

# Design of Mobile, Water Recirculation Container for Live fish Transportation

*J.P.H. Kinyage*

DTU Aqua, National Institute of Natural Resources

## Abstract

Transportation of live fish requires continuous regular monitoring of good water quality status on parameters supporting survival such as  $O_2$ , and the one that impairs life such  $CO_2$ ,  $NH_4$ ,  $NO_2$  and  $NO_3$ , the by-products of fish respiration which continuous supply of fresh  $O_2$  or replacement of fresh water leading to discharge of deteriorated water which can be lethal to other organisms as it is to fish. In this Project, Application membrane filtration as advanced separation technology and water pump are used to design mobile container fitted with water recirculation system that will allow in-line treatment of waste water to reusable water from and to the fish container. A pump with a capacity of at least a head of 50 kPa is used to transport water from the tank to the treatment chamber in which a hydrophobic microfilter (MF) membrane polymer with  $0.5\mu m$  pore size is fixed ahead of biological digester with bioelements that help to trap organic wastes, the driving force of separation is pressure difference outside and inside membrane and concentration difference between waste water and reusable water. This container will be environmentally friendly and sustainable means of transportation of aquatic organisms where  $CO_2$ ,  $NH_4$ ,  $NO_2$  and  $NO_3$  are treated within the system resulting to reusable water for long term use with zero discharge.

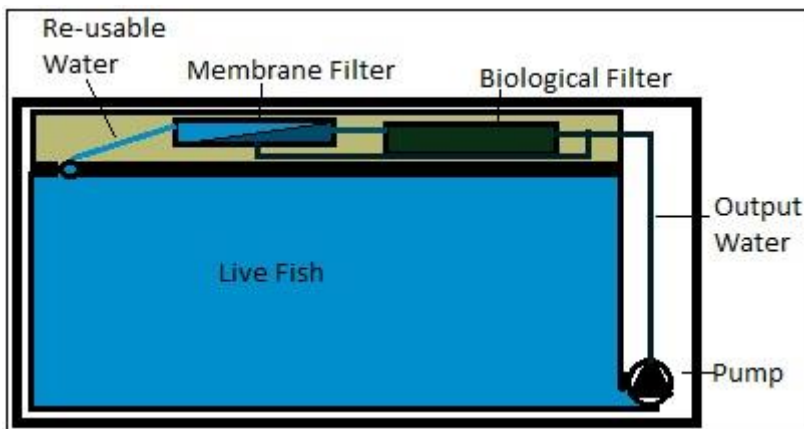


Figure Sketch of Mobile, water recirculation container systems  
(Diagram: J.P.H. Kinyage, 2014)

Key words: *Fish transportation, water recirculation, membrane separation, water quality*