

Project summary

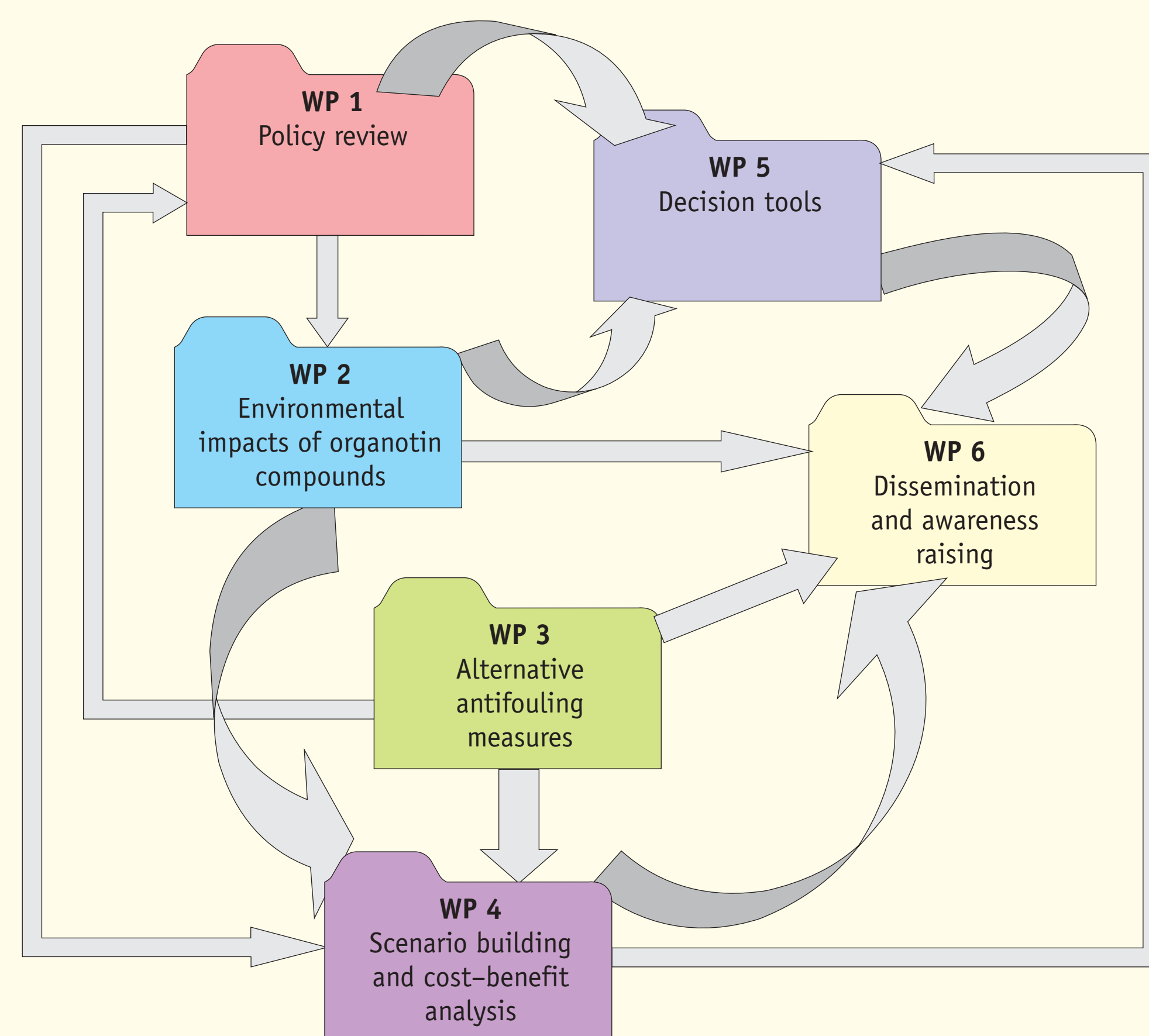
Antifouling paints are applied on the hulls of the ships and boats to control the growth of foulant organisms and to reduce their deleterious effects such as the slowing down of the ship speed, and increase in fuel consumption and maintenance costs. TBT (tributyltin) paints replaced copper-based paints due to a superior performance in terms of efficacy and duration. However, TBT has been described as the most toxic substance ever introduced in the marine environment. The high toxicity of TBT together with its tendency to be accumulated in marine organisms can result in heavy damage to marine organisms. The IMO (International Marine Organization) at a convention, approved of a resolution, which includes complete prohibition of organotin compounds in anti-fouling systems by 2008. Signatures of about 25 nations, whose combined flagged fleet equals 25% of the world fleet, are necessary for the convention to come into force. However, concerns have been raised that the hostility towards the use of TBT appears to be based on a very biased assessment. Environmental benefits of TBT have been ignored and little thought has been given to a technical rather than a legislative solution to control TBT input to the environment. Long-term biocidal properties of existing alternatives are largely untested as also their environmental impacts. The indicator used for determining environmental impacts such as imposex has been challenged by scientists. The project aims to study the implications of TBT pollution and ban on TBT along with the costs and benefits of TBT-based antifoulants and other alternatives. It also advocates alternative development of antifouling strategies and tools for monitoring and managing environmental impacts of organotin compounds. It further aims to develop a biomonitoring system to regulate TBT impacts that exist in coastal environments.

Project objectives

Broad objectives of the project are as follows.

- To assess the current policy concerns with regard to ban on using organotin compounds
- To assess the impacts of organotin-based and other existing antifouling paints on coastal environment
- To investigate alternative antifouling strategies
- To analyse costs and benefits of using organotin-based compounds
- To generate decision tools for better coastal health
- To create awareness and build capacity

Project overview



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AFS Convention

The problem of the release of TBT into aquatic environment and its environmental impacts were brought to the notice of the MEPC (Marine Environment Protection Committee) of the IMO. This led to the adoption of resolution that called on the MEPC to develop an instrument, legally binding throughout the world.

In October 2001, at the IMO headquarters, the International Convention on the Control of Harmful Anti-fouling Systems on Ships was adopted. Presently, twenty-five states representing 38.11% of world tonnage have ratified the convention. **The Convention will enter into force on 17 September 2008.**

Signatories to the AFS Convention are Antigua & Barbuda, Australia, Bulgaria, Cook Islands, Croatia, Cyprus, Denmark, France, Greece, Japan, Latvia, Lithuania, Luxembourg, Mexico, Nigeria, Norway, Poland, Romania, Saint Kitts and Nevis, Spain, Sweden, Tuvalu, Kiribati Slovenia, and Panama.

Annex 1: Control on antifouling system

Antifouling system	Control measures	Application	Effective date
Organotin compounds that act as biocides in antifouling systems	Ships shall not apply or re-apply such compounds	All ships	1 January 2003
Organotin compounds that act as biocides in antifouling systems	Ships either (1) shall not bear such compounds on their hulls or external parts or surfaces; or (2) shall bear coating that forms barriers to such compounds leaching from underlying non-compliant antifouling system	All ships (except fixed or floating platforms, FSUs (floating storage units), and FPSOs (floating production storage and offloading units) that have been constructed prior to 1 January 2003 and have not been dry docked on or after 1 January 2003)	1 January 2008

Impacts of TBT

In early 1970s, TBT-based antifouling paints were widely used on the ship hulls due to their superior performance in terms of efficacy and duration in preventing the growth of fouling organisms such as barnacles, mussels, oysters, and tubeworms. But soon their detrimental effects were reported on ecologically and economically important marine organisms.

Noteworthy impacts of TBT contamination are as follows.

- Imposex, that is, male sex characteristics, such as the development of penis and vas deferens, are stimulated to form on normal female gastropods
- Bioaccumulation of TBT in several marine organisms
- Shell calcification anomalies in adult oysters such as shell chambering and gel formation

