Food consumption and related water resources in Nordic cities

Abstract:
Many modern cities have strongly invested in the sustainability of their urban water management system. Nordic cities like Stockholm or Copenhagen are amongst pioneers in investments towards integrated urban water management. However, cities can never be fully self-sufficient due to their dependency on external (water) resources. In this paper, we quantify this water dependency with respect to food consumption in nine cities located in the five Nordic countries (Sweden, Denmark, Finland, Norway and Iceland), by means of the water footprint concept. Detailed urban water footprint assessments are scarce in the literature. By analysing national nutrition surveys, we find that urban food intake behaviour differs from national food intake behaviour. In large Nordic cities people eat generally less potatoes, milk products (without cheese), meat and animal fats and they drink less coffee than outside city borders. On the other hand, they generally eat more vegetables and vegetable oils and they drink more tea and alcoholic beverages. This leads consistently – for the six large Nordic cities Stockholm, Malmö, Copenhagen, Helsinki, Oslo and Reykjavik – to slightly smaller food related urban water footprints (−2 to −6%) than national average values. We also analyse the water footprint for different diets based upon Nordic Nutrition Recommendations (NNR) for these cities. We assessed three healthy diet scenarios: 1) including meat (HEALTHY-MEAT), 2) pesco-vegetarian (HEALTHY-PESCO-VEG) and 3) vegetarian (HEALTHY-VEG). This shows that Nordic urban dwellers 1) eat too many animal products (red meat, milk and milk products) and sugar and drink too much alcohol and 2) they eat not enough vegetables, fruit and products from the group pulses, nuts and oilcrops. Their overall energy and protein intake is too high. A shift to a healthy diet with recommended energy and protein intake reduces the urban WF related to food consumption substantially. A shift to HEALTHY-MEAT results in a reduction of −9 to −24%, for HEALTHY-PESCO-VEG the reduction is −29 to −37%, for HEALTHY-VEG the reduction is −36 to −44%. In other words, Nordic urban dwellers can save a lot of water by shifting to a healthy diet.

URI:
[1]

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Publication Year:
2017

Science Areas:
Agriculture and food security [3]
Environment and climate change [4]
Health and consumer protection [5]

Keywords:
adaptation [6]
agriculture [7]
citizen [8]
consumer [9]
efficiency [10]
environment [11]
fish [12]
food/feed [13]
governance [14]
health [15]
indicator [16]
mitigation [17]
modelling [18]
policy [19]
region [20]
research [21]
resources [22]
security [23]
sustainability [24]
water [25]

Publisher:
ELSEVIER SCIENCE BV

ISSN:
1470-160X

DOI:
10.1016/j.ecolind.2016.11.019 [26]


Links
[8] https://ec.europa.eu/jrc/en/search/site?f%5B0%5D=im_field_tags:2241
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