

the use of incentives and market-based strategies to increase forestland value and to help accomplish conservation goals. These can be in the form of direct payments to landowners, through trading credits or other market-based approaches. Ecosystem services including carbon credits, water quality and quantity, and conservation values can add substantial economic return from forests. One promising option is to allow landowners to bundle or stack payments for ecosystem services. We use an integrated approach to bundle values of different ecosystem services including carbon, water, and fish and wildlife conservation. We outline some of the policy and regulatory frameworks for some of the emerging markets for ecosystem services in the United States, and discuss the role that different regulatory agencies play for each of these services. We then assess the potential benefits for bundling different ecosystem services including carbon credits, water quality trading, and wetland and species mitigation banking. Our purpose is to establish a framework for assessing the potential value for different ecosystem services, understand the process for combining these services, and develop an integrated approach for bundling these services. This process can be used to restructure public incentive programs so that multiple resource benefits can be captured.

Ecosystem services certification in China

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Independent third-party forest certification emerged in the 1990s as a tool for assessing and communicating the environmental and social performance of forest management operations. Today, forest certification is mainstream, supported worldwide by major producers and buyers, and elements of certification are directly or indirectly required in a number of national forestry or government/public procurement policies. There are 2 international forest certification schemes and dozens of national ones. All these schemes have promoted environmental, social and economic sustainability for forest management, and ecosystem services play a very important role in the whole forest certification process, but all international and national forest certification schemes, except in China, do not have any scope of ecosystem service certification or special and independent ecosystem service certification standard(s) assessing the special requirements of ecosystem service. The paper will discuss the design, development, operation and management of ecosystem service certification in China as 2 kinds of other special scopes of forest certification apart from certification of forest management and chain of custody (COC). China, through the China Forest Certification Scheme (CFCS) which is managed by the China Forest Certification Council (CFCC) has identified 2 scopes of ecosystem service certification covering forest parks and nature reserves, and 2 independent certification standards for assessing them. China also developed audit directives and operational guidelines for certification of forest parks and nature reserves in corresponding certification standards. The paper also analyzes 2 case studies of CFCC certified forest parks and nature reserves with its impact of ecosystem service management.

Development of voluntary forest certification schemes in Russia and their impact on forest management

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Recently at public hearings in the Russian Parliament (State Duma) of the Russian Federation, at the media the issues of voluntary forest certification were actively discussed. Some politicians would like to see forest certification that is fully consistent with the current state strategies and existing interests in the forest sector. There are fears that international certification organizations may somehow “disconnect” Russia from certification and thereby deprive the forest business of the international market. Some statements were done that “The national certification scheme will be driven by national interest and will defend Russia’s position on global markets”. The article explores all policy and trade implications of the potential national forest certification scheme, which is fully in line with existing national legislation and government interests. The following aspects are analyzed: - Fundamental difference between stakeholder based international forest management standards and expert based national legislation; -The concept of risks from the point of view of international stakeholders and national governments; - Independence and credibility of certification in relation to market demand for certified forest products; -The possibility of acceptance of national forest certification schemes by buyers through intergovernmental agreements; -The possibility of suspension of countries from international forest certification schemes in case national legislation will create a significant barrier for international certification scheme; - Harmonization of certification requirements and regulatory framework of forest management. The study is the first of its kind to describe the limits of national regulations in international forest certification and forest product trade. Supported by Institute of Geography RAS assignment 0148-2019-0006.

Environmental Impact Assessments for rural properties: case studies from producing eucalyptus energy wood in Goiás, Brazil / Avaliação de impacto socioambiental de propriedades rurais: estudos de caso da produção de lenha de eucalipto em Goiás

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A avaliação de impacto de atividades produtivas rurais é apontada como importante ferramenta de apoio aos produtores para atingir patamares de produtividade com a adequada conservação dos recursos naturais, além de possibilitar ajustes para a obtenção de certificações de produção sustentável. A demanda por biomassa para geração de energia vem aumentando e o cultivo de eucalipto é a opção mais lucrativa para o setor, expandindo-se para novas fronteiras de produção. O trabalho avaliou duas propriedades de referência em 2018 no cultivo de eucalipto para produção de lenha nos Municípios de Rio Verde e Cristalina, em Goiás. Para tanto, foi utilizado o Sistema Ambitec-Agro (Sistema de Avaliação de Impacto Ambiental de Inovações Tecnológicas Agropecuárias), desenvolvido pela Embrapa e que integra 125 indicadores quantitativos de 24 critérios de avaliação de desempenho socioeconômico e ambiental da atividade produtiva, sempre comparando o uso atual da terra frente ao anterior. A atividade contou com apoio financeiro do Sebrae/Goiás. Os resultados apontaram para a adequação dos sistemas de produção adotados, já que as duas propriedades apresentaram índices de impacto final positivos de 3,1 em Rio Verde e 5,8 em Cristalina. O Sistema Ambitec-Agro não visa comparar propriedades rurais, já que cada uma possui um contexto próprio de produção ajustado à sua localização geográfica e histórico do produtor; mas sim, avaliar o sistema de produção adotado no contexto geral da propriedade. Ao apontar impactos positivos e negativos, os resultados auxiliam na gestão ambiental da propriedade com critérios de qualidade e sustentabilidade produtiva.