



Making Sustainable Forest Development Work: Formulating an Idea for a More Appropriate Green Policy Paradigm

Dodik Ridho Nurrochmat^{1*}, Muhammad Alif K. Sahide² and Micah R. Fisher³

¹Department of Forest Management, Faculty of Forestry and Environment, IPB University, Bogor, Indonesia, ²Laboratory on Forest Policy and Entrepreneurship, Faculty of Forestry, University of Hasanuddin, Makassar, Indonesia, ³Fellow, Research Program, East-West Center, Honolulu, HI, United States

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INTRODUCTION

There is increasing pressure on the conversion of forest areas for food, energy, development, and other purposes. Development that is driven by green growth is being proposed as a solution. The problem, however, is that many ideas driving the notion of “green” growth are trapped in a contradiction that overwhelmingly focuses on the “green” while neglecting the growth, even if there is a compelling case to be made that “green” and “growth” are not two competing paradigms (World Bank, 2012).

Freedom should be the primary element of development. It means that the only acceptable evaluation of human progress is primarily and ultimately enhancement of freedom, and the achievement of development depends on people’s free agency (Sen, 1999). Peacock (2021) argues that the freedom proposed by Sen (1999) is a combination of rationality and commitment. Commitment is essential in development strategy, in addition to the mainstream rational choice theory (Peacock, 2021).

Sustainable development is a global issue and forest regime is currently dominates global sustainability discourses on the management of the world’s forests (Giessen, 2013; Sahide et al., 2015). However, such discourses also pay less attention to the different situations in developed and developing countries. For instance, reducing emission and net-zero deforestation has been promoted as policy ideals to be implemented according to the Paris Agreement (UNFCCC, 2015) is less considering the countries’ social, economic, and ecological differences. Thus, promoting more objective sustainable development principles, i.e., reversibility or limits (Letey, 1973), adaptability or tolerance (Letey, 1973), rational commitment (Kuznets, 1955; Sen, 1999; Peacock, 2021), and legitimacy (Nurrochmat et al., 2016b; Peacock, 2021), is necessary to build more appropriate global perspectives in sustainable development.

The article aims to promote an idea for establishing a more appropriate set of principles of sustainable forests. The argument provides insight into sustainable forest development in ways that are not only determined by the temporary disturbance of forests (environmental degradation) but also the potential for economic growth, which considers the ability of forests to recover (see Silva, 2021) using the concepts of limits and tolerance (Letey, 1973), rational commitment (Sen, 1999; Peacock, 2021) and legitimacy (Nurrochmat et al., 2016b). Scientific arguments support the idea of the article, for instance, Environmental Kuznets Curve (EKC) theory (1955), limits and tolerance of ecology (Letey, 1973), and also the green development strategies of the World Bank (2012). The argument is laid out for the purposes of practical implementation.

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*Correspondence:

Dodik Ridho Nurrochmat
dnurrochmat@apps.ipb.ac.id

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ECOSYSTEM DEGRADATION AND RECOVERY PERIODS OF DEVELOPMENT

Economic growth and environmental sustainability are like two sides of a coin inseparable from the sustainable development concept. Studies of contemporary popular natural resource economics tend to apply the *Environmental Kuznets' Curve* (EKC) – a modification of the *inverted U hypothesis* (Kuznets, 1955) that explains the interrelation between economic growth as a function of per capita income and the level of environmental degradation (Figure 1).

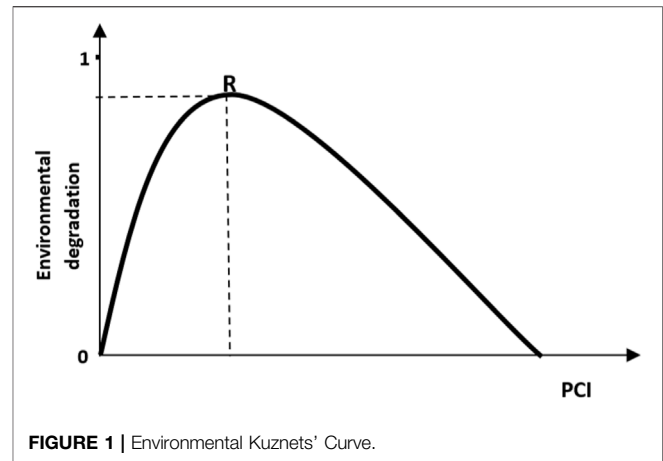
It is commonly found in the development approaches in developing countries that rely on intense pressures on land and natural resources, where increasing per-capita income (PCI) is compensated by the depletion of natural resources and environmental degradation. The model then suggests that after achieving a certain level of human welfare, a turning point will occur whereby the higher levels of welfare will initiate broader interests, policies, and outcomes toward environmental sustainability. Environmental degradation thus decreases along with increasing PCI and broadly reflects conditions found in developed countries.

The Reversibility Principle

In the early stages of development, environmental degradation is part of the economic development strategy, as long as the degradation does not exceed the limits or ability of the environment to recover (Letey, 1973) or the natural regeneration's ability of degraded forests (Silva, 2021). Thus, limits on the exploitation of natural resources must be considered in the development strategy.

A universal illustration of the policy strategy for using natural resources and environmental recovery is presented as a metaphor of choosing a flyover road development strategy. The first policy option is to close the old road temporarily with the consequence that people who want to go through cannot pass. Meanwhile, the second option is to open the road halfway so that people can still pass, but results in more extended traffic jams. The completion of the flyover project can be considered a turning point in achieving smoother traffic patterns, which is similar in this case to support the turning points of environmental recovery. Theoretically, faster transitions to environmental recovery are possible through the first option, whereby total closure of roads to make flyovers are applied. However, this can only succeed with particular prerequisites, namely that there are alternative access points to important places such as hospitals, transportation hubs, and other vital facilities. Still, the benefits of the flyover are quickly completed so that smoother traffic patterns will recover with better quality (Nurrochmat et al., 2017).

In line with this illustration, economic development that causes environmental disturbances, for instance forest degradation or temporary deforestation, can still be considered an option of sustainable development strategies if the disturbance is laid within the limits of being reversible and encourages the acceleration of environmental recovery as welfare increases. In this context, it is clear that the concept of sustainability is bound to and cannot be separated from human welfare.

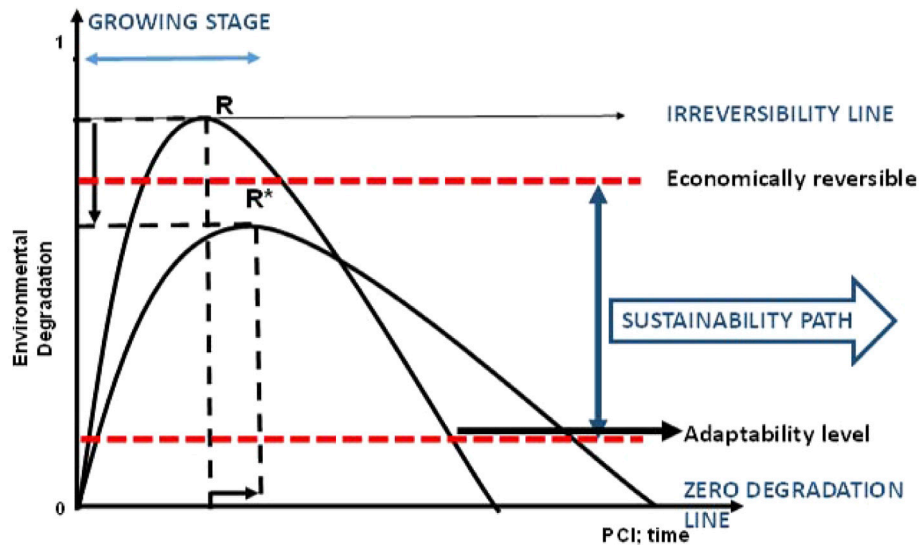


The Adaptability Principle

Every living thing has limits in facing environmental changes, which Letey, 1973 called “tolerance,” which underpins the adaptability principles. Humans can adapt to different extreme environmental conditions that change over generations. Many other living things such as plants and animals also adjust to different situations, including toxic ones (Letey, 1973) and extreme environments of warming and cooling temperatures. Thus, the concept of sustainability should not (always) mean exactly bequeathing natural resources such as the current state of the generations to come. Likewise, the idea of restoration does not have to be interpreted as restoring conditions to an “original” ecosystem because: first, there is no definition of time considered as the original natural state, and second, human beings and other living things may have adapted to new environments and new human-environment relations, so that restoring environmental conditions can even have the potential of presenting new dangers.

The film “*Jurassic Park*” describes a powerful critique of people who seek to restore prehistoric beings on Earth. Successfully reviving dinosaurs, in this case, can create dangerous new ecosystems for other species and human life. Thus, the concept of sustainability should be seen in the context of the human and other living things’ ability in the present situation to adapt to environmental changes. Sustainability is a dynamic concept whose conditions may differ according to the context of time and place. Therefore, restoring the environment does not have to become a “zero environmental degradation” principle. Environmental recovery needs to be carried out up to the limits of natural adaptability (Figure 2).

Many of these questions of environmental change are at the forefront of our understanding and policies around climate change. Climate change results in environmental change at time scales that challenge the notions of irreversibility and adaptability. Thus, many aspects of adaptation should be integrated with mitigation in forest and environmental policy, both at the national and local levels (Di Gregorio et al., 2016; Nurrochmat et al., 2020; Nurrochmat et al., 2021). In this context, restoration for climate mitigation needs to be done at the limit of humans to adapt and not necessarily exceed reasonable social costs. The calculus of this has changed with the increasing



Notes: R = Return point, PCI = Per Capita Income

Source: Nurrochmat *et al.* (2016a), modified

FIGURE 2 | The Concept of reversibility and adaptability in environmental management policy strategies.

immediacy of the detrimental effects of climate change. For this reason, restoration must also consider species adaptation alongside the adaptability of the surrounding social environment. Replacing the existing vegetation with native species or restoring the state of initial vegetation is not always necessarily appropriate to carry out in search of sustainability principles—in terms of ecological, social, economic, technological, and legitimacy aspects (see Ekayani et al., 2015; Sukwika et al., 2016; Nurrochmat et al., 2017; Yovi and Nurrochmat, 2018; Rahmani et al., 2021).

GLOBAL FOREST-REGIMES, NATIONAL POLICIES, AND LOCAL INTERESTS ON SUSTAINABLE DEVELOPMENT

The strategy for managing forest and environmental resources must be in line with the norms of environmental management and social and economic rationality. In some cases, global regime intervention is an obstacle in implementing the best forest resource and environmental management policy (see Nurrochmat et al., 2016a; Erbaugh and Nurrochmat, 2019). Therefore, land and natural resources management strategy should always consider the principles of people's prosperity and national sovereignty, which relies on national and local interests (Pribadi et al., 2020; Nurrochmat et al., 2021).

Not all policies outlined by the government manifests as a reality in the field. In particular, the issue of legality is not always congruent with legitimacy. For example, many regulations attempt to determine forest management outcomes. Still, too many regulations are being violated or deemed illegitimate at

different governing scales or other notions of authority. Legitimacy starts with trust in someone or something. Credibility, efficiency, and fairness will be enforced if the implementation of policies is in line with the corresponding characteristics and purposes.

International regimes, especially in the forest sector, influence national legal systems. The hegemony of interpretations of interest groups or certain countries on forest boundaries impact the selection and application of policy strategies and benchmarks for the sustainability of forest resources and environmental performance (see Giessen 2013; Nurfatriani et al., 2015; Sahide et al., 2015, 2015a; Nurrochmat et al., 2016a). In choosing a strategy for environmental policy management, in addition to paying attention to economic linkages, leakages and effectiveness must also be considered (see Nurrochmat et al., 2016b; Sherifdeen et al., 2020).

The case of oil palm plantations expansion is salient. On a local or national scale, there may be some examples that oil palm causes deforestation, but these dynamics are very different (see Sahide et al., 2015; Nurrochmat et al., 2021). The environmental benefits of oil palm plantations are never equal compared to natural forest ecosystems, and therefore, comparing these two conditions is irrelevant. A much fairer comparison is the benefits and environmental damage caused by various world vegetable oil-producing plants when seen from a broader context. The world's demand for vegetable oils continues to grow. This market is contested by different vegetable oils derived from oil palm, soybeans, rapeseeds, sunflower seeds, and several other vegetable oils (World Growth, 2011). Suppose vegetable oil production from palm oil is halted and substituted by soybean oil, rapeseed, or sunflower seeds whose productivity per land area is only about

one-tenth of palm oil (Palm Oil Research, 2017). What are the implications for global deforestation and market demands for vegetable oils? It is by no means an endorsement of palm oil over others, given the different ecologies and economies for which these agricultural products are produced. Instead, this article is trying to highlight the broader context of forest management and sustainability at differing scales of governance.

Contestation of interests has not necessarily created a conflict (Roslinda et al., 2012; Budiono et al., 2017; Astuti et al., 2020). Nurrochmat et al., 2017 promote a concept of changing contestation into collaborative management of forest resources and the environment. Actors or groups of actors each have different interests in resources and the environment. It is impossible to generalize all actors' diverse interests at the global, national, and local scales in natural resource management (see Pribadi et al., 2020; Nurrochmat et al., 2021). However, it is possible to identify the slices of various interests by exploring the intrinsic interests of each actor—which cannot be determined from the question of what the actors are doing. Instead, it becomes evident of they have done or are doing. A land-swap policy may be an excellent example for compromising interests and goals in local and national development (Nurrochmat et al., 2020).

DISCUSSIONS

Sustainable forest development can be implemented effectively if and only if a more appropriate sustainability standard is normative and more reasonable, measurable, and implementable. The condition of “sustainability” in natural resource management is thus limited by the ability of nature to recover and the human ability to adapt, which will form a new

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dimension of human-nature relations in future generations. Therefore, sustainability should not be defined as transferring resources and the environment to future generations with the same conditions as the initial ones. The situation should be based on what enables future generations to adapt and create ways that allow for a better quality of life.

It concludes that the successful implementation of a forest development policy is also largely determined by the rationality of socio-economic-ecological arguments. The rationality is often measured by the benefits received by a particular community, generally determined by the level of legitimacy of a particular policy rather than its legal aspects. The different interests of actors in managing forest resources do not always cause conflict. Identifying the intrinsic interests of various actors in managing resources and the environment is the key to shifting potential conflicts and transitioning them into opportunities for cooperation and legitimate consensus. Thus, it is imperative to improve the green policy paradigm by considering the principles of reversibility, adaptability, rationality, and legitimacy.

AUTHOR CONTRIBUTIONS

DN discussed the concept; DN collected data and contributed to the analyses; DN and MF drafted the manuscript; DN, MS and MF contributed to revising and refining it.

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