Research article

Understanding perceptions of stakeholder groups about Forestry Best Management Practices in Georgia

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ABSTRACT

Forestry Best Management Practices (BMPs) are critical in ensuring sustainable forest management in the United States because of their effectiveness in protecting water quality, reducing soil erosion, maintaining riparian habitat, and sustaining site productivity. The success of forestry BMPs depends heavily on coordination among primary stakeholder groups. It is important to understand perceptions of such groups for a successful forest policy formulation. We used the SWOT-AHP (Strengths, Weaknesses, Opportunities, and Threats analysis with the Analytical Hierarchy Process) framework to assess perceptions of three stakeholder groups (loggers, landowners, agency foresters) about forestry BMPs in Georgia, the largest roundwood producing state in the United States. The agency and logger stakeholder groups gave the highest priority to improved reputation under the strength category, whereas the landowner stakeholder group perceived sustainable forestry as the highest priority under the same category. Lack of landowner education was the highest priority under the weakness category for landowner and agency stakeholder groups, whereas the logger stakeholder group selected lack of trained personnel as the highest priority under the same category. Agency and landowner stakeholder groups gave the highest priority to training and education while loggers indicated maintenance of forest-based environmental benefits as their highest priority under the opportunity category. Finally, landowners and agency stakeholder groups perceived more regulations and restrictions as most significant in the threat category whereas the logger stakeholder group was most concerned about the insufficient accounting of cost sharing under the same category. Overall, selected stakeholder groups recognize the importance of forestry BMPs and had positive perceptions about them. A collaborative approach based on continuous feedback can streamline expectations of stakeholder groups about forestry BMPs in Georgia and several other states that are interested in maintaining high compliance rate of forestry BMPs for ensuring sustainable forest management.

1. Introduction

Silvicultural activities impact 2.4% of the total length of rivers and streams in the United States (U.S. Environmental Protection Agency, 2000). Silviculture is listed as a source of impairment to rivers and streams in 26 states, including nine in which it is considered a major source of impairment. Therefore, several states have developed and adopted forestry Best Forestry Practices (BMPs) over time to reduce the impact of silvicultural activities on water quality in response to amendments to the Federal Water Pollution Control Act of 1972 and the Clean Water Act Amendments of 1977 (Cubbage, 2004).

The effectiveness of forestry BMPs as a tool for water quality protection is well established. Aust and Blinn (2004) reviewed several studies assessing the impacts of forestry BMPs for timber harvesting and site preparation on site productivity and water quality in the 12 physiological regions of the eastern United States. They reported that existing forestry BMPs help improve water quality but can be refined further to reflect site-specific conditions. Grace (2005) reviewed several studies and found that BMPs can minimize the effects of non-point source pollution caused by silvicultural activities in the southern United States. Anderson and Lockaby (2011) reviewed 17 studies from different physiographic regions in the southern region of the United States (8, 6, and 3 from

the Coastal Plain, Piedmont, and Mountains, respectively) and concluded that forestry BMPs improve/maintain water quality, with streamside management zones as the most effective measure. Cristan et al. (2016) reviewed a total of 81 studies (30, 31, and 20 studies in the southern, western, and northern regions of the United States, respectively) and found that correctly implemented forestry BMPs protect water quality nationwide and help states in achieving their water quality goals. Apart from studies which focus on the effectiveness of forestry BMPs in reducing non-point source pollution, Ice et al. (2010) reported that the compliance rate of forestry BMPs has increased significantly nationwide since 1972 and currently stands at about 89% at the national level.

The continued success of BMPs in minimizing non-point source water pollution has made them an important tool for ensuring forest stewardship. The United States Environmental Protection Agency recently reaffirmed its approval of forestry BMPs to address water quality problems related to forest roads (U.S. Environmental Protection Agency, 2016). Similarly, forest certification programs like the Sustainable Forestry Initiative (SFI) rely on forestry BMPs to set their certification standards. For example, as a part of the SFI's Fiber Sourcing Standard, certified forest products mills must include contractual obligations for loggers to follow forestry BMPs and mills must conduct periodic checks on harvest sites from where they sourced wood (Sustainable Forestry Initiative, 2015).

As effective as BMPs are in sustainable forest management, to answer the question of whether BMPs are working as intended, and if they are doing enough to mitigate the impacts of human activity on the environment, the social and economic perspectives should not be ignored (Jackson, 2014). While Phillips and Blinn (2007, 2004) have expressed a need to standardize the guidelines of compliance monitoring programs to make them comparable across regions, Jackson (2014) points out that the human dimensions of BMPs make regional variations unavoidable. For example, as discussed in Carter et al. (2015) forestry BMPs in the Southeastern United States developed in a non-regulatory environment with heavy input from industry and other stakeholders because of the region's market structure and general aversion to governmental rules and regulations. This contrasts with the Pacific Northwest whose forestry BMP structure has evolved into one that is regulatory with significantly more government involvement.

Stakeholders are pivotal to the implementation, development, and assessment of BMPs. Only a handful of studies have focused on economic (Cubbage, 2004; Shaffer et al., 1998) and welfare (Sun, 2006) dimensions of forestry BMPs. Studies which focus on social dimensions of forestry BMPs (Knoot and Rickenbach, 2011; McGill et al., 2006; Munsell et al., 2006) primarily examine the attitudes of forest landowners and the impact of policy instruments on adoption of sustainable forest management practices, including BMPs by landowners (Maker et al., 2014; Provencher et al., 2007; Vanbrakle et al., 2013). To the best of our knowledge, only Husak et al. (2004) has compared the perceptions of three stakeholder groups (family forest landowners, forestry consultants, and industry) about perceived values of benefits derived from forestry BMPs in Mississippi.

Different stakeholder groups, including forest landowners, are involved in the forestry supply chain, and each of them faces a unique set of constraints in the context of forestry BMPs. This gives us reason to believe that various stakeholder groups would have different perspectives about forestry BMPs. A better understanding of perceptions of stakeholder groups about forestry BMPs may inform policymakers about possible conflicts among stakeholder groups. This information can be utilized for formulating better policies for improving effectiveness of forestry BMPs as a tool of sustainable forest management in the United States. Coupled with the physical studies on the effectiveness of forestry BMPs, the perspective gained from our research on human dimensions of forestry BMPs will provide a complete understanding of the challenges related to forestry BMPs in the United States and hopefully, will feed into the future forest policies at regional and national levels.

2. SWOT-AHP framework

SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is a planning tool used to identify internal strengths and weaknesses and external opportunities and threats related to an industry, firm, project, product, or individual (Ghazinoory et al., 2011). However, SWOT analysis does not provide a comparison of the relative priority of identified factors under different categories. The AHP (Analytic Hierarchy Process) is a multi-criteria decision-making technique that measures the relative priority of one factor over other factors through pairwise comparisons (Saaty and Vargas, 2012). The data obtained through pairwise comparisons are analyzed by following Eigenvalue technique to determine priority values of factors as explained in Dwivedi and Alavalapati (2009). When applied to the factors identified as a part of SWOT analysis, the AHP enhances the information through a measured comparison of the importance across factors. This provides deep insight into the potential agreements and conflicts among stakeholder groups and can be of use with policies dealing with sustainable management of natural resources. Another advantage of utilizing the SWOT-AHP framework is that a large number of participants are not needed, as inputs provided by a few experienced respondents are sufficient to reflect perceptions of a stakeholder group (Shrestha et al., 2004). The use of SWOT-AHP has become popular in the sustainable management of natural resources because of its simplicity in identifying points of agreements and disagreements across stakeholder groups for conflict resolution (Dwivedi et al., 2016; Kukrety et al., 2013; Kurttila et al., 2000; Ramirez et al., 2012).

3. Methods

We used the SWOT-AHP framework to assess the perceptions of three forestry stakeholder groups— loggers, landowners, agency foresters (Georgia Forestry Commission,[1] GFC)— about forestry BMPs in Georgia, the largest roundwood producing state in the United States (Oswalt et al., 2014). Forestry BMPs in Georgia were developed in 1981 and updated several times thereafter (Georgia Forestry Commission, 2009). Currently, forestry BMPs are non-regulatory in Georgia because silvicultural activities are exempt from the permitting processes provided forestry BMPs are followed. Compliance is monitored by the GFC and regulatory agencies only get involve when improper implemented BMPs are not sufficiently mitigated by a responsible party. Survey results of the GFC suggest that, on an average, the forestry BMP implementation rate at the state level has been between 90% and 95% since 2004 (Georgia Forestry Commission, 2015).

We conducted two focus group discussions (Washington, GA and Forsyth, GA) with loggers operating in Georgia to determine suitable factors under each SWOT category. At both focus group discussions, the participants were split into one of two groups: large (35 or more loads delivered per week) and small (less than 35 loads delivered per week). The cut-off of 35 loads delivered per week was decided by participants of focus group discussions only. The focus groups were conducted as open-ended discussions where participants were asked to share their thoughts on internal factors (strengths and