

The twofold approach for measuring climate change adaptation costs: current spending and the costs of implementing the national adaptation strategy in Austria

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Introduction

Along with the implementation of the Paris Agreement, countries and international institutions – such as the United Nations, the World Bank or development banks – seek to advance mitigation and adaptation by increasing related spending. The European Commission for example stipulates that 20% of the European Structural and Investment Funds (ESIF)'s budget 2014-2020 shall be spent on climate-related actions [1]. However, despite this political interest in adaptation spending, there is little agreement on suitable tools and methods for tracking adaptation expenditures at the national level in a systematic and valid, yet also cost- and time-effective way. The challenges involve that it is unclear what counts as adaptation and what expenditure share of a specific action is attributable to adaptation. We therefore propose a method to assess today's public spending on climate change adaptation and illustrate this method for the case of Austria. We focus on the federal level including all adaptation actions that are undertaken or motivated by the federal government. With Austria having implemented a national adaptation strategy in 2012, the additional difficulty emerges that current expenditures already contain adaptation actions, that actions of the adaptation strategy are partly implemented, and that adaptation actions are undertaken which cause costs but are not part of the adaptation strategy. Our approach is therefore twofold: (i) screening the public budget for adaptation-relevant spending (top-down approach); and (ii) costing the specific measures of the adaptation strategy and aggregating these costs (bottom-up approach).

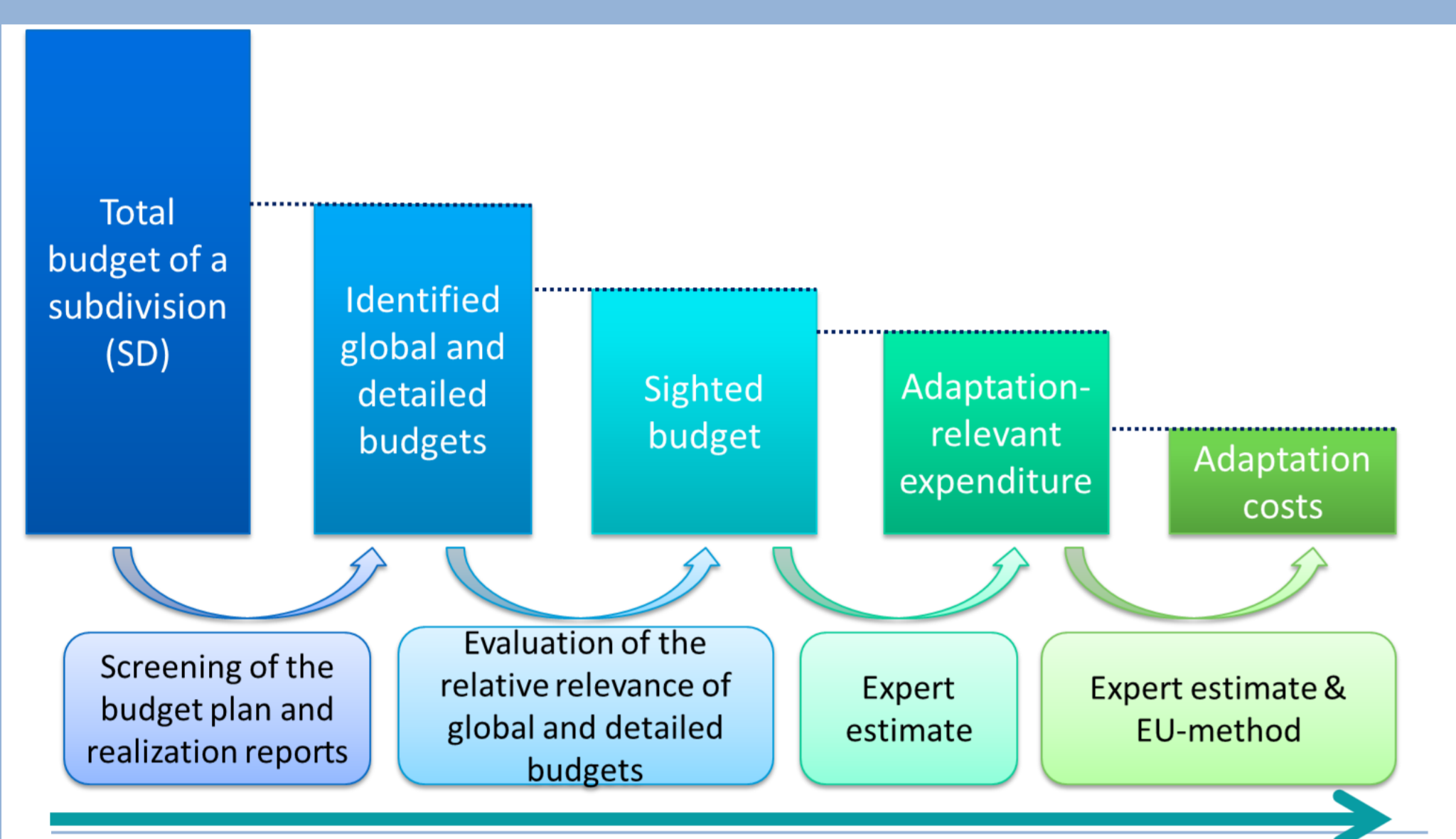


Figure 1. Graphical depiction of the methodology for the top-down approach.

Method

Expert interviews are used (i) to identify adaptation-relevant expenditures and adaptation cost shares thereof, (ii) to estimate adaptation costs for the measures of the adaptation strategy, and (iii) to map these measures to the expenditures in the current budget. To estimate federal expenditures on adaptation for different categories of the Austrian overall budget, we employ two methods: (i) a **top-down** approach based on the federal government's budget plan and realization report 2016 (remitted funds in 2014); and (ii) a **bottom-up** approach based on the specific measures of the Austrian strategy for adaptation to climate change. The **top-down** approach seeks to find out which federal expenditures are adaptation-relevant and what shares thereof are adaptation costs (Figure 1). It builds on OECD DAC Rio markers for adaptation [2] and the EU common methodology [1] and combines them with results from interviews with ministerial officials. The aim of the **bottom-up** approach is to identify which costs are caused by implementing the adaptation measures of the Austrian national adaptation strategy, and considers current costs of adaptation measures that are listed in the strategy and are funded by the federal government.

Results

In 2014, adaptation-relevant expenditures in the departments of agriculture, forestry and water management (SD 42), environment (SD 43) and transport, innovation and technology (SD 41) amounted to € 2.1 billion including climate change adaptation as primary and secondary goal, according to the **top-down** approach (see Figure 2). Considering only the share that constitutes adaptation explicitly, an amount of € 488 million. Figure 3a shows how these costs are distributed across activity fields as well as costs for other measures that support adaptation, but are not included in the Austrian national adaptation.

According to the **bottom-up** approach, the aggregation of current costs of adaptation measures that are listed in the Austrian adaptation strategy and are funded by the federal government, average annual adaptation costs amount to € 385 million (with a range of variation from € 286 million to € 485 million) (see Figure 3b). It is important to note that several measures are not yet fully implemented, which means that increasing effort might come along with higher costs.

The adaptation cost estimates correspond to 6% (bottom-up) or 8% (top-down) of total expenditures on SD 41-43, and are of equal magnitude as federal disaster fund payments for losses to private property (€ 398 million in 2014) and half as much as the environmental expenditures of the federal government (€ 962 million).

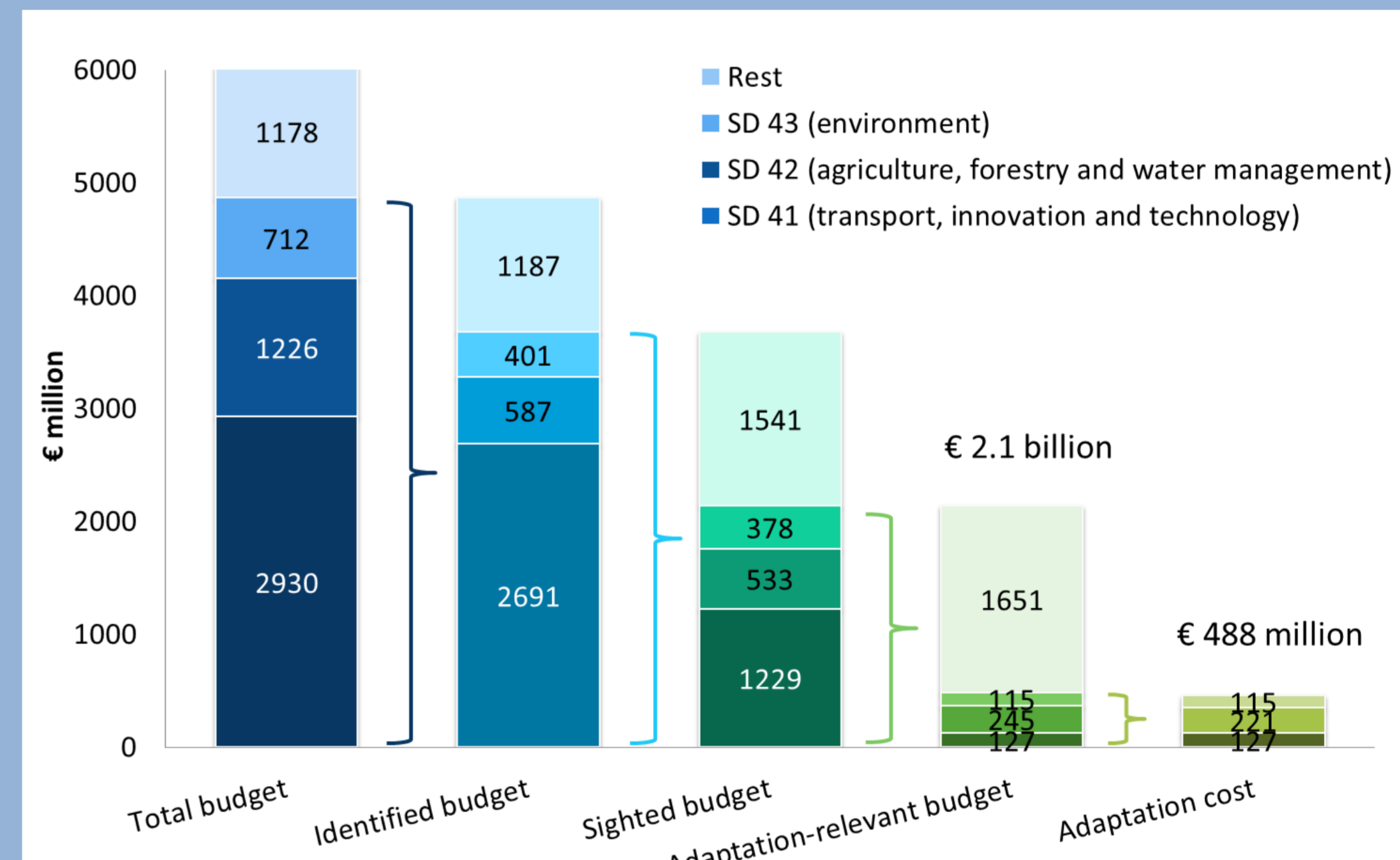


Figure 2. The top-down method backed with numbers.

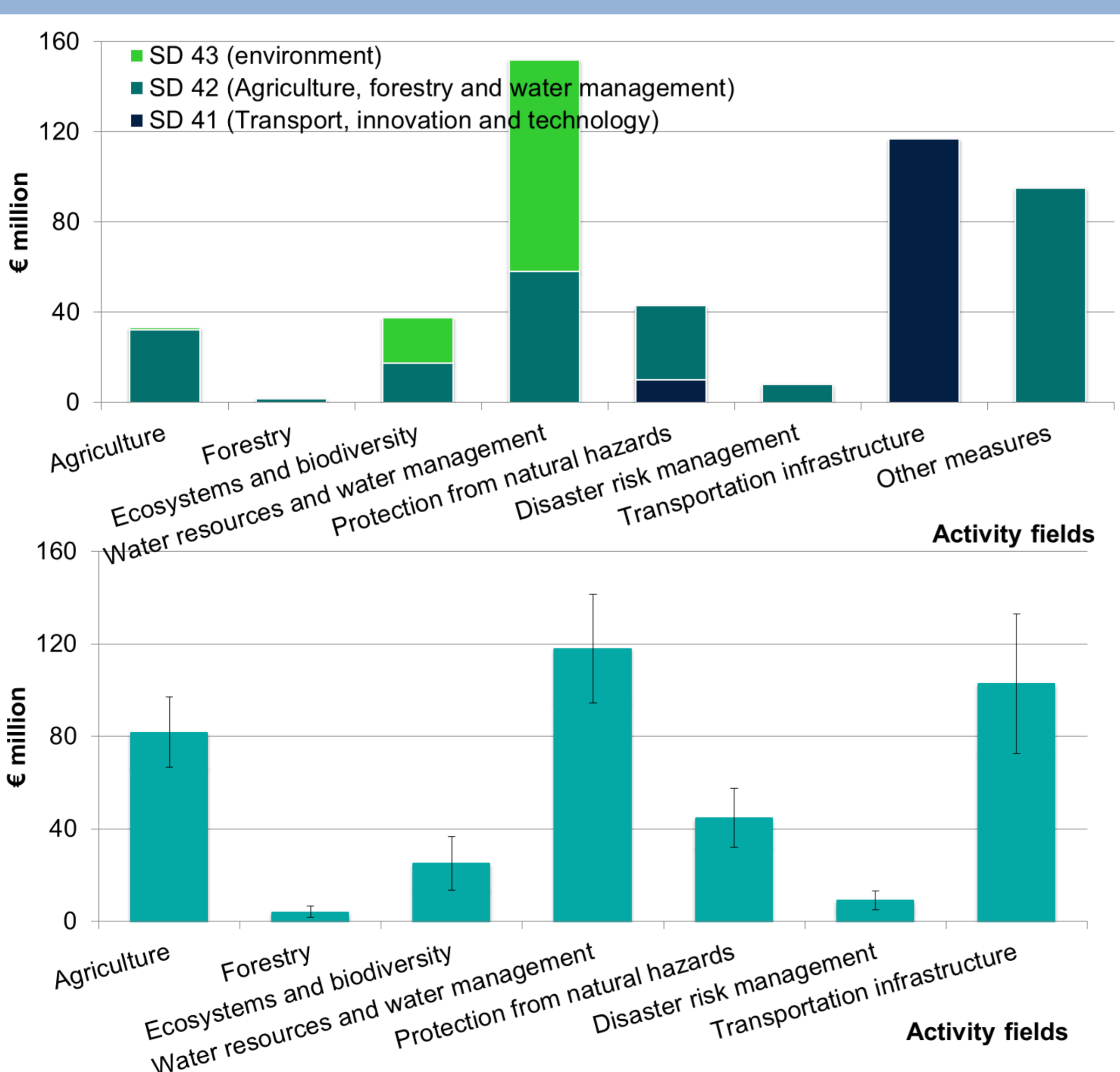


Figure 3. a) Annual adaptation costs in SD 41 (transport, innovation and technology), SD 42 (agriculture, forestry and water management) and SD 43 (environment) for activity fields in € million (2014), top-down approach. b) Annual adaptation costs for activity fields in € million (today), bottom-up approach.

Conclusion

None of the two approaches is more correct to measure adaptation expenditures than the other one, since they both cover different but still relevant aspects of adaptation (see Table 1): while the top-down approach covers all adaptation activities that are currently implemented by the federal budget, the bottom-up approach only accounts for those activities that are part of the Austrian adaptation strategy. However, due to the mainstreaming of adaptation in many policy areas, it is important to keep in mind that also the cost part which was identified as non-adaptation relevant has to be financed. Spending just the adaptation-relevant part is likely to generate a lower level of adaptation than intended. In any case, we conclude that the suggested approaches are more valid and accurate than existing methods to track adaptation expenditures.

	Top-down approach	Bottom-up approach
Coverage of adaptation measures	Partially (those that are in the competence of the federal government)	Complete (according to their status of implementation)
Additional adaptation-relevant spending	yes (for example flood protection measures)	no
Annual adaptation-relevant expenditures (today)	€ 2.1 billion	-
Annual adaptation costs (today)	€ 488 million	€ 385 million

Table 1. Differences between top-down and bottom-up estimates.

[1] European Commission (2016), Tracking climate expenditures. The common methodology for tracking and monitoring climate expenditure under the European Structural and Investment Funds (2014-2020), European Commission, Brussels. Available online: https://ec.europa.eu/clima/sites/clima/files/docs/tracking_climate_expenditure_en.pdf

[2] OECD Development Assistance Committee (2016), Definition and Guidance for the Rio Markers. DCD/DAC(2016)3/ADD2/FINAL.