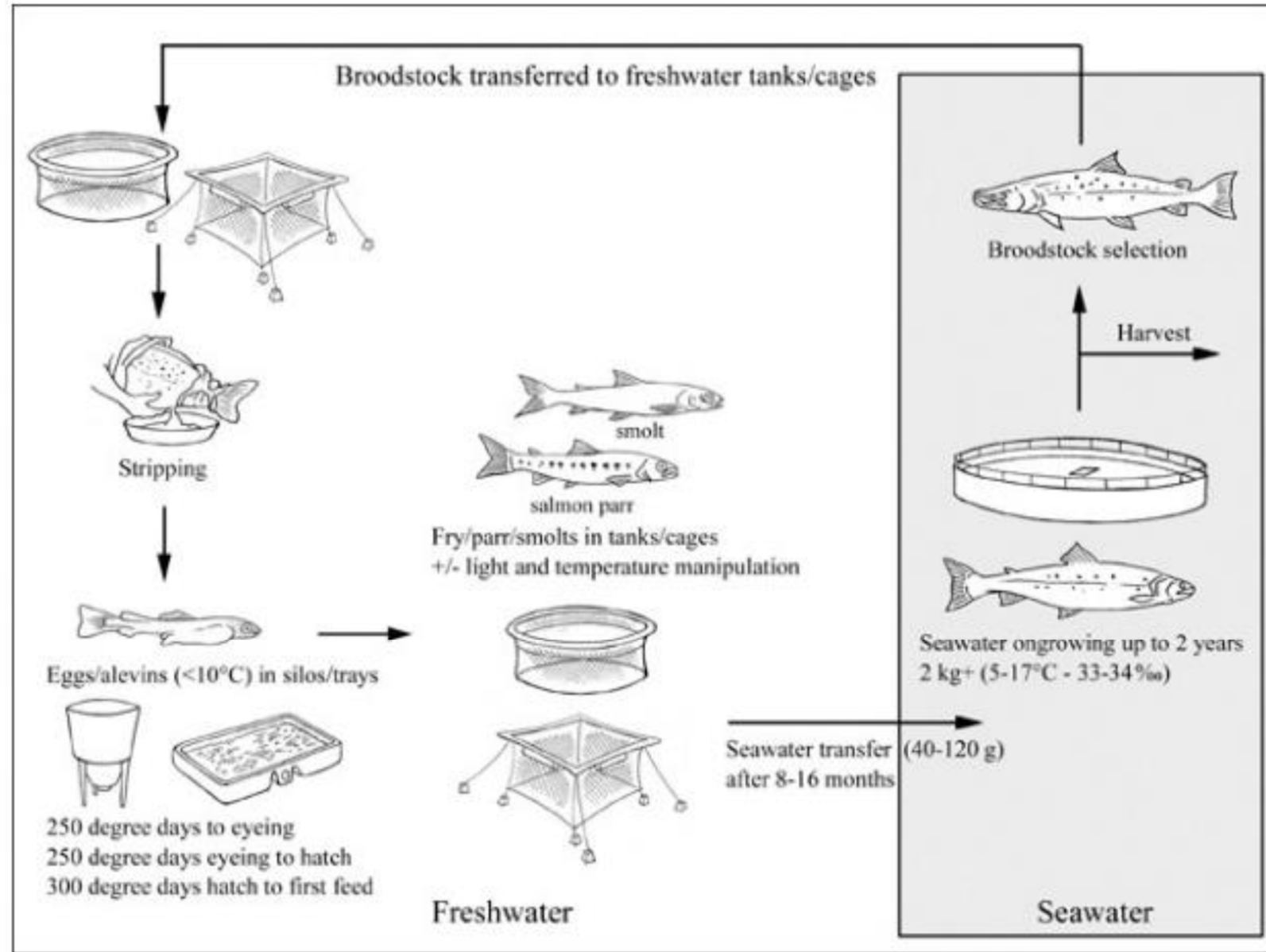


# Impact assessment

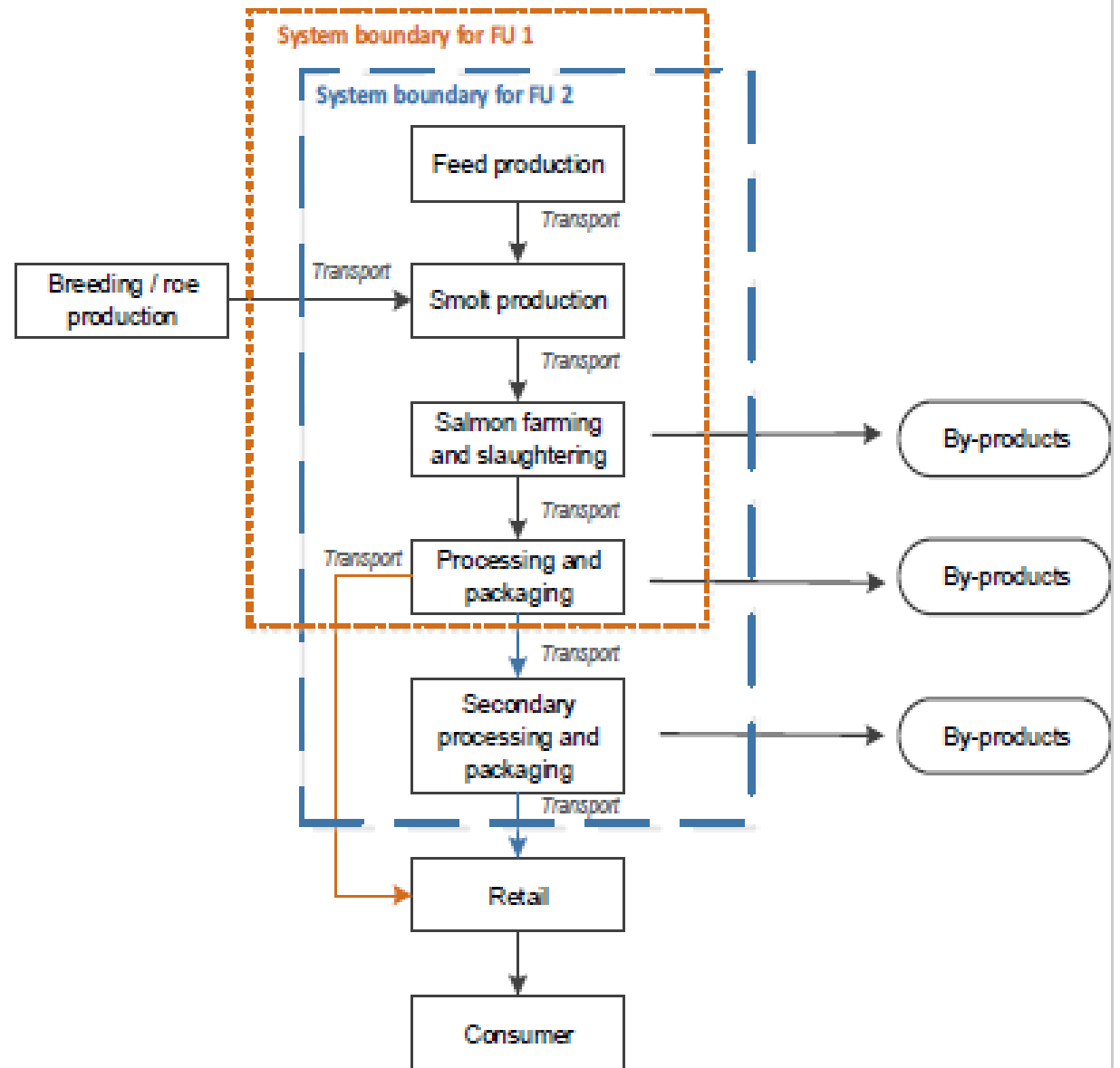
for 1 kg salmon fillets

„Agriculture also exists in water - aquacultures“

# Production of Salmons



# Inventory Analysis



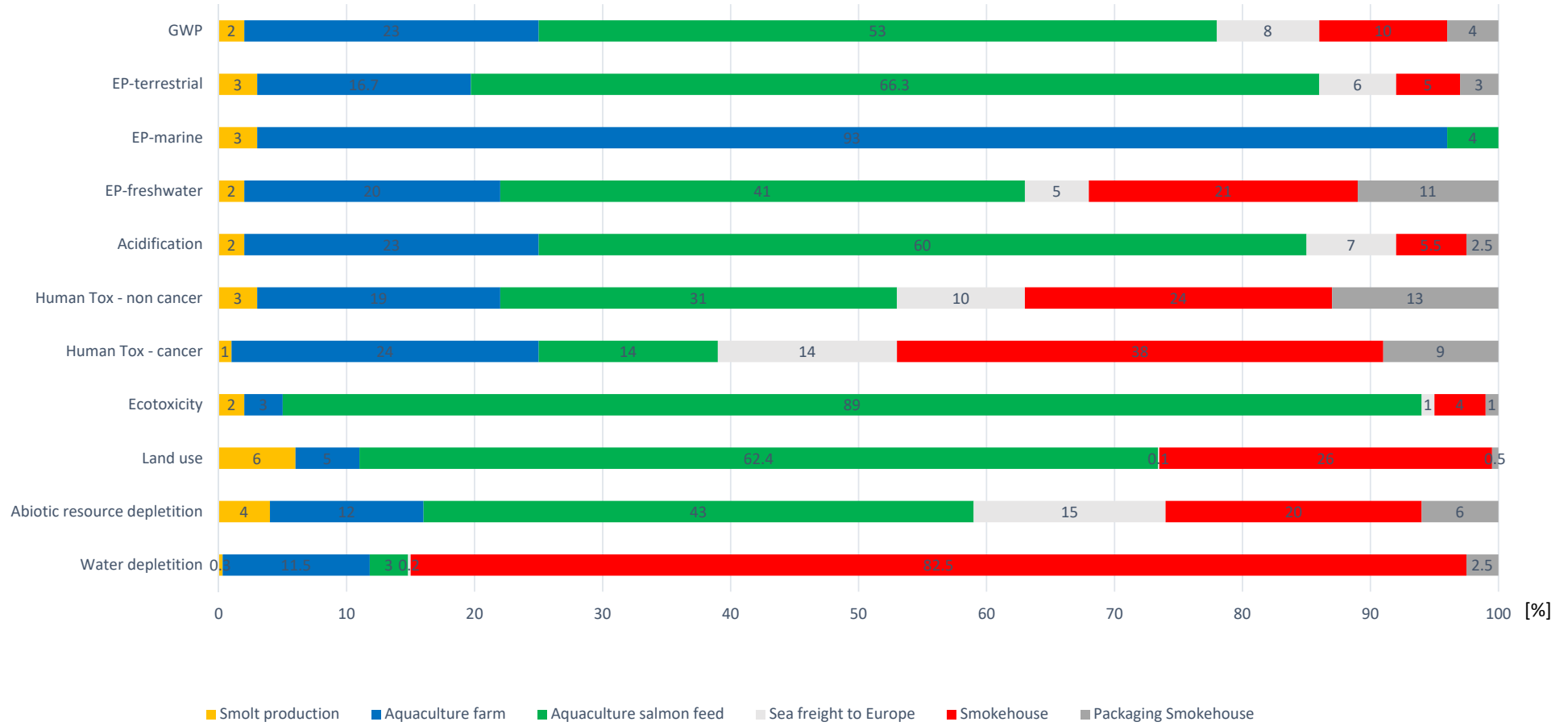
# Impact Assessment

|   |                                   |                  | in %             |                         |                       |            |                      |
|---|-----------------------------------|------------------|------------------|-------------------------|-----------------------|------------|----------------------|
|   | <b>Impact categories</b>          | Smolt production | Aquaculture farm | Aquaculture salmon feed | Sea freight to Europe | Smokehouse | Packaging Smokehouse |
|   | <b>GWP</b>                        | 2                | 23               | 53                      | 8                     | 10         | 4                    |
|   | <b>EP-terrestrial</b>             | 3                | 16.7             | 66.3                    | 6                     | 5          | 3                    |
|   | <b>EP-marine</b>                  | 3                | 93               | 4                       |                       |            |                      |
|   | <b>EP-freshwater</b>              | 2                | 20               | 41                      | 5                     | 21         | 11                   |
|   | <b>Acidification</b>              | 2                | 23               | 60                      | 7                     | 5.5        | 2.5                  |
|   | <b>Human Tox - non cancer</b>     | 3                | 19               | 31                      | 10                    | 24         | 13                   |
|   | <b>Human Tox - cancer</b>         | 1                | 24               | 14                      | 14                    | 38         | 9                    |
|   | <b>Ecotoxicity</b>                | 2                | 3                | 89                      | 1                     | 4          | 1                    |
|   | <b>Land use</b>                   | 6                | 5                | 62.4                    | 0.1                   | 26         | 0.5                  |
|   | <b>Abiotic resource depletion</b> | 4                | 12               | 43                      | 15                    | 20         | 6                    |
|   | <b>Water depletion</b>            | 0.3              | 11.5             | 3                       | 0.2                   | 82.5       | 2.5                  |
| <b>CAUTION --&gt; Inverse table for graph</b> |                                   |                  |                  |                         |                       |            |                      |

# Impact assessment of 1 kg salmon fillets

GWP: Global Warming Potential  
EP: Eutrophication Potential

## Impact categories



# Possibilities of interdisciplinary lesson design around the topic of aquaculture



- According to the WWF, 90% of the world's fish stocks are overexploited or maximally exploited, so that the simultaneously increasing global consumption can only be met by fish farming in aquacultures.

## Possibilities of interdisciplinary lesson design around the topic of aquaculture



- To produce one kilogram of salmon, three kilograms of wild fish are needed . This seems contradictory at first, since more wild fish is caught than is later produced. However, these are fish species that are not suitable for human consumption. In addition, fish leftovers or supply surpluses from the consumer economy are used
- The feed is supplemented with vegetable protein carriers, such as soy. This can only be sustainable if strict guidelines on cultivation apply.

(MSC, 2014; WWF 2020)

# Possibilities of interdisciplinary lesson design around the topic of aquaculture



- Numerous outbreaks of farmed fish cause damage to wild populations
- Unfiltered process water can cause damage to flora and fauna.
- Aquacultures promote infections and parasite infestations. Antibiotics and pesticides must be used for prevention and treatment. Their use can be enormously high depending on the location.
- Feeding critical for carnivores and omnivorous fish species. They need not only vegetable proteins, but receive fish meal and oil.



# Possibilities of interdisciplinary lesson design around the topic of aquaculture



- "Agriculture also exists in water" and it is becoming increasingly important for future and sustainable development projections.
- Diversity of aquaculture methods enables worldwide farming of fish and other marine life.
- Fish farming in aquaculture is promising for the future, under the premise that the multi-layered impacts on the environment can be contained and eventually completely prevented.
- At the same time, the share of CO<sub>2</sub> emissions of aquaculture farms is significantly lower than that of livestock farms.

# Quellen:

- Environmental impact assessment for the European food industry  
LCA of food and drink products  
Geneviève Doublet, Niels Jungbluth - ESU-services Ltd. Gyða Mjöll Ingólfssdóttir, Eva Yngvadóttir - EFLA
- WWF (2015): *Living Blue Planet Report. Species, habitats and human well-being.*  
<https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Living-Blue-Planet-Report-2015.pdf>
- Marine Stewardship Council <https://www.msc.org/de>
- MacLeod, M., Hasan, M.R., Robb, D.H.F. & Mamun-Ur-Rashid, M. (2019): *Quantifying and mitigating greenhouse gas emissions from global aquaculture.* In: FAO Fisheries and Aquaculture Technical Paper No. 626. Rome, FAO. <http://www.fao.org/3/ca7130en/ca7130en.pdf>
- SimaPro5 DEMO Version Education Classroom <https://simapro.com/databases/>



**SimaPro**



[www.lca-meets-efs.net](http://www.lca-meets-efs.net)