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EFFECTIVENESS

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Effectiveness is defined as the degree of improvement in environmental performance (impact) that can be causally attributed to governance, for example by way of international treaties, international **regimes**, domestic policies, or international **nonregimes**. While often confused with **compliance and implementation**, the various concepts point to different aspects. Compliance and implementation refer to obligations taken on by parties to a treaty or unilaterally in view of domestic audience costs—which may or may not have effects on environmental performance. Global environmental politics may even have effects in the absence of an international regime (e.g. if a nonregime induces domestic politics to undertake actions nationally that eschew international cooperation) or when international regimes may have effects on non-members. Effectiveness as the improvement of environmental quality or reduction in pollution loads may occur for reasons, inter alia, of international policies, uncoordinated national policies, the coordination of national and international policies, technological change, or lifestyle changes.

How can we measure effectiveness? In the absence of any policy, we can only take observations of the environment, using chemical, physical, social, political, or welfare measures to characterize the state of the environment and potential changes over time. Most common among social scientists is the interest in the ex post or ex ante *effects* of specific policies on environmental quality, such as specific pollution reduction policies at different **scales** (the domestic, regional (e.g. Asian or European) or international levels), changes in land use (e.g. designation of nature

protection areas), or **adaptation** measures (e.g. building dams to prevent flooding in coastal areas due to the threat of sea-level rise). In the environmental field, policies often take a considerable amount of time to demonstrate an unequivocal break with the past, thereby demanding a sufficiently long time frame for **assessments**. In addition, the policy must be causally related to the effect to afford appropriate attribution. This is captured by the attention that needs to be placed on counterfactual reasoning, i.e. the environmental performance witnessed in the absence of a particular policy or a range of policies. Effectiveness can be measured at the output, outcome, or impact level. Measurement at the impact level best captures environmental effectiveness. As a second best solution, outcomes that are causally related to impacts should be considered, for example changes in pollution levels.

The Oslo-Potsdam Solution has served as a benchmark concept to measure the effectiveness of global, international, and EU policies. Building on Underdal (1992), Sprinz and Helm (1999) and Helm and Sprinz (2000) developed a synoptic approach (Hovi et al. 2003a). At the outset, a dimension (e.g. pollution levels or an environmental quality index) has to be chosen that is causally linked to environmental quality. Subsequently, three components have to be located on this dimension: (1) the non-policy counterfactual in the absence of the policy (lower bound); (2) the pollution level actually associated with a specific policy; and (3) the collective optimum of an ideal (counterfactual) policy performance (upper bound). If the distance traveled from the no-policy counterfactual to the actual policy (2–1) is divided by the potential for improvement of the environment (collective optimum minus non-regime counterfactual, 3–1), a simple effectiveness score can be computed, ranging from zero to one (Helm and Sprinz 2000). The Oslo-Potsdam Solution to measuring regime effectiveness has proven useful in a range of applications in research on environmental policy as well as in other fields of international studies (e.g. Grundig 2006) and has enjoyed a range of extensions.

To date, the Oslo-Potsdam Solution is the only numerical solution to measuring the effect of international treaty regimes and EU policies (both aggregate and country-specific effects), but could easily be used in the context of nonregimes (to elucidate whether these have effects), domestic policies, or multiple dimensions (necessitating a procedure of aggregation across dimensions). The Oslo-Potsdam Solution has received fruitful criticism by the scholarly community. A friendly exchange between the proponents of the Oslo-Potsdam Solution and Oran Young (Young 2001, 2003; Hovi et al. 2003a, 2003b) clarified

a range of opportunities and shortcomings of the Oslo-Potsdam Solution.

Empirically, the early regulations under the **transboundary air pollution regime** have received the strongest attention in terms of effectiveness assessments. Depending on the method chosen, the early sulfur and nitrogen protocols have generated only mild to medium effects on environmental quality, thus leaving substantial scope for improved policy design (e.g. Helm and Sprinz 2000). Recent research showed benign effects of (1) the EU on member countries during the first compliance period under the Kyoto Protocol on climate change as well as (2) legally binding (compared with legally nonbinding) international agreements on European water quality (Avrami and Sprinz 2019; Köppel and Sprinz 2019).

Perhaps the most heralded global environmental agreement is the **ozone regime** (Montreal Protocol and amendments) on substances that deplete the stratospheric ozone layer. Since 1980, ozone-depleting substances have been reduced very substantially, yet recovery to 1980s levels is not foreseen before the 2060s.

The **climate change regime** on greenhouse gas mitigation and especially its 2015 Paris Agreement will hopefully witness a similar trajectory.

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EMERGING COUNTRIES

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In 1981, Antoine van Agtmael coined the term "emerging markets," in contrast to the "third world" concept. His idea was to point at the fact that several developing countries were in a period of transition, performing better economically than the rest of the South. According to the International Monetary Fund (IMF), the top ten emerging markets in 2018, therefore before the Coronavirus crisis which is likely to change the game were China, India, Brazil, Russia, Mexico, Indonesia, Turkey, Thailand, South Africa, and Malaysia. Some of these countries perform very well economically, but they also face social priorities (with low human development indexes) and are laggards with regards to environmental performance. Emerging countries therefore have mixed characteristics and challenge traditional concepts such as the North–South divide.

Emerging countries are considered rich in terms of biodiversity resources (Orsini and Nakanabo Diallo 2015), or megadiverse—as they host most of the world's biodiversity—and have traditional populations that own important knowledge that biotechnology companies can turn into commercial applications (pharmaceuticals, cosmetics, etc.). But they are also large polluters, the fastest growing greenhouse gas emitters and are vulnerable to natural **disasters** due to serious social problems and lack of **adaptation** policies. One should keep in mind that more