WP-EcoB04

15

30'

Note

This case study is inspired from a real case and uses real data. Relevant practical information is thus provided in the manual (source of data…). However, as it is intended as an interactive presentation, it is recommended to ensure as much participation as possible rather than to deliver data directly.

COMMENTS

Key ideas

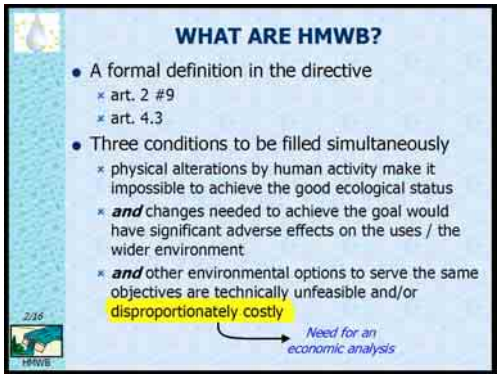
This slide provides the references of the WFD articles referring to HMWB and recalls the key aspects of the definition.

It is intended as a quick reminder of the concept before presenting the case study itself.

It is important to stress on the three cumulative conditions that determine the designation as HMWB: though disproportion of costs is essential, it is neither the only nor the first condition.

This demonstrates the need of integration between economic aspects/experts and the others (hydrology, biology, etc.).

Go further



YOUR NOTES

COMMENTS

Key ideas

The flow chart applies to water bodies identified as unlikely to reach the good ecological status by the 2015 deadline, on the basis of the 2004 characterisation. The designation process is a two-step one:

- determination of the potential significant adverse effects of the measures required to reach the goal;
- if such effects are identified, examination of alternatives to the existing changes in 3 successive sub-steps (technical feasibility, environmental impact, cost).

Nota

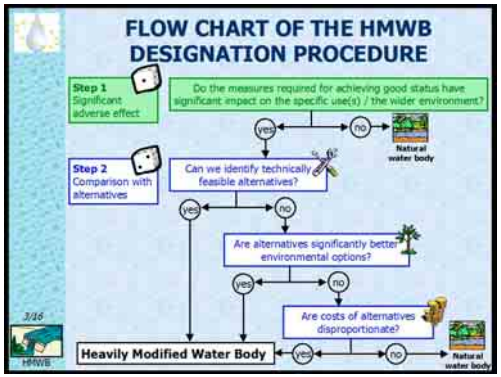
i- there is no formal schedule for the designation of HMWB. According to the WATECO and HMWB guidance documents, it shall be done between the 2004 characterisation and the publication of the first draft of HMWB (2008), so that public participation can take place.

ii- icons appearing on the flow chart will be used in the following slides to allow trainees to always identify the stage of the procedure being presented: dices for steps 1 and 2; pictures for sub-steps of step 2 (tools for technical feasibility, tree for better environmental options, money for disproportionate costs).

Go further

Guidance documents (main text, accompanying documents) "*Economics and the environment*" (working group 2.6) and "*Identification and designation of heavily modified and artificial water bodies*" (working group 2.2)

http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents&vm=detailed&sb=Title



YOUR NOTES

COMMENTS

Key ideas

Identification on the virtual district map of the water body to which the case study refers: a dam.

Note

This case study picks up many elements from the Haringvliet case (NL).

Factual and descriptive information is provided all along the manual to allow a concrete description of the case. As the goal is to make it as interactive as possible, trainees should be involved in the analysis of the different stages of the designation procedure.

Full description of the real Haringvliet case is available online.

Go further

"*Heavily modified waters in Europe - Case study on the Haringvliet estuary*"

http://www.sepa.org.uk/hmwbworkinggroup/Case-studies/Netherlands/haringvliet.pdf

33 other European case studies on the designation of HMWB are also available

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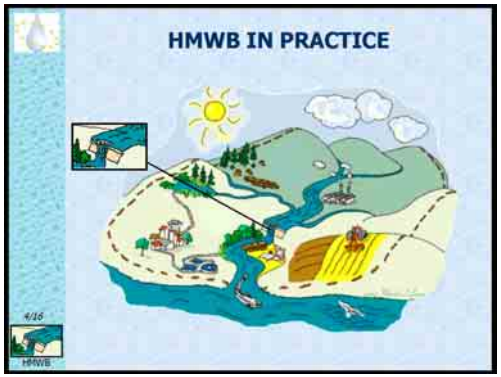


YOUR NOTES

COMMENTS

Key ideas

Initial description of the case

i- **Objectives served**: the dam was built in 1970 with flood protection as a foremost important motive. Since then, with the subsequent creation of a fresh water lake, water supply has become the second main objective served by the dam, as intense urbanisation pressure arose, creating a pressure on land for agriculture and a need for more dikes.

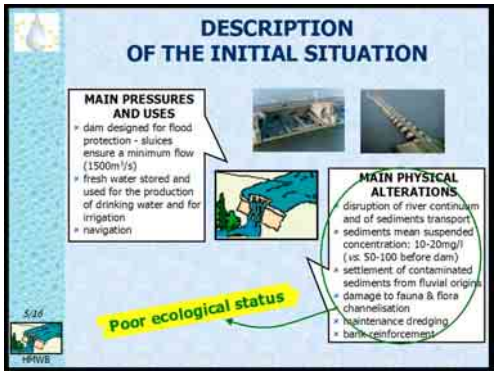
ii- **Brief description of the dam**: sluices in the dam are operated to ensure a minimum flow (1500m^3/s). It is closed during high tides to prevent salt water to enter.

iii- **Activities**: major economic activity in the catchment is agriculture. There is also some industry and commercial fishing.

iv- **Status of the water body**: given the uses and the pressure they create, it is considered that the ecological status is poor due to important physico-chemical alteration (disappearance of estuarine salinity gradient, high levels of contaminants: Cu, PAH…, development of contaminated sediments, etc.) and to poor biological situation. Sediments require special attention: although on the one hand their mean suspended concentration is now much lower (10-20 *vs.* 50-100mg/l), high amounts of highly contaminated sediments from fluvial origins now settle on the bed of the lake.

It is questionable a)whether even with severe mitigation measures GES can ever be restored b)to which extent such measures will be possible given the multiple uses undertaken.

Given this context, the water body is identified as potential HMWB and may be subject to the specific designation procedure.



YOUR NOTES

COMMENTS

Key ideas

Given the serious pressure the water body is subject to, 4 major changes would be needed simultaneously in order to reach the good ecological status.

Two sets of measures likely to ensure these changes can be designed:

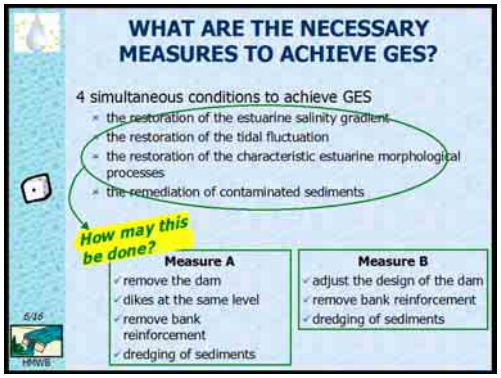
- radical measures: a)physical destruction of the dam, b)removal of the bank reinforcement and fixation to obtain a natural transition between the river and the riparian zone, c)dredging of contaminated sediments;
- less radical measures: a)adjustment of the design of the dam by lowering the barrier between the saline and freshwater to restore the characteristic estuarine morphological processes, b)removal of the bank reinforcement and fixation to obtain a natural transition between the river and the riparian zone, c)dredging of contaminated sediments.

It is important to note that measures listed here are dedicated at reaching the GES environmental objective which is the only concern at this stage. Fundamental objectives served by the dam are not considered in designing the potential measures.

Note

The dice in the margin refers to the first step of the designation process.

Go further



YOUR NOTES

COMMENTS

Key ideas

Examination of the adverse effects of the potential two measures on the objectives served by the dam is essential in order to determine whether GES may be achieved without (too) serious impact on the uses. If not, the formal HMWB designation process will be launched.

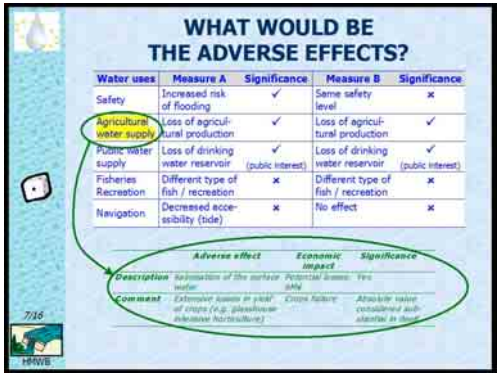
Here, several uses would be affected by the measures. Detailed information is provided here in order to allow discussion with trainees and/or to give opportunity to develop different simulations.

i- **safety**: dikes at present size and no dam (measures A) are not enough to guarantee the required and present level of safety. Safety would not be affected with measures B.

ii- **agricultural water supply**: focus is put here on this aspect. Some concrete elements and figures are provided to argue for the significance of the adverse effects. The potential economic impact is not precisely determined and only absolute value is used. Although it would be more consistent to use relative value (e.g. compared the figure with annual income of the sector), it is considered that the potential losses are high enough to be qualified as substantial without comparison. The impact of measures on this use is thus considered to be significant.

iii- **drinking water supply**: salinisation would make at least 1 abstraction point unusable. As it is drinking water supply, impact should be considered significant, at least from a public interest point of view.

To be continued on next page…



YOUR NOTES

COMMENTS (CONTINUED)

Adverse effects on other uses would also appear. However, they are only described here and their significance is not precisely estimated both because significance of adverse effects on the first three objectives has been demonstrated and because it seems that the effects may not be significant.

Besides, as the scale of the effects on such uses is more finely balanced, their significant character should be decided following a discussion with relevant stakeholders. A qualitative assessment of the impacts on the use should also be carried out.

iv- **fisheries**: changes in fishes populations due to migration from and to the sea would requires changes in methods for commercial fishing industry. Ten commercial companies are currently active and generate a turnover of 0,7M€/year. Increase in tidal movement would also reduce the access to some sport fishing locations.

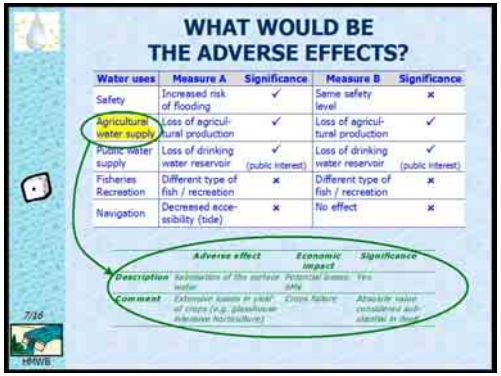
v- **recreation**: lowering of low-tide water level will make yacht basins less accessible… but more natural character of the waters may also make the area more appealing.

vi- **navigation**: low and high tide levels may create several problems: access to ports, passage under the railway bridge…

vii- **other uses**: potential impact for industry (lower low water level) and for agriculture outside the dikes (salinisation).

Note

When possible, relative values are preferred as they allow better estimates. For example, a reduction of an irrigated area by 100 ha can be considered as significant as compared to a total irrigated area of 105 ha, but not significant as compared to a total area of 120.000 ha. It is thus important to identify precisely the scale of the use to be considered.



YOUR NOTES

COMMENTS

Key ideas

This is only an informative slide to indicate that WATECO Guidance provides templates that can be useful in the HMWB designation process: see Accompanying document to the Guidance, p. 202 (annex IV.II(b)9).

Other forms and tables used in other case studies carried out in the frame of the HMWB working group may also be considered.

Go further

Guidance documents (main text, accompanying documents) "*Economics and the environment*" (working group 2.6)

http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents&vm=detailed&sb=Title

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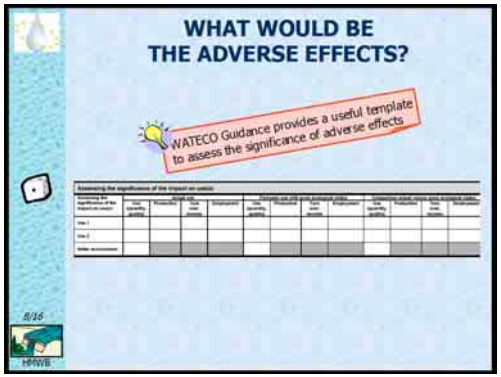


YOUR NOTES

COMMENTS

Key ideas

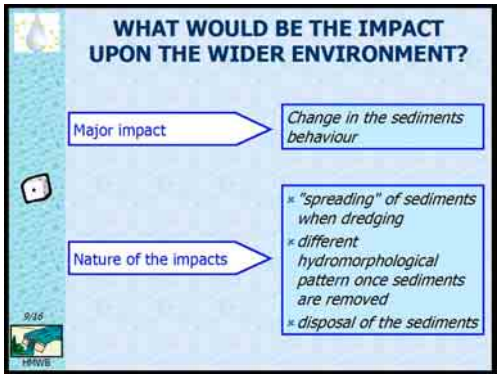
Potential measures allowing to reach the GES also have to be considered with regards to their impact upon the wider environment.

Here, focus is put on the sediment question. Indeed, the dam has generated the development of 32 Mm^3 of a highly contaminated fine-grained sediment layer. Though to different extent, potential measures would thus raise environmental questions both directly (local "spreading" of sediments when dredging) and indirectly (disposal of the contaminated sediments).

It is thus considered that measures would have a significant impact upon the wider environment.

Another form of impact on the wider environment could be that the removal of the dam may lead to the elimination of wetlands that have developed in connection to the water storage.

Go further



YOUR NOTES

COMMENTS

Key ideas

It has been demonstrated at the first step of the procedure that the measures that may potentially allow reaching the goal would have significant adverse effect both on the objectives served by the changes brought to the water body and on the wider environment (see slides 7 to 9).

It is then necessary to switch to the second step: the examination of other environmental alternatives serving the same beneficial objectives. It is first necessary to define the possible alternatives before examining them.

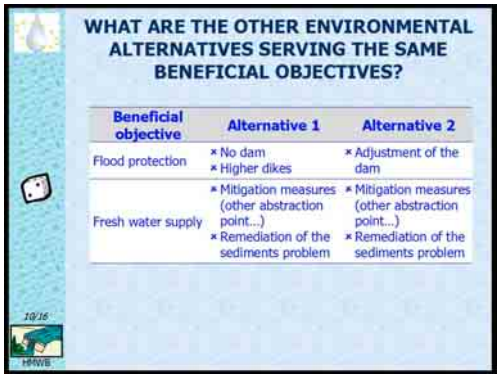
Here, two key objectives are targeted: flood protection and fresh water supply. Two alternatives are examined:

- alternative 1, the most radical one, is based on the destruction of the dam. Higher dikes and prevention plans would thus ensure flood protection. It is however questionable whether this option would ensure the present level of safety. Fresh water supply would be based on mitigation measures i.e. alternative provision, savings, etc.;
- alternative 2 is based on adjustments to the dam. Flood protection would thus be better ensured while fresh water stock would be at least partially safeguarded.

In both alternatives, sediment problem would require remediation. Salinisation also needs to be treated in order to ensure fresh water supply.

Note

Both alternatives are slightly similar to sets of measures A and B (see slide 6). However, alternatives not only aim at reaching GES but also integrate mitigating measures in order to ensure the same beneficial objectives as the changes already brought to the water body.



YOUR NOTES

COMMENTS

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Go further

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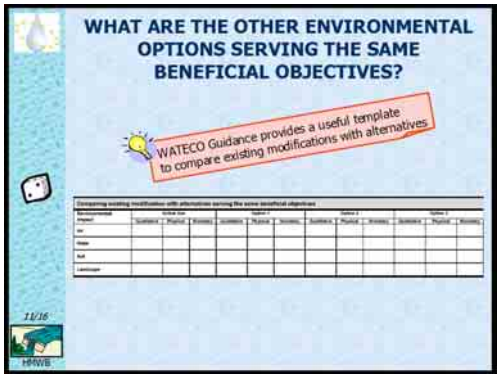


YOUR NOTES

COMMENTS

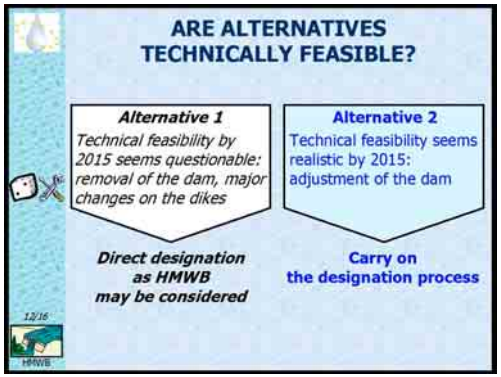
Key ideas

Examination of the technical feasibility of the alternatives is the first sub-step of step 2.

- alternative 1 is based on the destruction of the dam and on the development of the dikes. It seems seriously questionable as to whether such works may be finished by 2015. Thus, if alternative 1 is declared "technically unfeasible", the water body is designated as HMWB.
- alternative 2 appears technically feasible, although further study may be necessary to get more precise idea of the technical feasibility, as major works would be necessary to adjust the dam.

Although alternative 1 is not feasible, alternative 2 appears feasible. The HMWB designation process has to be carried on thus.

Go further



YOUR NOTES

COMMENTS

Key ideas

Examination of the environmental impact of the alternatives is the second sub-step of step 2. Only alternative 2 is examined here.

Once again, it is not obvious whether a clear answer may be given to the question at stake: is alternative 2 a significantly better environmental option than present changes?

Indeed, although it would bring a solution to the contaminated sediment problem, it may transfer the problem elsewhere at the same time as the disposal of the sediment raises serious environmental questions.

Further studies would also be necessary to determine precisely the environmental impact of the partial restoration of the characteristic estuarine morphological processes on water flow, on fauna and flora, etc.

As a consequence, open discussion with stakeholders may be necessary depending on the information provided by further studies.

In the case a negative answer is given to the question at stake, sub-step 3 must be taken. In the case of a positive answer, the water body is designated as HMWB.

Note

i- This sub-step involves looking at not only water, but also air, soils, biodiversity or landscape issues.

ii- As a first approach, a qualitative assessment of the main environmental issues is required. When possible, a quantitative assessment may be made.

YOUR NOTES

COMMENTS

Key ideas

Examination of the disproportion of costs of the alternatives is the third sub-step of step 2.

Identification of the costs and benefits is necessary first. Here, alternative 2 generates several economic costs (works, mitigation measures, etc.) and creates environmental benefit (achievement of GES).

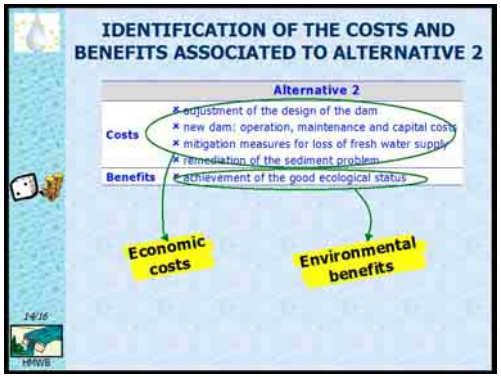
It is important to keep in mind that it may thus be difficult to make a valuable balance of costs and benefits as it may be difficult to award an economic value to the benefits (lack of data and/or of proxies, need for a disproportionate economic study, etc.).

Note

i- It is of course necessary to integrate maintenance and capital costs of the works.

ii- By simplicity, potential environmental costs (e.g. opportunity costs of the mitigation *measures as water transferred for local uses will not be available elsewhere) are not considered.*

Go further



YOUR NOTES

COMMENTS

Key ideas

After identification, costs can be assessed. Three possible approaches to assessing whether costs are disproportionate may be applied:

- comparison of costs of alternatives.;
- comparison of overall costs and benefits of modifications and alternatives;
- costs *vs.* ability to pay.

The choice may be made depending on the availability of data, on the costs required for further economic analysis, etc.

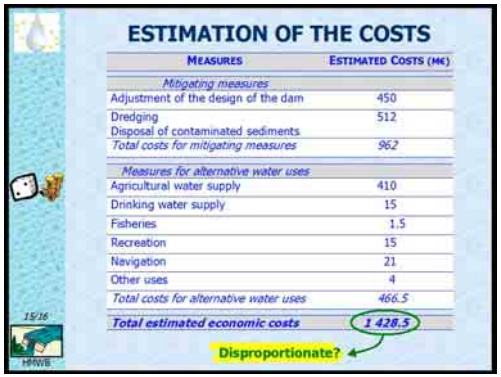
Here, only an estimation of the costs of alternative 2 is made, due both to the lack of precise data and to the fact that it seems possible to consider disproportion without undertaking further economic analyses. Indeed, it seems possible to discuss the disproportion of costs only on the basis of the estimated costs, as the amount is highly substantial (1428,5M€).

This phase is submitted to open discussion with all interested parties to question this aspect.

In the case costs are considered "disproportionate", the water body is designated as HMWB. If not, it is considered as a natural water body to which the 2015 goal applies.

Note

The disproportion is a case by case issue as it widely depends on local elements. It relies on a political decision, made on a transparent and opened basis: all elements of the procedure are available to the public.



YOUR NOTES