

Chapter 5

Commentary: Small Retention in Polish Forests from a Forest Management Perspective—Copying of Existing Could Be Right Path



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The case has shown how a distinct approach in natural disaster mitigation and resilience using small retention facilities in public forests can be effective. These insights also offer a new perspective on how public forests and forest lands can be managed to mitigate extreme events like floods, droughts, or wildfires, and contribute to resilience on climate change at the same time. Afforestation has been perceived as the most common sustainable measure used for forest and land management in the most countries, specifically developing one (Kapović Solomun et al. 2018). However, another possible approach for mitigating extreme events using small water retention facilities will be argued here. There are numerous similarities and challenges in the implementation of small retention facilities that can be recognized by neighboring, particularly post-communist countries, but there also possible solutions of how to cope with them. Natural resource dependent countries need to start to form consistent implementation of legislative framework and policies, where government leadership is crucial. Knowing that the main abiotic disturbances in Europe are fire, wind, flooding and drought (Flannigan et al. 2000; Moriondo et al. 2006) makes information relating to climate change and the human-induced factors even more valuable. Disaster prevention and mitigation has been a priority for the last several decades, but the question is this: How do governments find the trade-offs and the right path for the future and provide sustainability for forests, biodiversity, land and human demands at the same time? This case is specific to Poland and provides the possibility to introduce new natural and technical measures in forestry to prevent and mitigate flood, drought and wildfire. At the same time, this is an example relevant to countries with a prevalence of public forests and centralized forest management: What can be done to mitigate natural disasters through the forestry sector? Small retention facilities are a step forward in improving the prevention and mitigation of such extreme events, with, unfortunately, limited evidence of effectiveness so far. Using forests for successful and large-scale prevention and mitigation requires con-

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sistent policy-directed solutions and strong cooperation among governments, forest scientific agencies, local communities, private landowners, private forest owners and NGOs.

Forest Ownership and Forest Stewardship

Forest ownership is a sensitive subject, particularly in regards to implementation of new measures like small retention facilities. When the new measures are brought up and consider public forests with centralized forest management, the various stakeholders quickly voice numerous challenges and conflicts. Knowing that, what can be realistically expected in regards to private forests and privately owned land, where ownership and land rights are far more delicate? Private forest owners are an important target group in terms of prevention and mitigation of extreme events, notably in the countries with a larger percentage of private forests. How is it possible to involve land and forest owners and convince them to participate in the utilization of small retention facilities and harmonize all interests within their community for everyone's benefit? These are important questions for the future.

Introduction of new techniques, measures, and approaches (like small retention facilities), will influence private property and need efficient public-private partnership. Private landowners usually look into costs, benefits and possible effects any approach may have, and it all comes down to one question: Why would I want to pay for that? Normally, private sector engagement in adaptation assures greater investments and services in core development sectors (Biagini and Miller 2013). Community involvement and private-public partnerships can be powerful mechanisms in coping with floods (Chartres and Noble 2015) but also other natural disasters. Transformational change and policy vision are a prerequisite for a successful implementation of science-driven natural or technical measures. Obviously, extreme events will become more severe and frequent. In this case, small retention facilities could be "a bright spot" for forest managers and policy makers in other countries who will use this example and incorporate it in existing management of forest resources. Land and forest management carries a great deal of importance in addressing current risks that are accentuated by climate change impacts; this is also stated in IPCC reports (2012). However, sustainable forest management and the prevention and mitigation of floods, droughts, and wildfires, are still not perceived as an important endeavor in developing and post-conflict countries with weak socio-economic conditions (Kapović Solomun et al. 2018). Under these circumstances, the forest- and land-related legislative framework is usually adequate and includes "sustainability", but the resources for implementation are limited. Likewise, the pros and cons of centralized forest management are an argument worth consideration within country-specific circumstances. For instance, centralized forest governance and prevalence of public forests in countries with a high level of corruption and weak implementation of legislative frameworks does not usually lead to good forest stewardship. Sometimes, such centralized power can serve as an open channel for corruption among

forest managers; this often leads to the exaggerated use and future decrease of forest quality, decreased interception and evapotranspiration, soil storage capacity, all of which increases the possibility for flooding and landslides as well. Furthermore, fire is understood as a natural factor, but wild fires are often threats to forests, public safety and property (Martell 2007), endangering biodiversity and land. This phenomenon is also frequently caused by humans and made more likely due to climate change. With all of this in mind, small retention facilities in the forests are potential solutions to these problems that need to be supported with continuous education and by raising awareness in communities to prevent the unnatural causes of wildfires.

Role of Local Stakeholders

Local governments often play a vital role in modulating the outcomes of sustainable forest and land initiatives (Kemp et al. 2005). Several example cases have shown that decreasing the influence and role of local community institutions has resulted in lower success rates in forest management (Ostrom 2009; Dressler et al. 2010). A greater level of forest degradation is usually evident in the vicinity of rural households (Kapović et al. 2013) where people perceive public forests and centralized forest governance less as communal property, particularly in developing regions with weak economies. Generally, one of the shortcomings of many land- and forest-related studies is the exclusion of the views and experiences of the landowners and land users, particularly in forest-dependent communities (Andersson et al. 2011). Natural flood management and ecosystem based approaches can manage flood risks, impacts and vulnerability (Gill et al. 2007; Munang et al. 2013), but it should be developed in close cooperation with local communities. A connected (involved) community (local, national, regional and international) is likely to make major headway in understanding the role of small retention facilities in recent floods, drought and wildfires. Involving stakeholders who are dependent on land, forests, or agriculture proves influential in their understanding of natural disasters, opportunities for prevention and mitigation, and their implication and position within those processes. Encouragement and active inclusion of private land and forest owners will increase the chances for success of any natural or technical measure, principally on private land, but also to prevent some natural disasters like wildfires. This case is also an interesting example of wide participation of different groups of stakeholders in a small retention facilities program related to public forests. However, it would be intriguing to see a community's response if small retention facilities are planned on private land or in private forests. Implementation of coherent national forest policy focused on sustainability and multi-functionality is a good test for even centralized forest management and public forests.

Why Small Retention Facilities?

A small retention program in the Polish forests comprises natural and technical measures for lowland and upland forests. The primary advantages are mainly related to the natural retention facilities, while adverse effects are related to the technical small retention facilities, especially in terms of biodiversity preservation. A recent study (Huang et al. 2018) suggests that rainfall and the forest landscape are pivotal factors triggering flood event alterations in lower return periods, which flood event dynamics in higher return periods are attributed to hydrological regulations of water infrastructures. Water balance, and thus retention of forested landscapes, is, to a large extent, controlled by forest ecosystems (Döll 2009), which include surface runoff as determined by evaporation, transpiration and water flow routing (Eisenbies et al. 2007). Small water retention facilities under forests contribute to increased evaporation and transpiration and lead to fewer flood events with a “keep the rain where it falls” approach. Hence, if evaporation and transpiration are predicted to decrease, that can increase surface runoff (Schlesinger and Jasechko 2014) and, consequently, floods. Still, small reservoirs may lose up to 50% of their stored volume due to evaporation in many regions and the high ratio of surface/volume area. Evaporation constitutes a major component of the water balance in the reservoirs and may significantly decrease flood events (Ashraf et al. 2007). In forests, the interception of precipitation and its loss by evaporation is typically 10–35% of precipitation (Wang et al. 2007). This interception loss in the forests is compatible with transpiration and evaporation less than 65–90% (Schlesinger and Jasechko 2014). Typically, forests and forest land increases evapotranspiration and tends to decrease the number of flood events (Ryu et al. 2011) and droughts.

Opportunities

Numerous public forest companies within the Europe have earned a Forest Stewardship Certificate (FSC) that confirms that the forest is managed with the intent of preserving the natural ecosystem and benefitting the lives of local people and workers all while ensuring it sustains economic viability. Forest management certification helps protect the people, plant and animal species that live in and around, and depend upon, the forest. Following a brief initial pre-assessment, the evaluation process consists of an in-depth review of forest management processes and their environmental, social, and economic impact, through defined criteria and indicators. FSC forest management certification is valid for five years and subject to annual checks whether FSC requirements are continuously met. It is a very competitive certificate and requires accomplishment in many areas of forest management, particularly whether a particular management maintains forests’ biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions at all levels. Small retention facilities as a positive practice

should be introduced to the existing FSC criteria and indicators needed to sustain public forest management, as their implementation serve both a social and ecological function and mitigate natural disasters at the same time. Stakeholders' engagement in a participative approach can present another opportunity back to back with close cooperation between science study and practice in the application of new approaches and techniques.

Final Remarks

Small retention facilities are an exceptional example of how public forests can be managed to provide sustainability and multi-functionality and to mitigate floods, drought and wildfire at the same time. It could become an ideal model for countries with prevalence of public forests and centralized forest management. Effective stakeholder engagement, applying participatory approaches to create and implement small retention facilities is shown as successful example of adaptive public forest management. The biggest challenge to this approach is finding incentives and trade-offs for private land and forest owners so that small retention facilities are also used on private land and private forests. Furthermore, even though small retention facilities in Polish forests are a great example of how natural disasters can be mitigated through the forest management, it is challenging to make a predictive evaluation, since outcomes will very much depend on country-specific circumstances. Furthermore, evidence of its effects is as of yet limited. The case can be understood as a direction what else can be done for mitigation of extreme events in public forests under centralized management. Extreme events affect poverty and ecosystem vulnerability through their multiplier effect. Small retention facilities could fundamentally improve people's lives and security, in addition to mitigating floods, drought and wildfires. Impacts of new forest practices clearly showed the necessity to gain more quantitative insights prior to further evaluation of the effects.

For the future, a stronger understanding of natural disasters, impacts and relationships with land use is essential to inform decision-makers regarding the importance of forests and sustainable forest management, in prevention and mitigation of floods, drought and wildfires. Small retention facilities are also a good idea for countries in a weak socio-economic situation that suffer from floods, drought and wildfires. They can benefit from the existing knowledge, available resources and results taken from other countries that have already developed and applied new approaches and techniques in forestry, agriculture, adaptation, and mitigation. Sometimes, "copying" policy and approaches from other countries and adopting existing measures, techniques, and approaches is necessary to sustain a globally feasible path.

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