

General comment:

For an article that aims - to provide guidance for the design and implementation of adaptation policies in European basins, the question is posed: why is existing legislation not considered? Also, strategies and plans prepared for coastal management and adaptation are missing.

As for the legislation, the question is primarily related to the ICZM Protocol of the Barcelona Convention, which is the only regional legal text in the world inviting countries to establish a setback zone (Article 8) – a low-regret measure for the rising sea level. EU has ratified the ICZM Protocol, and by that ratification, the Protocol became part of European Union law.

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A22009A0204%2801%29>

In addition, the Protocol, in its article 18, invites Mediterranean countries to prepare national ICZM Strategies, coastal plans and programmes. All strategies, plans and programs developed since the Protocol entered into force were focused on adaptation to the changing climate within its commonly applied integrated approach. Within the extensive scientific and grey literature reviewed (including 206 items), none of the UNEP/MAP, PAP/RAC documents have been considered. Although ClimateAdapt is considered, [AdriAdapt](#) is not.

Comments per lines

Lines 105 and 600 Setback has not been included as the measure, although it is among the most effective low-regret measures in general.

Lines 100-120 and 185

One of the accommodation measures is the establishment of a setback zone. This measure is requested by the Protocol on ICZM in the Mediterranean, the world's first regional legislation for coastal management. Article 8 of the Protocol on "*Protection and sustainable use of the coastal zone*" invites Mediterranean countries to limit new constructions and the coastal linear extension of urban developments and transportation through the provision of coastal setback zones^{1,2,3}. The delimitation of these zones must be at least 100 m in width, taking into account the highest winter waterline and the areas directly and negatively affected by climate change and natural risks. Several EU countries have setback regulations within their national coastal laws (e.g., France and Spain), and some within spatial planning law (e.g., Croatia). In Italy, the coastal setback zone, as a method for coastal risk reduction, is proposed as an effective integrated strategy for future coastal planning in the Italian region of Emilia-Romagna^{4,5}. Coastal setback zones provide coastal protection by reducing

¹ UNEP/MAP/PAP. (2008). Protocol on Integrated Coastal Zone Management (ICZM) in the Mediterranean. Split, Priority Actions Programme.

² PAP/RAC. (2021). *Coastal Resilience Handbook for the Adriatic*. INTERREG AdriAdapt project, Split. <https://adriadapt.eu/wp-content/uploads/2022/01/Coastal-Resilience-Handbook-for-the-Adriatic.pdf>

³ Ocean & Climate Platform. (2022). Adapting Coastal Cities and Territories to Sea Level Rise in the Mediterranean Region: Challenges and Best Practices. Ocean & Climate Platforme. 48 pp.

⁴ Perini, L., Calabrese, L., Salerno, G., Ciavola, P., and Armaroli, C. (2016) Evaluation of coastal vulnerability to flooding: comparison of two different methodologies adopted by the Emilia- Romagna region (Italy), Nat. Hazards Earth Syst. Sci., 16, 181– 194, <https://doi.org/10.5194/nhess-16-181-2016>

⁵ Emilia Romagna Region. (2022). Strategia di Gestione Integrata della Costa ai cambiamenti climatici (GIDAC). INTERREG AdriaClim project. https://ambiente.regione.emilia-romagna.it/it/suolo-bacino/argomenti/difesa-della-costa/gidac/gidac-dicembre-2022/strategiagidac_documento_dic22.pdf

the number of assets (e.g. houses, infrastructure, and businesses) in areas susceptible to coastal hazards, which are expected to increase with climate change. In other words, they provide a buffer to coastal flooding and erosion.⁶ Coastal setback zones ensure open public spaces and access to the shoreline which increases the opportunity for the development of tourism, beach economy and recreational activities. Through the prioritisation of public services and activities, they improve the quality of coastal experiences among residents and tourists². Implementation of coastal setback zones secures space for ecosystems and for the creation of Nature-based Solutions. As such, they may also attenuate wave action. There are other benefits of implementing coastal setback zones related to additional ecosystem services, such as maintaining the water quality and allowing erosion and accretion cycles to occur naturally, thus retaining sediment budgets. Additionally, setback zones can have a multifunctional role, and be a part of the EU policy that promotes the use of [nature-based green and blue infrastructure](#), improving environmental conditions and mitigating negative effects of the built environments in cities.⁶

Finally, by limiting urban development in the short term, setback zones facilitate realignment in the long run. Studies have demonstrated the effectiveness of these setback zones in combination with coastal adaptation measures (i.e. managed retreat and protection) to reduce present and future costs of coastal flooding⁷. As regards the future sea levels, the size of buffer zones between structures and the sea will inevitably reduce, thereby compelling the periodical review of their delimitations to ensure they continue to provide sufficient protection³. This measure is increasingly being adopted among Mediterranean countries despite delays and exceptions which have permitted different developments⁸.

8 Integration of Climate change adaptation in coastal zone management plans and strategies Integrated Coastal Zone Management Plan of the Šibenik-Knin County, Croatia⁹
Coastal Zone Management Plan for the City of Kaštela, Croatia¹⁰
Coastal Plan of the Split-Dalmatia County, Croatia¹¹
National ICZM Strategy for Emilia-Romagna Region⁵

265 – 270 In addition, hard defences may also take different purposes, such as promenades, sunbathing platforms, roads, or parking places.¹²

⁶ <https://adriadapt.eu/adaptation-options/coastal-setback/>

⁷ Lincke, D., Wolff, C., Hinkel, J., Vafeidis, A., Blickensd Ärfer, L., Povh Skugor, D. (2020). The effectiveness of setback zones for adapting to sea-level rise in Croatia. *Regional Environmental Change*, 20(46). doi:10.1007/s10113-020-01628-3

⁸ Rochette, J., Du Puy-Montbrun, G., Wemaëre, M., Billé, R. (2010). Coastal setback zones in the Mediterranean: A study on Article 8-2 of the Mediterranean ICZM Protocol. IDDRI. Analyses 05/2010. https://www.iddri.org/sites/default/files/import/publications/an_1005_article-8-2-iczm-protocol.pdf

⁹ <https://iczmplatform.org//storage/documents/pEoju2FqfXjzPoYBLsKZiD3o6ONBXxJ44RTWFt7P.pdf>

¹⁰ <https://adriadapt.eu/case-studies/coastal-zone-management-plan-for-the-city-of-kastela-coastal-plan/>

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https://www.pomorskodobro.dalmacija.hr/DesktopModules/Bring2mind/DMX/API/Entries/Download?language=hr-HR&Command=Core_Download&EntryId=11315&PortalId=4

¹² <https://adriadapt.eu/adaptation-options/seawalls-and-quays/>