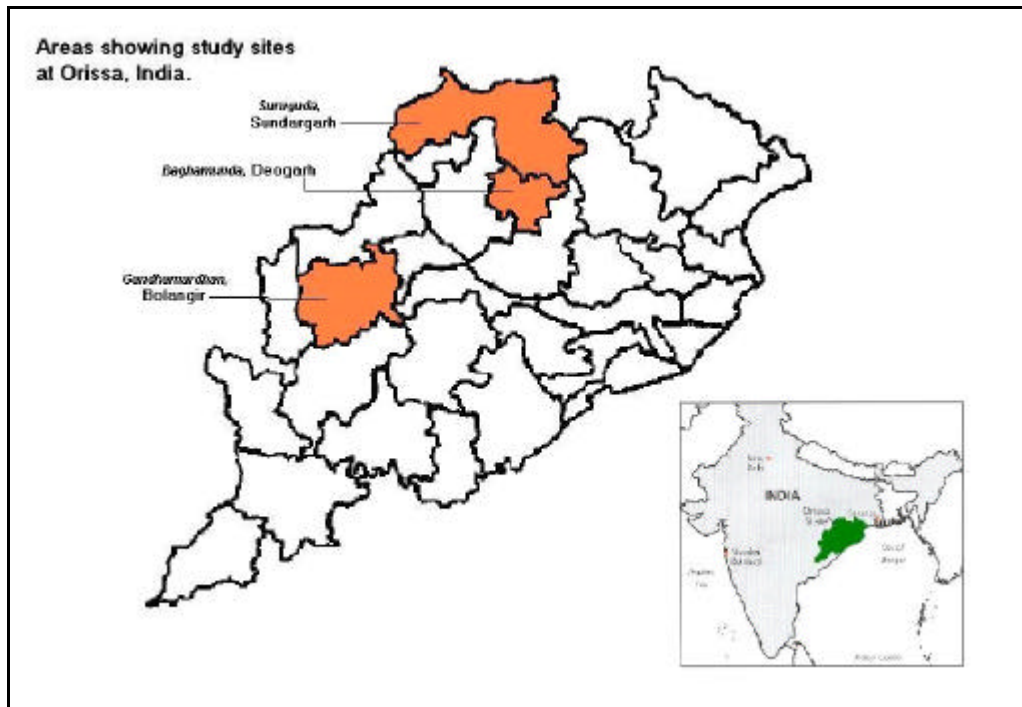
In reference to the reserve forests, the Orissa Forest Act<sup>4</sup> (1972), under section 27(1) (b) and (c), states: "... kindles any fire in such forests or leaves any fire burning in such manner as to endanger such forest or forest land; or in a reserved forest kindles, keeps or carries any fire except at such reason as the Forest Officer may notify in this behalf, shall be punishable with imprisonment for a term which may extend to six months [and with fine] which may extend to 500 rupees (Rs)". The Indian Forest Act (1927) prescribes the same for such offences in reserve forests.

The same Act, under section 27(3) (a) states that any person in a reserve forest who: "... lops or burns any tree ... shall be punishable with imprisonment with a term which may extend to two years [and with fine] which may extend to Rs 5 000".

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<sup>3</sup> Hand-rolled cigarettes made of kendu leaves and tobacco.

<sup>4</sup> The Act governing the state's forests.



The Orissa Forest (Amendment) Act 2000 is stricter than the earlier Act. The amendments that were brought in last year were:

1. For offences made under Section 27(1) the term of imprisonment was extended to up to one year and the amount that could be fined was raised to Rs 1 000.
2. For offences made under section 27(3) the term of imprisonment was extended to up to three years and the amount that could be fined was raised to Rs 10 000.

In spite of these provisions, the FD's failure to enforce them means that there are no tangible changes in the situation.

### **SITE 1 – BOLANGIR**

The district of Bolangir is towards the western part of the state of Orissa. Approximately 23.5 percent of its area (1543.85 km<sup>2</sup>) is under forest cover (Statistical Office, 1999). Within this district, a site was selected for studying community initiatives for forest fire management in the Gandhamsardhan hills, which stretch for 96 km. The site of the study, Harishankar, is an important place of worship for the Hindus. Adjoining this site is the village of Nandupalla. Human interventions are marked, take place all year round and, at times, assume gargantuan proportions. Pilgrims undertake overnight journeys to get to the site, travelling from all over Orissa and the neighbouring state of Madhya Pradesh. They are part of a floating population and stay at the site for a day or two. Even though the site is inside a reserve forest area, the pilgrims start wood fires and cook meals. Although voluntary organizations try to ensure that fires are kept to a minimum and are properly looked after, there have been cases where fires have been abandoned without being put out.

### **The KL story**

At the village meeting at Harishankar, locals readily agreed that KL was being collected from areas on the slopes of Gandhamardhan where bush cutting operations were taking place, even though bush cutting operations are not supposed to be undertaken there. They also agreed that regeneration of the new KL shoot was the result of a fire that had occurred. The difficulties in carrying out bush cutting operations on hilly slopes are known to all, so it is obvious that a section of society in this area resorts to using fire in order to initiate coppicing of the kendu plants. “All it requires is just a match,” said Mr Palasagar Bhoi, the President of GSAC.

A group of 30 villages, based in the foothills of the Gandhamardhan hills, have come together to form the Gandhamardhan Suraksha<sup>5</sup> Action Committee (GSAC). This committee does not owe its existence to any conscious forest management initiative, but to the amalgamation of efforts to protest against the leasing of the Gandhamardhan hills for mining<sup>6</sup> activities. Forest fires are a frequent phenomenon in the Harishankar area: “Patches of forest are under fire every year and this year it had spread up to the wall of the temple.” (Mr Prasana Pujari, Treasurer GSAC)

Forest protection measures have been undertaken since 1980, but GSAC was not formally registered<sup>7</sup> until March 2001. Prior to 1980, forest protection measures existed but there were no formal or written rules. Voluntary actions had been the mainstay of all forest management efforts, including mitigation and awareness generation activities, and it was said that the annual occurrence of forest fires is as habitual a phenomenon as the change of seasons. These are human-caused fires, as was revealed during the meetings at Nandupala: the villagers do not remember fire ever occurring as a result of natural phenomena such as lightning. Even after GSAC enacted the forest protection rules, there was no sign of a decline in the frequency of fires. Almost all protection initiatives have been directed at thwarting the efforts of the mining companies. The people have never given much consideration to the long-term detrimental effects of forest fire, and thus continue to use it to meet their daily needs.

The fire in 2001 came during mid-February, coinciding with the bush cutting activities that are undertaken in the Gandhamardhan hills. The kendu leaf (KL) division of the state FD does not carry out bush cutting on these slopes, in spite of the abundance of kendu plants. The explanation for this varies from source to source: local people claim that it is because the money allocated to bush cutting is “misappropriated” by FD staff, while the FD claim that the money “is just not enough”. This is surprising because Bolangir is one of the highest KL producing districts in the state and the economically undeveloped area of the district is highly dependent on the KL trade. For landless people, KL contributes between 66 and 78 percent of their total annual income (Vasundhara, 1998), and since Bolangir district has suffered from drought, the rural population’s dependency on the resource has increased greatly. According to state government figures, crop losses in 2001 were between 60 and 70 percent in and around the Gandhamardhan area. Because the forest provides a source of income to a portion of the population, the rate of migration from these areas to the cities has decreased.

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<sup>5</sup> *Suraksha* means “protection” in Oriya, the local language of Orissa.

<sup>6</sup> In 1980, BALCO, a Government of India enterprise, was given lease for Bauxite mining activities. This attempt to lease out the forest area in the Bolangir Forest Division was thwarted by a mass movement of the people living close to the range who are partially, or wholly, dependent on the forest for their livelihood needs.

<sup>7</sup> Under the Societies Registration Act (1860) of the Government of India.

Fires in the Gandhamardhan area are mostly of a smouldering or creeping nature. As surface fires occur annually, there is only limited accumulation of the leaf litter layer and the resulting substrata is too shallow to provoke high flames. The villagers have a nonchalant attitude toward fires, never finding them “menacing or threatening to their lives and property”. The nearest human habitation is at least 1 to 1.5 km away from the foothills, separated from them by agricultural fields.

### **The livelihood perspective**

KL is the mainstay of the landless people, providing employment and cash during the torrid summer, which is the lean agricultural period. The other major NTFP contributing to rural people’s livelihoods is mahua, whose flowers – especially the fleshy petals – are rich in carbohydrates and form an important part of the diet of tribal people. *Mahua* is also used for brewing a local drink that has a ready market. Trade in KL and mahua makes the difference between a family starving and having two meals a day during the lean agricultural period.

In spite of yearly fires in the Gandhamardhan area, the forest-dependent people do not find any marked reduction in the availability of forest products. They were of the opinion that, although the population residing in the foothills does not depend completely on the forest, almost every community has some kind of dependency on the forest. There have been no disputes or conflicts among the members of the communities over unequal sharing of the resources. Mr Ganga Sethi, who has collected medicinal plants as his source of livelihood for 23 years, says that he still finds optimum quantities of medicinal plants in the area. The forest fires that occur every year do not seem to have had a marked effect on the availability of medicinal plants. Villagers were unanimous in replying that they did not find any remarkable change to the landscape in terms of loss of tree cover. Fire may therefore not be as devastating as is generally thought.

#### **The Mahua story**

It is difficult to pick the mahua flowers that fall on the forest floor daily. The normal practice of forest-dependent communities is to ignite the litter under the canopy of a tree in a circular manner. When the mature flowers drop on the ash they can easily be collected. “This is probably the only method of collection through which people can collect a substantial amount of mahua flowers, but it is never the best managed one,” said Mr B.B. Patel, the Assistant Conservator of Forests in Deogarh Forest Division. People rarely take safety precautions in controlling the fire, which invariably spreads owing to the availability of leaf litter substrate.

### **The role of the Forest Department**

As is the case throughout Orissa, in Bolangir the FD plays a minimal role in the mitigation of forest fires. This is owing to the lack of infrastructure and budget resources: an average of Rs 1 500 to Rs 2 000 per annum is allocated to each forest range for meeting fire mitigation expenses.

### **Conclusion for Bolangir**

The ample availability of forest resources is the main reason for the lack of conflict within the



dependent groups that share those resources. With regard to initiatives for forest fire management, there is an apathetic attitude among community members who believe that, because fires occur every year, there is nothing that they can or should do about them. This was demonstrated by the fact that the fire of 2001 burnt for 72 hours and crept up to the boundary of the temple without the people of the villages or the members of GSAC taking any steps to mitigate it.

Although awareness-raising activities regarding forest fires and general forest management principles are common, forest fires still occur every year. In a few isolated cases, youth organizations, encouraged by various NGOs, are starting to disseminate information and are trying to create awareness among the forest-dependent people of the area. Owing to the low level of dependency on the forest, with a large section of the population being agriculturists, interest in protecting the forest from fires will grow only if local people perceive a tangible loss of resources and a marked depletion of the forest cover over the years.

## **SITE 2 – DEOGARH**

The district of Deogarh lies towards the north-central part of the state. Deogarh Forest Division (DFD) is a relatively recent state administrative demarcation; its total forest area is 3 484.01 km<sup>2</sup>.

“Forest fires are a regular and annual phenomenon which cause damage to at least 40 to 60 percent of the cover whenever they occur,” (Mr B.B. Patel, Assistant Conservator of Forest, DFD)

The site of the study, Badatoila Reserve Forest, is surrounded by 11 villages, which are highly dependent on the forest. Together with rainfed agriculture, NTFPs augment the livelihoods of the people in the region and tide them over during the non-agricultural periods.

### **The site**

Although 11 villages depend on this 200-ha reserve forest, it has been protected by the people of Baghamunda village. A women’s self-help group, Arnapura Mahila Samiti, has taken the lead and plays a very active role in protecting the forest. Although the villagers themselves tried to ensure the well-being of the forest, formal protection was deemed necessary in 1988: “We felt the resource base was reducing. To obtain basic necessities like fuelwood, we had to wander about for long periods in this degraded forest, hence wasting a lot of time. This prompted us, and apart from initiating other economy-enhancing activities, forest protection measures were also taken up by our group. This was done with the complete cooperation and active support of our menfolk.” (Ms Sumitra Pradhan, President, Arnapura Mahila Samiti)

### **Funds and fire**

There is a relationship between the amount of funds flowing in every year and the size of the forest patch that is ignited. The larger the area under fire, the greater the support that is solicited from villagers, and the higher the allocation of funds for fire mitigation activities. This information leaks out to the people. The DFO was therefore of the opinion that it is a good sign not to have a large flow of funds into the division.

In all forest management activities, the committee has received the whole-hearted support of the other villagers of Baghamunda. The group has not made any clear-cut rules for the mitigation of

forest fires, and has not even considered doing so. Over the past ten years, there has been no incidence of fire in the area that the group protected. Forest protection initiatives have ensured at least two tangible and very visible benefits: the yearly supply of fuelwood has been ensured; and the villagers earn enough from their yields of mahua to tide them over the non-agricultural season. They do not have to migrate to other areas and work as labourers at construction sites.

According to Division Forest Officer (DFO), Mr Omprakash Singh, the FD has created very few firebreaks because of inadequate budget allocations. With an annual allocation of about Rs 10 000 (about US\$210) for forest fire management across the entire division, the FD cannot be expected to establish any major initiative. The DFO added that a large portion of these meagre funds goes to the villagers as payment for their labour in fire mitigation activities.

The constant limitations on resources in the state FD have led to a lack of field personnel, which in turn results in poor policing and law enforcement. The best option for the FD is to solicit the community's active support, but conflict over the sharing of resources has divided the communities, both externally and internally: "For the first time in ten years of forest protection activities, the forest was on fire this year ... and within 12 hours over 50 to 60 percent of the area that we had been protecting had burnt." (Ms Tava Naik, Secretary of Arnapura Mahila Samiti)

The villagers of Baghamunda allege that this was the act of members of a non-protecting village, in retaliation for not being allowed to collect timber and NTFPs from the area. On the day of the fire, all of Baghamunda was involved in two marriages that were being solemnized. By the time that people were aware of the fire, it had already spread over a large area. The adults of the village rushed to create a firebreak, using raw branches to douse the flames. The flames were almost 1 m high where there was leaf litter. The women of the village remarked that, owing to the fire, there would be a great dearth of fuelwood and a scarcity of mushrooms (an important part of their diet) during the monsoons. The villages in and around the Badatoila Reserve Forest depend completely on the forest for their annual supply of fuelwood.

#### **Fuelwood – a basic necessity**

Until 1998, each household extracted an average of 40 cart loads of fuelwood per annum. Since the FD held meetings at the village level, with the help of representatives from Orissa Jungle Mancha, the level of extraction now stands at an average of 12 cart loads. (180 to 200 kg of wood) per household per annum.

This fire resulted from a conflict that had been brewing for more than two and a half years. When asked about the cause of the fire, members of the village stated that they had seen the benefits that the villagers of Baghamunda were deriving from their forest protection initiatives and wanted to demarcate a portion of the protected forest for their own use, but the villagers of Baghamunda would not agree to this. They argued: "Years ago when cooperation was sought from all the neighbouring villages, no one turned up. Now that the forest has started yielding resources, everybody wants a share of it". The Baghamunda forest protection committee's refusal of the neighbouring village's request prompted retaliation.

### The livelihood aspect

Kendu leaf and mahua are the two species that contribute the most to villagers' livelihoods. Constant vigilance by the people of Baghamunda and voluntary adherence to the forest management rules of the self-help group (SHG) have ensured that there were no fires in the forest for ten years. Although the people of Baghamunda and neighbouring villages are involved in the collection of KL and mahua flowers they do not use fire to augment yields. While gathering mahua flowers, the collectors use fire sparingly to burn the leaf litter under the mahua tree. They take great care that the fire does not spread, by first clearing the surrounding area or by gathering the leaves into a single pile and burning them. An FD staff member was caught by the members of a neighbouring village while abating the use of fire to initiate regeneration for KL production. A Public Interest Litigation against the staff member is still pending in court. (This information was gathered during discussions in the village and with the DFO of Deogarh.)



A board put up by the Deogarh Forest Division at a tourist spot with the following verse: "There is no rain without forest; there is no life without rain; when our huts burn, we flee to the forest. When the forests burn, where do we flee to?"

Local people also use the forest to meet other needs. Mahua flower collection and the regeneration of KL are not the only human activities that expose the forest to the dangers of fire. Some people use wood ash from the *Asàn* (*Terminalia tomentosa*) tree to clean clothes, by boiling the ash together with the clothes. Most of these people are members of the washer community, and use very large quantities of ash. Members of the blacksmith and goldsmith communities are similarly dependent on wood charcoal for their professions. These three communities prepare the ash and charcoal within the forest and smuggle it out because it is illegal to cut trees in that forest area. Fires related to these activities tend to be left unattended and often spread.

The Orissa Forest Act (1972) forbids any kind of human activity inside the reserve forest, but a brick kiln was found at the study site in this area. During discussions with the forest protection group and villagers, they admitted that they needed the kiln to meet the local infrastructure needs of their village. At first, they were blamed for carrying out an illegal activity in a reserve forest area and for increasing the threat of forest fires in the surrounding area. However, closer investigation revealed that precautions were taken. Villagers had made sure that the area surrounding the kiln was clear of any substrata, and that throughout the firing process the area was kept under surveillance to ensure that the fire had no chance of spreading. In addition, the bricks were used to repair houses, so the villagers were making them to meet a local and basic need rather than for commercial purposes.

This example illustrates how community awareness can give rise to mechanisms in which fire is used in a carefully managed way. The Baghamunda village members have a heightened level of awareness and interest in managing the forest on which they depend. Both the FD officials and the villagers agreed that human interaction with nature is the root cause of forest fires. Both parties also agree that CBFiM is the most logical and easily implemented system to prevent and mitigate forest fires.

### **SITE 3 – SUNDERGARH**

The district of Sundergarh lies in the northwestern part of the state. It has 4 087 km<sup>2</sup> of forest cover, one of the highest levels among all the districts in the state of Orissa (Forest Survey of India, 2000). Being a predominantly tribal district, the level of forest dependency is high.

#### **The site**

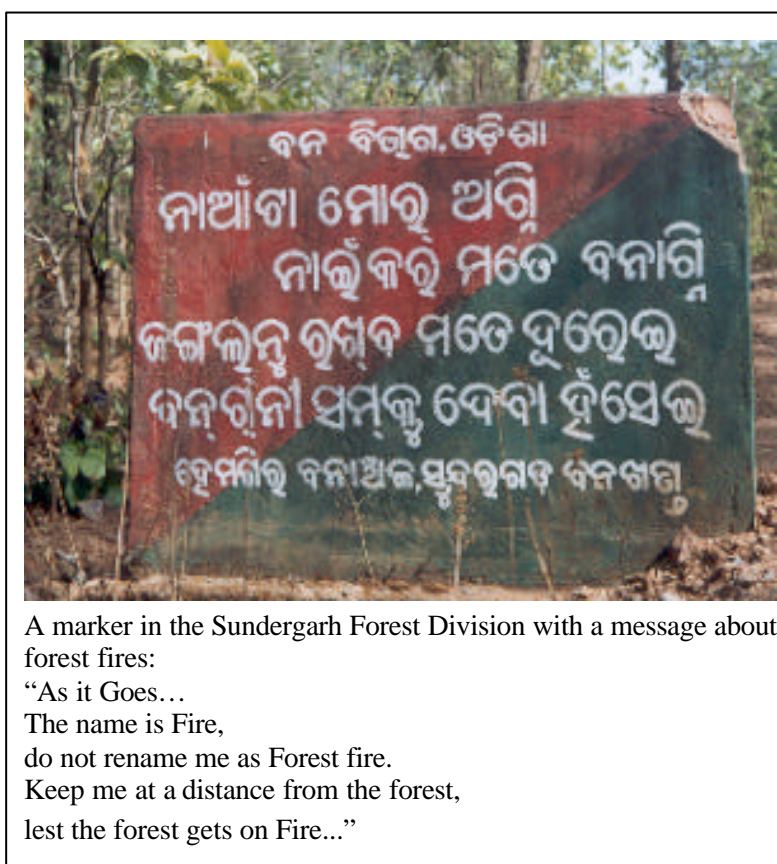
The site selected in this district is in the Bindhapahad Reserve Forest area, which has been protected by a village-level forest protection committee called Suruguda Vana Samrakhyana Samiti<sup>8</sup> (Suruguda VSS). Informal protection started here in 1984/1985. The shortage of fuelwood and timber to meet the needs of local villagers had prompted the establishment of a forest protection group. In 1994, the state FD entered into a joint forest management (JFM) arrangement with the forest protection committee. Currently, this group has 120 general body members from Suruguda village and Millupada. As in other districts of Orissa, trade of KL and mahua is a major source of livelihood for the landless majority in Sundergarh and the landless and those with marginal holdings in Suruguda village depend on these two NTFPs for subsistence earnings during the lean agricultural season. The population of the area is not solely dependent on forest products, because a large number of people own agricultural land.

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<sup>8</sup> This can be translated as “Suruguda Forest Protection Committee”.

### Fires in the region

Inter-village conflicts are sometimes the root cause of forest fires. The last destructive fire occurred in 1999, when a group of people from another village started a fire that raged for days while nobody volunteered to extinguish it. This was in retaliation for the failure of executive body members of Suruguda VSS to fulfil promises made to volunteers during the previous year's annual cleaning operations.<sup>9</sup> The volunteers alleged that they were not compensated for their services, and said they were not willing to put in labour for any activity that was related to the forest because they were not deriving any tangible benefits.



In contrast, when a woman was caught lighting the litter under a mahua tree in the protected area, she was fined Rs 500 (about US\$12) – a hefty sum for a forest-dependent person. She was also ordered to make a public apology to the villagers. Such severe punishment has had constructive effects and forest fires were almost non-existent in 2001. Only a small patch of forest was affected by fire, which was quickly extinguished by a patrol group of the forest protection committee.

<sup>9</sup> Under the JFM agreement, periodic cleaning of forest areas is undertaken and forest products are shared equally among the members of the protecting group.

Of all three sites studied, this one showed the lowest level of forest fires, primarily owing to early mitigation. At Suruguda, the cooperation of the village-level forest protection committee and its village members contributed to the successful implementation of a protection system.

## **CONCLUSIONS AND SUGGESTIONS**

This study takes into account the opinions of the forest-dependent community (as both managers and end users) and of the state FD, which has to enforce many antiquated laws (some of which were formulated during the period of United Kingdom colonization of India). From a socio-economic perspective, the important dimensions that were considered were the links between the frequency of forest fires and:

- 1) the availability of resources;
- 2) the degree of forest-dependency of the people; and
- 3) the use of fire for various livelihood-generating activities.

There are myriad causes of forest fires in the state of Orissa. The most common are those related to the livelihoods of the forest-dependent people. Local people and the FD agree that fire is used in numerous places and under varying circumstances, and that some fires get out of control. In areas where there is the potential for KL collection, but the KL wing of the FD does not initiate bush-cutting activities, the people collect KL for their own livelihoods. Setting fire to the litter on the forest floor seems to be the most economical method (both financially and in terms of labour) to initiate the regeneration of new leaves.

FD officials agree that there are no alternative methods for the collection of mahua flowers. As the tiny brown petals fall on to the forest floor, it is difficult for collectors to find and gather them from under the dried leaves. The use of fire seems to be a dangerous practice but, in areas where people are aware and take precautions, it is very prevalent and there are no instances of uncontrolled forest fires. Forest-dependent people also need to address their infrastructure needs. The example of the brick kiln inside the Badatoila Reserve Forest in the Deogarh Forest Division demonstrates an awareness of fire management issues. This activity was illegal, but the precautions taken indicate that the community has the knowledge and capacity to keep fire in check. Alternatively, at the site at Gandhamardhan (in Bolangir district), where people are aware of the destructive nature of forest fires, most forest protection initiatives are related to mining activities. Fires occur there every year and are considered to be natural phenomena (even though they are started by humans).

In general, stiff retribution by the forest protection committee at the village level and in front of the village seems to be a good strategy. The formulation of rules and decisions about the nature and extent of punishment should be the responsibility of committee members in conjunction with the villagers. This process promotes compliance, or at least awareness of all the sanctions and how they are formulated. The risk of being prosecuted in public would surely act as a deterrent to future offenders.

The outbreak and frequency of forest fires are dependent on the interests and level of forest dependence of the rural community living close to the forest area. Forest protection measures are adopted only when communities experience scarcity of forest resources and realize the magnitude of the impending disaster. This explains why forest protection activities were taken up

passionately by the communities at Baghamunda<sup>10</sup> and Suruguda.<sup>11</sup> At the site in Bolangir, only a few people are highly dependent on the forest because much of the population is agrarian in nature. Even though there are strong signals of resource depletion, the forest range can still provide ample material for the needs of the 30 villages located in the foothills. The GSAC people's organization cares for the forest by opposing mining activities, but it has not yet turned its attention to the regular occurrences of forest fire, and does no more than disseminate information regarding its destructive effects. The FD has also made efforts to raise awareness of the dangers of fire. At a couple of sites where people gather, the FD has put up information about the effects of forest fires.

Owing to the lack of infrastructure and poor budgetary allocations, the state FD cannot do much by itself to manage forest fires. In general, forest-dependent people take an active interest in forest management, and it has been shown that their community-based initiatives are the best way to manage forest fires. Past experience shows that valuable flora and fauna cannot be protected by a few forest officials, even if those officials are well equipped (with arms, ammunition, the required number of vehicles, etc.) and empowered to conduct searches and arrest offenders. People's participation in the protection of forest and wildlife may have the desired effect (Statistical Branch, 1999). With this in mind, strategies could be developed for:

- imparting basic knowledge on forest fires;
- creating awareness about the pros and cons of forest fires, for both immediate and long-term benefits; and
- training in methods of forest fire control and management.

Special attention should be paid to the way forest protection committee meetings are initiated and held. At least one adult member from each household should be present at the meetings to participate in the discussion, but at present only management committee members attend meetings. The meetings should be held at the start of the torrid summer months, as it is during these months that forest fires are most frequent.

In India, it is alleged that forest-dependent communities are the root cause of forest fires and that they use fire in order to derive immediate gains. However, these are also the people who, over the generations, have developed indigenous and instinctive ways of managing forest fires. Their knowledge should form an important part of management principles. The entire activity should aim at building rapport with the FD in the state, so that villagers and FD personnel can work together. The active involvement of local people in CBFiM would assist the perpetually resource-starved FD to manage fire collectively in a large area, when conventional suppression mechanisms are failing.

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<sup>10</sup> The site in Deogarh district.

<sup>11</sup> The site in Sundergarh district.

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## REFERENCES

- Chaturvedi, A.N.** 1999. Forest notes and observation – forest fires. *Indian Forester*, December 1999: 1271–1273.
- Das, N.K.** (ed.) 2000. *Orissa Forest Manual*. Orissa, India, Orissa Law Review.
- Forest Survey of India.** 2000. *State of forest report 2000*. Dehradun, India, Ministry of Environment and Forest.
- Goodman, J.F. & Rufelds, C.H.** 1996. Forest fire management in ASEAN through regional cooperation. Paper for the AIFM Conference on Transboundary Pollution and Sustainability of Tropical Forests: Towards Wise Forest Fire Management, 2–4 December 1996, Kuala Lumpur, Malaysia. Canadian International Development Agency.
- Srivastava, R.K., Chidambaram, K & Kumaravelu, G.** 1999. Impact of forest fire and biotic interference on the bio-diversity of eastern Ghats. *Indian Forester*, May 1999: 439–443.
- Statistical Branch.** 1999. *Orissa Forest*. Orissa, India, Office of the Principal Chief Conservator of Forests.
- Vasundhara.** 1998. *NTFP and rural livelihood*. Orissa, India.
- Verma, A.K.** 1999. Estimation of regeneration loss due to forest fire in south Gujarat forests. *Indian Forester*, May 1999: 445–451.