AN OVERVIEW OF SUSTAINABLE FOREST MANAGEMENT THROUGH EFFECTIVE FIRE MANAGEMENT

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Abstract
Sustainable forest management addresses forest degradation and deforestation. Forests and trees when sustainably managed, make vital contributions both to people and the planet, bolstering livelihoods, providing clean air and water, conserving biodiversity and responding to climate. Successfully achieving sustainable forest management will provide integrated benefits to all, ranging from safeguarding local livelihoods to protecting the biodiversity and ecosystems provided by forests, reducing rural poverty and mitigating some of the effects of climate change. Protect existing undeveloped forests and green spaces from further development. Enhance the health, condition and function of existing tree and forest fragments to provide such things as air quality and temperature regulation, hydrologic function and habitat. In many parts of the world, planned fire is included as a component for sustainable forest management. It can have a very significant and beneficial impact on reducing fire severity and damage, and it assists firefighters in suppressing fires. It also has many benefits for ecosystem sustainability, maintenance and restoration. In order to emphasize the roles fire plays in sustaining and restoring ecosystems, planned fire should be based on a legal, institutional and policy framework. This paper, provides the basis and structure for strategic and tactical planning and implementation actions. Fire awareness and educational activities can be very effective in involving the community and other groups in a fire management program and in engaging the community as a responsible partner, to make fire a good servant when planned, as well as a bad master when not planned.

Introduction

Sustainable forest management is the management of forests according to the principles of sustainable development. Sustainable forest management is aimed at keeping a balance between three main pillars: ecological, economic and socio-cultural. Successfully achieving sustainable forest management will provide integrated benefits to all, ranging from safeguarding local livelihoods to protecting the biodiversity and ecosystems, provided by forests, reducing rural poverty and mitigating some of the effects of climate change.(LEDS GP, 2016)

Sustainable forest management addresses forest degradation and deforestation Antony and Lal (2013). Forests and trees, when sustainably managed, make vital contributions both to people and the planet, bolstering livelihoods, providing clean air and water, conserving biodiversity and responding to climate. Successfully achieving sustainable forest management will provide integrated benefits to all, ranging from safeguarding local livelihoods to protecting the biodiversity and ecosystems provided by forests, reducing rural poverty and mitigating some of the effects of climate change. Protect existing undeveloped forests and green spaces from further development. Enhance the health, condition and function of existing tree and forest fragments to provide such things as air quality (FAO, 2014) and temperature regulation, hydrologic function and habitat (Antony and Lal, 2013).

Effective Fire Management For Sustainable Management

Fire is a good servant when planned, but a bad master when carelessly used, thus effective fire management should be based on a legal, institutional and policy framework. This framework provides the basis and structure for strategic and tactical planning and implementation actions. The legal framework comprises broad, multi sectoral resource management plans. These plans elaborate the management, protection and restoration of land and resources. A fire management is possible to address all actions within the area which may be best to develop for selected actions, such as fire prevention or the use of planned fire. However inclusive the fire management plan is, safety should be a principal component Mcpfe.org. (2011). Therefore Effective fire management should ensure that:.-

- All fire management plans and activities should be based on a clear and comprehensive policy, legal and institutional framework.
- Plans should be prepared at an appropriate level of detail for every aspect of fire management, including use, prevention, fuel management, detection, initial attack, large-fire suppression and restoration.
- A policy should be established that sets the safety of firefighters, fire managers and the public as the highest priority.

- In areas where multiple agencies or organizations have fire management responsibilities, a process should be developed to determine, in advance of a fire, who will assume the lead role and duties.
- Resource management plans should include analysis of the actions that increase or decrease the risk and hazards affecting fire behaviour, fire damage or benefit, as well as impacts on the safety of firefighters, fire managers and the public.
- Plans should be based on the types of ecosystems, potential fire effects, fire regimes, and social, economic and environmental values.

  Fire management actions can be applied to all types of forests and woodlands and to areas designated for production, conservation, cultural activities or as protected areas and reserves. The same general approach to fire management should be followed in all areas. However, the specific management objectives for each environment must be taken into account though, the operational standards and actions may vary (FAO, 2014).
- Strategic actions for fire management in natural or protected areas and reserves include but are not limited to:
- Fire plans and guidelines should identify the unique character of and objectives for the area, considering the role that fire plays in restoring or maintaining that special character.
- In areas that require periodic fire to restore or maintain the character of the area, the likelihood that fire will impact other resources, communities and people outside the area should be taken into account.
- Consideration should be given to using appropriate fire management actions that will not adversely affect surrounding areas, assets or sustainable livelihoods.
- Plans, guidelines and operational procedures should be developed with a view to mitigating any unwanted or damaging effects from planned burning in these areas.
- Care should be taken to ensure that invasive plants or diseases are not introduced through fire suppression actions and the use of fire equipment and machinery.

Fire Management Strategy

Fire awareness and educational activities can be very effective in involving the community and other groups in a fire management program and in engaging the community as a responsible partner (Ravi Prabhu, *et al*.,1999) A well-informed public will be more likely to use fire carefully and to adhere to policy and legal boundaries. It can assist in the prevention, detection and reporting of fires, work with fire personnel to control unwanted fires, and provide a source of local and traditional knowledge.

Fire detection is an important part of an effective fire management programme. It can be accomplished in a variety of ways: satellite imagery, fire observation towers, aerial surveillance, lightning detection systems, or monitoring and reporting of fires by the local population. When local residents understand the risk and damage from unwanted, severe fires and participate in a community-based fire management programme, they are a very effective part of the overall system (Stokke,1999).Communication with the public is needed to inform them of the fire status and of threats to the community. Local media – radio, television and the press – as well as other traditional methods and emerging technologies of information dissemination need to be part of the total communications plan (FAO, 2014).

Fire Prevention

Fire prevention may be the most cost-effective and efficient mitigation programme. an agency or community can implement. Preventing unwanted, damaging fires is always less costly than suppressing them. Prevention programmes that are accepted and promoted within the community not only reduce costs and resource damage, but also promote understanding of the role and impact of fire in the ecosystem.

In many parts of the world, planned fire is included as a component of fire prevention. It can have a very significant and beneficial impact on reducing fire severity and damage and it assists firefighters in suppressing fires. It also has many benefits for ecosystem sustainability, maintenance and restoration. In order to emphasize the role fire plays in sustaining and restoring ecosystems, planned fire is addressed (FAO, 2014).

- In many ecosystems, fires tend to become large due to an increase in fire intensity and rate of spread or area involved. A low-intensity, slow-spreading fire that is easily suppressed can transform itself quickly when environmental or meteorological conditions change.

- Management of large fires can be very different. A 'large-fire event' is not defined so much by the size

of the fire as by the duration and complexity. A fire in grasses and light fuel can spread to a relatively large size very quickly, but the suppression techniques may not be different from those of a very small fire.

- While the complexity of the situation may require that fire suppression personnel shift from the initial or extended attack to a large-fire event, at this point a large-fire response, crews and supervisors may be challenged to use unfamiliar strategies and tactics and to implement a logistics and planning organization at a new and larger scale.

Managing Multiple Incidents

- Some of the most difficult and complicated situations occur when multiple fires start simultaneously or when additional fires are discovered before the initial ones are brought under control. This situation is further complicated when the fires occur across several jurisdictions with different legislative or institutional management objectives. These cross-boundary incidents can impact local jurisdictions as well as national boundaries.

- During periods of multiple fires, fire suppression resources may be depleted, requiring managers to allocate resources based on priorities and potential threats. Often the priorities for protection are widely varied, which makes it difficult to determine where fire suppression resources should be deployed. Moreover, these decisions are often made without access to adequate information. Setting up procedures in advance reduces the risks to health and safety and the potential damage to resources and communities.

- In addition to preplanning these actions, an effective way to manage priority-setting during multiple incidents is to have established a coordinating group beforehand composed of senior managers from the agencies and organizations involved, including community groups. This group will meet during the emergency to set priorities and agree on critical areas of concern. However, it should also meet throughout the year to confer on all aspects of interagency or international concerns, such as standards, objectives, priorities and procedures for coordination and mutual assistance during emergencies.

- Another important factor would be agreement to use ICS and to expand its scope as the number of fires increases and the impact expands to more jurisdictions. The ability to continue the same management structure at any level of complexity is important in critical periods.

Livelihoods and Poverty

Stokke (1999), stated that, within the natural environment, fire can be a normal part of the cycle of ecosystems and can ensure a healthy, sustainable source of food and resources. It is a tool and a beneficial force in improving people's lives. Fire is a key component in the agricultural practices of people in many different ecosystems. In some areas, it is managed by traditional rural communities to maintain healthy forests, ranges and grasslands that provide habitats for hunting and for the gathering of fruits, nuts, grains and other food sources.

A comprehensive fire management programme can contribute positively to achieving specific features of human rights and livelihoods: poverty alleviation, food security, clean water, good health, education and participation in the economic life of the country. Protection from unwanted, damaging fires and the management of fire to benefit society can contribute to achieving these goals.

Safety Considerations for Firefighters and Civilians

For firefighters and fire managers, safety is a core value and cannot be compromised. It is a critical part of all activities, from planning through restoration. In fact, one of the most common reasons for establishing a fire management organization is to protect firefighters and communities from unwanted fires (Froylán *et* al*,* 2001).

Sustainable Ecosystems and Environmental Impacts

Maintaining sustainable, properly functioning ecosystems should be a goal for all fire management programmes. In many instances, attention is paid to the damage and destruction of fires and not to the underlying ecological or social causes. Ecosystems have evolved over time with different fire regimes. Some fire-dependent, healthy, sustainable ecosystems experience fast-moving, high-intensity fires that can nonetheless

cause substantial damage to structures and resources. The same types of fires may occur in fire-sensitive ecosystems and cause damage to ssrestoration activities on achieving a healthy balance between ecosystem health and public safety (Ravi Prabhu, *et al*.,1999).

Conclusion

Sustainable forest management could be achieved using fire, only when it is planned, using community education and awareness for a sustainable development.

Recommendation

For a sustainable forest management to succeed

- Fire should be planned
- Communities should be involved
- Awareness should be created
- Fire education should be created to avoid un wanton destruction

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