**Supplementary Information Table 1: Characteristics of Included Studies**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No.** | **First author** | **Year published** | **Location** | **Processing type** | **Study design** | **Participants** | **Processing** | **Outcomes** | **RoB score** | **Study title** | **DOI / identifier** |
| 1 | Aasmoe (1) | 2005 | Norway | Improved / mechanised factory setting | Questionnaires | 883 participants of men and women | White fish: salting (machines or manual), fillet (machines then manual);Shrimp: thawing (machines), cooking (machines), peeling (machines or manual), packing (manual);Salmon: unclear | Health, livelihood and equality outcomes | 9 | Skin symptoms in the seafood-processing industry in north Norway | 10.1093/occmed/kqm136 |
| 2 | Aasmoe (2) | 2008 | Northern Norway | Improved / mechanised factory setting | Cross sectional | Women and men | White fish: salting (machines or manual), fillet (machines then manual);Shrimp: thawing (machines), cooking (machines), peeling (machines or manual), packing (manual);Salmon: unclear | Negative health and equality outcomes for women | 10 | Musculoskeletal symptoms among seafood production workers in North Norway | 10.1111/j.0105-1873.2005.00515.x |
| 3 | Abeledo | 2006 | Galicia, Spain | Improved / mechanised, factory setting | Interviews, secondary data | Mixed accounts | Sardines: cleaning (manual), salt immersion (manual), frying or steaming (manual), canning (manual), sealing and sterilization (unclear, likely machines), washing (manual), labelling and packing (manual) | Equality and livelihood outcomes | 10 | Labour segmentation in the Spanish fish-canning industry: A historical perspective, 1880-1960 | 10.1017/S0268416006006072 |
| 4 | Akinpelu | 2013 | Ibadan, Nigeria |  Traditional | Interviews, surveys | 25% women, 75% men | Slaughtering, folding, air drying | Equality outcomes | 9 | Gender analysis of processing activities among commercial catfish processors within Ibadan metropolis, Oyo state south-western Nigeria | 10.4172/21559546.1000176 |
| 5 | AUWCL  | 2010 | Maryland, USA | Improved / mechanised, factory setting | cross sectional /interviews and statistical analysis | Women migrant workers | Crab picking | Health and livelihood outcomes | 7 | Picked Apart: The Hidden Struggles of Migrant Worker Women in the Maryland Crab Industry | No DOI |
| 6 | Barclay | 2022 | Fiji, Indonesia, Philippines and Solomon Islands | Comparative (Improved home/community-based; Improved/mechanised, factory setting) | Interviews | Men and women | Factory work | Positive equality and livelihood outcomes for women, fleeting mention of health | 6 | Tuna is women’s business too: Applying a gender lens to four cases in the Western and Central Pacific | 10.1111/faf.12634 |
| 7 | Chiwaula | 2018 | Southern Lake Malawi area |  Improved, home/community-based | Cross sectional | Not reported | Solar tent dryer | Equality and livelihood outcomes | 9 | Gender differences in willingness to pay for capital-intensive agricultural technologies: the case of fish solar tent dryers in Malawi | 10.1186/s40100-018-0096-2 |
| 8 | Choudhury | 2017 | Bangladesh | Comparative (Traditional; Improved / mechanised, factory setting) | Explorative qualitative study | Women | Shrimp processing | Economic returns, more confidence and greater sense of power (equity). Women work long hours; poor career prospects (livelihoods) | 7 | Women’s empowerment in aquaculture: Two case studies from Bangladesh | ISBN 978-92-5-109819-6https://gender.cgiar.org/publications/womens-empowerment-aquaculture-two-case-studies-bangladesh |
| 9 | Cole | 2018 | Barotse Floodplain, Zambia | Improved, home/home/community-based | Interviews; discussion | Women and men | Solar tent dryer, salting, a Chorkor kiln (improved smoking device). | Improved equality and livelihood outcomes for women | 7 | Postharvest fish losses and unequal gender relations: Drivers of the social-ecological trap in the Barotse Floodplain fishery, Zambia | 10.5751/ES-09950-230218 |
| 10 | Davies | 2009 | Nigeria | Comparative (Traditional; Improved, home/community-based) | Survey | Women | Brining and smoking, drying, smoking, frying, sun drying, various oven drying | Beneficial livelihood outcomes | 6 | Traditional and Improved Fish Processing Technologies in Bayelsa State, Nigeria | ISSN 1450-216X |
| 11 | Delaney | 2011 | Shichigahama, Miyagi Prefecture, Japan | Improved; home/community-based | Participant observation & qualitative interviews | Women | Drying | Livelihood outcomes | 6 | Transition in nori cultivation: Evolution of household contribution and gendered division of labor | No DOI |
| 12 | EMEDO | 2017 | Kagera region, Tanzania | Improved, home/community-based | Secondary data & fieldwork to produce video clips | Women employed in the fisheries sector | Across the fisheries value chain | Health, and equality outcomes | 5 | Women’s Role, Struggles and Strategies Across the Fisheries Value Chain. The Case of Lake Victoria—Tanzania | http://hdl.handle.net/1834/35990 |
| 13 | Forkuor | 2018 | Mfantseman Municipality, Ghana | Improved, home/community-based | Case study design | Women and men | Cleaning, smoking | Women experience positive economic returns (livelihoods); more support needed to enhance benefits (equity) | 8 | Assessment of the processing and sale of marine fish and its effects on the livelihood of women in Mfantseman Municipality, Ghana | 10.1007/s10668-017-9943-7 |
| 14 | Friberg | 2018 | Lofoten and Vesterålen, Norway | Comparative (Improved / mechanised, factory setting; Improved, home/community-based) | Semi-structured interviews | Native and migrant groups | Factory work | Equality and livelihood outcomes | 6 | Ethnicity as skill: immigrant employment hierarchies in Norwegian low-wage labour markets | 10.1080/1369183X.2017.1388160 |
| 15 | Frink | 2009 | Nelson Island, western Alaska |  Improved, home/community-based | Participant observation & qualitative interviews | Women and men | Butchering, braiding, drying | Equality and livelihood outcomes | 5 | The identity division of labor in Native Alaska | 10.1111/j.1548-1433.2009.01074.x |
| 16 | Galappaththi | 2021 | Nazirartek, Bangladesh; Ukerewe island by Lake Victoria in Tanzania; Mannar island in Sri Lanka |  Improved, home/community-based | Secondary data and case studies | Men and women | Gutting, cleaning, salting, and drying | Equality and livelihood outcomes | 5 | Linking social wellbeing and intersectionality to understand gender relations in dried fish value chains | 10.1007/s40152-021-00232-3 |
| 17 | Griffith | 1987 | North Carolina, USA | Comparative (Improved / mechanised, factory setting; Improved, home/community-based) | Interviews |  Black women and men | scallop shucking, picking meat from blue crabs, packing and shucking oysters. While small-scale are seasonal, plants import catches to ensure year-round work | Improved equality outcomes for women | 8 | Nonmarket Labor Processes in an Advanced Capitalist Economy | https://www.jstor.org/stable/677859 |
| 18 | Hamid | 1998 | Bangladesh | Improved / mechanised, factory setting | Secondary data | Poor Women (divorcees, widows) and urban-rural migration | Manual collection of shrimp fries (36% women, remaining men, usually poor - widows) and 70% women in Shrimp processing and beheading for export | Equity outcomes in terms of earnings, but due to poverty, living standards not improved much. Women potentially empowered from spending less time on household activities | 2 | Coming out of their homesteads: Employment for rural women in shrimp aquaculture in coastal Bangladesh | 10.1108/03068299810193489 |
| 19 | Hasniati | 2017 | Sanrobone District of Takalar Regency, Indonesia |  Improved, home/community-based | Interviews and focus groups | Heads and members of women’s groups | Seaweed farming | Livelihood outcomes – training in appropriate technologies and skills | 5 | The Empowerment of Coastal Women Through Capacity Improvement of Seaweed Farmer Groups Obstacles and Challenges | 10.2991/icas-17.2017.23 |
| 20 | Howse (1) | 2006 | Newfoundland, Canada | Improved / mechanised, factory setting | Survey, interview, allergen tests  | 58% women, 42% men | Packing, cleaning, loading, butchering, freezers | Negative health outcomes for women due to greater exposure to allergens; several occupational hazards given gender division of labour, but can’t risk losing jobs, equity | 10 | Gender and snow crab occupational asthma in Newfoundland and Labrador, Canada | 10.1016/j.envres.2005.06.008 |
| 21 | Howse (2) | 2012 | Newfoundland, Canada and South Africa | Improved / mechanised, factory setting | Questionnaires & interviews | 62% female work force, Black women in SA58% for questionnaire, 55% for worker health assessment | Seafood and salt fish processing; Cleaning and packing in Canada and cannery and labelling in SA  | Negative health outcomes for women;Jobs precarious – long hours, low wages (livelihoods) and equity | 9 | The Changing Political Economy of Occupational Health and Safety in Fisheries: Lessons from Eastern Canada and South Africa | 10.1111/j.1471-0366.2011.00343.x |
| 22 | Ike-Obasi | 2019 | Asari-Toru, Nigeria  | Traditional | questionnaires and statistical analysis | Women, over half married, 25-41 years of age | fish smoking (mud and half-drum kiln), oven, sun and drying | Health outcomes | 6 | The Roles of Women in Fish Processing Activities in Some Local Government Areas of Rivers State, Nigeria | https://ssrn.com/abstract=3669534 |
| 23 | Jeebhay | 2008 | West South Africa | Improved / mechanised, factory setting | Cross sectional & stratified random sample | 63% women, 37% men | Processing plants for pilchard Canning & fishmeal processing | Negative health outcomes for women | 10 | Occupational allergy and asthma among saltwater fish processing workers | 10.1002/ajim.20635 |
| 24 | Kaminski | 2020 | Barotse Floodplain, Zambia | Traditional | Qual & quant, following EFLAM - Exploratory Fish Loss Assessment Method. | 30% Women, rest men, in 6 camps, 204 fishers, processors and traders | processing and trade actors | Equality and livelihood outcomes: women faced more total losses due to lack of capital and improved technology | 6 | Fish losses for whom? A gendered assessment of post-harvest losses in the Barotse floodplain fishery, Zambia | 10.3390/su122310091 |
| 25 | Larson | 2022 | Indonesia | Traditional  | interviews | 74 women from 9 seaweed farming villages | seaweed farming and artisanal seaweed processing | Livelihood outcomes | 8 | Understanding feedback relationships between resources, functionings and well-being: A case study of seaweed farming and artisanal processing in Indonesia | 10.1007/s13280-021-01581-3 |
| 26 | Mazumi | 2021 | USA | Improved / mechanised, factory setting | comparative historical analysis (USA & Japan) | Literature review, focus is migrant workers in USA /Japan | seafood processing: cutting, deboning, smoking, fermenting, drying | Livelihood outcomes | 4 | Migration outside large cities: a comparison of the hiring of migrants for the food processing industry in the United States and Japan | 10.1186/s40878-021-00258-w |
| 27 | Nagoli | 2018 | Salima District and Mangochi District, southern Lake Malawi | Traditional  | qualitative (questionnaire, FGD, interview, observations) and statistical analysis | 502 fishers (265 male and 244 female) in 2015, 353 in 2017, with an attrition rate of 30% in 2017 - women, men and youths | sun drying on open racks, smoking, frying | Health outcomes | 8 | Inclusive Ecosystems? Women’s Participation in the Aquatic Ecosystem of Lake Malawi | 10.3390/environments6010003 |
| 28 | Ngaruiya | 2019 | Kampi Samaki, Lake Baringo, Kenya | Traditional | cross-sectional social survey (interview, observation, statistical analysis) | 100 participants - 52% male 48% female | smoking, frying,  | Health outcomes | 9 | Occupational Health Risks and Hazards Among the Fisherfolk in Kampi Samaki, Lake Baringo, Kenya | 10.1177/1178630219881463 |
| 29 | Nwabeze | 2012 | Lake Kainji, Nigeria | Traditional | Secondary data | Women and their ethnicity | Processing and preservation | Livelihood outcomes for households and local communities | 3 | Gender and fisheries of Lake Kainji, Nigeria: a review | 10.3923/jfas.2013.9.13 |
| 30 | Omeje | 2022 | Kainji Lake Basin, Nigeria | Traditional | Interview and regression analysis | 80 participants including women, men, youths | farmed catfish processors/ fish smoking.70% use traditional banda kilns and about 20% improved, however, the study doesn’t report separately on these. | Income and livelihoods, and recommends support for improved kilns | 8 | Economics of Smoked Farmed Catfish in Kainji Lake Basin, Nigeria | 10.4314/jae.v26i2.1 |
| 31 | Raffnsdottir | 2004 | Northern Iceland | Improved / mechanised, factory setting | Cross sectional | 73% women, 27% men | Manual and mechanised cutting and packing | Negative health outcomes for women, new technologies negatively affect their livelihoods  | 9 | New technology and its impact on well being | PMID: 14757904. |
| 32 | Ramirez | 2020 | Zamboanga Peninsula, Philippines | Traditional | Gender-inclusive value chain analysis, secondary data | Women and men | Cleaning, salting and drying | Livelihood outcome - Women not paid but contribute to family income | 7 | Gender-inclusive value chains: the case of seaweed farming in Zamboanga Peninsula, Philippines | 10.1080/09718524.2020.1728810 |
| 33 | Salim | 2013 | Kerala, Malabar Coast of India | Traditional | Survey and secondary data | women, men and youths | Sun-drying, salting, smoking and preparing fish and fish-derived foods | Beneficial livelihood (economic) and equality (political) outcomes for women  | 9 | Empowerment of fisherwomen in Kerala – an assessment | http://eprints.cmfri.org.in/id/eprint/9598 |
| 34 | Sangaramoorthy | 2019 | Maryland, USA | Improved / mechanised, factory setting | Interviews and participant observation | Migrants, men and women | Cleaning, butchering, cooking | Negative health outcomes | 8 | Liminal Living: Everyday Injury, Disability, and Instability among Migrant Mexican Women in Maryland’s Seafood Industry | 10.1111/maq.12526 |
| 35 | Santos | 2015 | Bahia, Brazil | Traditional | Survey, interviews & participant observation | 73% men, 27% women | Cleaning and butchering | Equality and livelihood outcomes | 6 | Fisheries as a way of life: Gendered livelihoods, identities and perspectives of artisanal fisheries in eastern Brazil | 10.1016/j.marpol.2015.09.007 |
| 36 | Solano | 2021 | Gulf of California, USA | Improved, home/community-based | Participatory interviews & workshops | 27 women, 30 men | Weight sorting, preparation, cleaning & canning | Equality and livelihood outcomes | 8 | Unveiling Women’s Roles and Inclusion in Mexican Small-Scale Fisheries | 10.3389/fmars.2020.617965 |
| 37 | Tomita | 2010 | Samut Sakorn, Thailand | Improved / mechanised, factory setting | Cross-sectional survey & questionnaire | 113 women and 52 men, by nationality | Cleaning, butchering, steaming and sealing cans | Health, equality and livelihood outcomes | 10 | Prevalence and risk factors of low back pain among Thai and Myanmar migrant seafood processing factory workers in Samut Sakorn Province, Thailand | 10.2486/indhealth.48.283 |
| 38 | Torell | 2021 | Lake Malawi, Malawi | Traditional | Case study design | men and women | Fish processing | Equality and livelihood outcomes | 6 | Assessing and Advancing Gender Equity in Lake Malawi's Small-Scale Fisheries Sector | 10.3390/su132313001 |
| 39 | United Nations Industrial Development Organization (UNIDO) | 2021 | Cambodia | Traditional  | Questionnaires | 79% women, 21% men | making fish sauce, marinating, smoking, salting, fermenting, cleaning, boiling, steaming | Negative health outcomes for women, livelihoods | 10 | Gender analysis of post-harvest fisheries in Cambodia | No DOI |
| 40 | Warrier | 2001 | India | Improved / mechanised, factory setting | Survey, observation, informal discussion | 309 women workers, mostly migrant | Cleaning, grading, packing | Health, livelihood and equality outcomes | 4 | Women at Work: Migrant Women in Fish Processing Industry | https://www.jstor.org/stable/4411119 |
| 41 | Yingst | 2018 | Westfjords, Iceland | Improved / mechanised, factory setting | Interviews & surveys | Immigrant women from Poland and Philippines vs Icelandic women | Fish processing plants: cut, clean, package  | Equality and livelihood outcomes | 9 | Gendered labor in the Icelandic fish processing industry | 10.1007/s40152-018-0099-3 |
| 42 |  Zelasney (Ford) | 2020 | Ivory Coast: Braffedon village and Grand-Lahou city | Improved, home/community-based | Cohort study | Women | smoking using metal drum kiln, or Chorkor kiln (developed in Ghana in 1960s)  | Health, livelihood and equality outcomes | 6 | The FAO-Thiaroye processing technique: Facilitating social organization, empowering women, and creating market opportunities in West Africa | 10.4060/ca8402en |

**Supplementary Information Table 2: Risk of Bias Assessment for All Included Papers**

Type of processing: Mechanised (factory setting), Traditional (home-based), Improved (home/community-based)

Assessed Categories numbered 1 to 9, max category score in brackets (1,2)

Risk of Bias (RoB) classification: 9-12: low risk of bias (LOW), 5-8: medium risk of bias (MED), 1-4: high risk of bias (HIGH)

| **No.** | **Processing type** | **First author and publication year**  | **1. Design (1)** | **2. Literature (1)**  | **3. Participant selection (2)** | **4. Comparability (1)** | **5. Assessment of outcome (1)**  | **6. Methodology (2)** | **7. Use of indicators (2)** | **8. Limitations (1)** | **9. Conclusion (1)** | **Total score (max 12)**  | **RoB classification** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | Mechanised factory setting | **Aasmoe 2005** | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | **9** | **Low** |
| **2** | Mechanised factory setting | **Aasmoe 2008** | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | **10** | **Low** |
| **3** | Mechanised factory setting | **Abeledo 2006** | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 1 | **10** | **Low** |
| **4** | Traditional (homebased)  | **Akinpelu 2013** | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | **9** | **Low** |
| **5** | Mechanised factory setting  | **AUWCL 2010** | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | **7** | **Med** |
| **6** | Improved, home/community-based | **Barclay 2022** | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | **6** | **Med** |
| **7** | Improved, home/community-based  | **Chiwaula 2018**  | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | **9** | **Low** |
| **8** | Comparative (Traditional; mechanised factory setting)  | **Choudhury 2017** | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | **7** | **Med** |
| **9** | Improved, home/community-based  | **Cole 2018** | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | **7** | **Med** |
| **10** | Comparative (Traditional; Improved, home/community-based)  | **Davies 2009**  | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | **6** | **Med** |
| **11** | Improved; home/community-based  | **Delaney 2011** | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | **6** | **Med** |
| **12** | Improved, home/community-based  | **EMEDO 2017** | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | **5** | **Med** |
| **13** | Improved, home/community-based  | **Forkuor 2018** | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 1 | **8** | **Med** |
| **14** | Comparative (mechanised, factory setting; Improved, home/community-based)  | **Friberg 2018** | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | **6** | **Med** |
| **15** | Improved, home/community-based  | **Frink 2009** | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | **5** | **Med** |
| **16** | Improved, home/community-based  | **Galapaaththi 2021** | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | **5** | **Med** |
| **17** | Comparative (mechanised, factory setting; Improved, home/community-based)  | **Griffith 1987** | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | **8** | **Med** |
| **18** | mechanised, factory setting  | **Hamid 1998** | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **2** | **High** |
| **19** | Improved, home/community-based  | **Hasniati 2017** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | **5** | **Med** |
| **20** | mechanised, factory setting  | **Howse 2006** | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 0 | **10** | **Low** |
| **21** | mechanised, factory setting  | **Howe 2012** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | **9** | **Low** |
| **22** | Traditional  | **Ike-Abasi 2019**  | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | **6** | **Med** |
| **23** | mechanised, factory setting  | **Jeebhay 2008** | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 1 | **10** | **Low** |
| **24** | Traditional  | **Kaminiski 2020**  | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | **6** | **Med** |
| **25** | Traditional  | **Larson 2022** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | **8** | **Med** |
| **26** | mechanised, factory setting  | **Mazumi 2021** | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | **4** | **High** |
| **27** | Traditional  | **Nagoli 2018** | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | **8** | **Med** |
| **28** | Traditional  | **Ngaruiya 2019** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | **9** | **Low** |
| **29** | Traditional  | **Nwabeze 2012** | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | **3** | **High** |
| **30** | Traditional  | **Omeje 2022** | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | **8** | **Med** |
| **31** | mechanised, factory setting  | **Raffnsdottir 2004**  | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | **9** | **Low** |
| **32** | Traditional  | **Ramirez 2020** | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | **7** | **Med** |
| **33** | Traditional  | **Salim 2013** | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | **9** | **Low** |
| **34** | mechanised, factory setting  | **Sangaramoorthy 2019** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | **8** | **Med** |
| **35** | Traditional  | **Santos 2015** | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | **6** | **Med** |
| **36** | Improved, home/community-based  | **Solano 2021**  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | **8** | **Med** |
| **37** | mechanised, factory setting  | **Tomita 2010** | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | **10** | **Low** |
| **38** | Traditional  | **Torell 2021** | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | **6** | **Med** |
| **39** | Traditional  | **UNIDO 2021** | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | **10** | **Low** |
| **40** | mechanised, factory setting  | **Warrier 2001** | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | **4** | **High** |
| **41** | mechanised, factory setting  | **Yingst 2018** | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | **9** | **Low** |
| **42** | Improved, home/community-based  | **Zelasney (Ford)****2020** | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | **6** | **Med** |
| **Average** | **0.95** | **0.95** | **0.74** | **0.64** | **0.88** | **0.71** | **1.02** | **0.33** | **0.98** | **7.21** | **Med** |

\*Studies with higher grade points indicate lower risk of bias relative to studies with lower grade points in this table.

**Supplementary Information Table 3: Study locations**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **First author** | **Publication year** | **Location** | **Latitude** | **Longitude** |
| 1 | Aasmoe | 2005 | Northern Norway | 69.6496 | 18.956 |
| 2 | Aasmoe | 2008 | Northern Norway | 69.6496 | 18.956 |
| 3 | Abeledo | 2006 | Galicia, Spain | 42.5751 | -8.1339 |
| 4 | Akinpelu | 2013 | Ibadan, Nigeria | 7.3775 | 3.947 |
| 5 | AUWCL | 2010 | Maryland, USA | 39.0458 | 76.6413 |
| 6 | Barclay | 2022 | Fiji | -17.7134 | 178.065 |
| 6 | Barclay | 2022 | Solomon Islands | -9.6457 | 160.1562 |
| 6 | Barclay | 2022 | General Santos City, Philippines | 6.1164 | 125.1716 |
| 6 | Barclay | 2022 | Bitung, Indonesia | 4.0714 | 127.5426 |
| 7 | Chiwaula | 2018 | Salima and Mangochi, southern Lake Malawi | -13.7487 | 34.4601 |
| 8 | Choudhury | 2017 | Bangladesh | 23.685 | 90.3563 |
| 9 | Cole | 2018 | Barotse Floodplain, Zambia | -15.8833 | 23.75 |
| 10 | Davies | 2009 | Nigeria | 9.0817 | 8.6753 |
| 11 | Delaney | 2011 | Shichigahama, Miyagi Prefecture, Japan | 38.4292 | 141.0742 |
| 12 | EMEDO | 2017 | Kagera region, Tanzania | -1.3309 | 31.715 |
| 13 | Forkuor | 2018 | Mfantseman Municipality, Ghana | 5.508 | -1.4648 |
| 14 | Friberg | 2018 | Lofoten and Vesteralen, Norway | 68.218 | 13.6239 |
| 15 | Frink | 2009 | Nelson Island, western Alaska | 60.7202 | -164.7005 |
| 16 | Galappaththi | 2021 | Nazirartek, Bangladesh | 60.6638 | -45.4364 |
| 17 | Galappaththi | 2021 | Mwanza, Tanzania | -2.5164 | 32.909 |
| 17 | Galappaththi | 2021 | Mannar Island, Sri Lanka | 8.8829 | 79.9607 |
| 17 | Griffith | 1987 | North Carolina, USA | 35.7596 | -79.0193 |
| 18 | Hamid | 1998 | Bangladesh | 23.685 | 90.3563 |
| 19 | Hasniati | 2017 | Sanrobone District, Takalar Regency, Indonesia | 5.4636 | -2.1866 |
| 20 | Howse | 2006 | Newfoundland, eastern Canada | 53.1355 | -57.6604 |
| 21 | Howse | 2006 | Labrador, eastern Canada | 53.1355 | -57.6604 |
| 21 | Howse | 2012 | Newfoundland, eastern Canada | 53.1355 | -57.6604 |
| 22 | Howse | 2012 | Labrador, eastern Canada | 53.1355 | -57.6604 |
| 22 | Howse | 2012 | Western Cape Province | -33.9249 | 18.4241 |
| 22 | Ike-Abasi | 2019 | Asari-Toru, Nigeria  | 4.614 | 6.1325 |
| 23 | Ike-Abasi | 2019 | Obuama Abonnema, Nigeria | 4.547 | 6.2636 |
| 23 | Ike-Abasi | 2019 | Abonnema, Nigeria | 4.7084 | 6.786 |
| 23 | Jeebhay | 2008 | Western South Africa | -30.5595 | 22.9375 |
| 24 | Kaminski | 2020 | Barotse Floodplain, Zambia | -15.03157635 | 22.88318897 |
| 25 | Larson | 2022 | Indonesia | -0.7893 | 113.9213 |
| 26 | Mazumi | 2021 | USA | 39.7837 | -100.4459 |
| 27 | Mazumi | 2021 | Japan | 36.2048 | 138.2529 |
| 27 | Nagoli | 2018 | Salima District and Mangochi District, southern Lake Malawi | -14.4 | 34.55 |
| 28 | Ngaruiya | 2019 | Lake Baringo, Kenya | 0.6682 | 36.0363 |
| 29 | Nwabeze | 2012 | Lake Kainji, Nigeria | 9.35 | 4.55 |
| 30 | Omeje | 2022 | Kainji Lake Basin, Nigeria | 9.6836 | 4.8196 |
| 31 | Raffnsdottir | 2004 | Northern Iceland | 65.9786 | -18.5299 |
| 32 | Raffnsdottir | 2004 | Western Iceland | 64.9631 | -21.228 |
| 32 | Ramirez | 2020 | Zamboanga Peninsula, Philippines | 7.8381 | 122.9202 |
| 33 | Salim | 2013 | Kerala, Malabar Coast of India | 10.8505 | 76.2711 |
| 34 | Sangaramoorthy | 2019 | Maryland, USA | 39.0458 | -76.6413 |
| 35 | Santos | 2015 | Bahia, northeast Brazil | -12.5797 | -41.7007 |
| 36 | Solano | 2021 | Gulf of California, USA | 28 | -112 |
| 37 | Solano | 2021 | Mesoamerican Reef, Mexico | 18.1652 | -87.9931 |
| 37 | Tomita | 2010 | Samut Sakorn, Thailand | 13.5432 | 100.2739 |
| 38 | Torell | 2021 | Lake Malawi, Malawi | -12.287 | 34.1683 |
| 39 | UNIDO | 2021 | Cambodia | 12.5657 | 104.991 |
| 40 | Warrier | 2001 | India | 20.5937 | 78.9629 |
| 41 | Yingst | 2018 | Westfjords, Iceland | 65.9192 | -21.8569 |
| 42 | Zelasney (Ford) | 2020 | Cote d'Ivoire | 7.54 | -5.5471 |

# **Supplementary Information: Details of Methodology and Search Strategies**

**Study Methodology**

We included quantitative and qualitative research of any design (including systematic reviews, trials, other intervention studies, observational, economic modelling and qualitative studies) that addressed our question. Non-research-based designs (such as opinion pieces and non-systematic reviews) and human studies with fewer than 5 participants were not included although they were checked for relevant references. Non-English language studies were excluded due to the potential bias of including only a few foreign language studies as we did not have the resources to search in all relevant languages.

**Processing Types**

Fish and aquatic food processing and post-harvest technology could include processing of fin fish, crustaceans, molluscs and/or other aquatic foods (from marine or freshwater settings) such as seaweed 53,69. Processing and post-harvest technology include (but are not limited to) canning, drying, freeze-drying, cooking, smoking, chemical smoking, freezing, salting, pressing, high (hydrostatic) pressure, pulsed electric fields, irradiation, use of processing byproducts (head, viscera, skin, shells, frames, bones) for biooils or “bioactive peptide-rich protein hydrolysates”. Products may be raw, stored, part-processed or finished, and include whole fish, fish fillets, dried, canned, breaded, frozen, gelled, reformed or cured seafoods, fish oils, extracts, fingers or meals. Dryers can include solar, convective and rotary dryers, and processes such as ultrasonication, microwaving or osmosis prior to drying. Smoking can use wood fuels, solar or other renewable resources. Post-harvest technology could include processes aiming to maintain taste, colour, flavour, smell, texture or nutritional value, increase shelf-life, protect the seafood from insects or pests and increase availability through the year.

***Table 1. Inclusion-Exclusion Criteria***

|  |  |  |
| --- | --- | --- |
| Criterion  | Included | Excluded |
| Study methodology | Any quantitative or qualitative research methodology including:* systematic reviews
* trials
* other intervention studies
* observational studies
* qualitative studies
* economic modelling studies

Can be full text, abstracts only, grey literature or unpublished data. Studies may come from:* any part of the world
* any populations, men, women or children
* be published in English
* any date
 | Non-research-based designs such as reviews, opinion pieces and discussions (without methodology) Case reports and studies with fewer than 5 individual participants Published in non-English languages  |
| Participants | May recruit humans involved in (or affected by) fish or aquatic food processing  |  |
| Processing  | Fish and aquatic food processing and post-harvest technology may include processing of fin fish, crustaceans, molluscs and/or other aquatic foods (from marine or freshwater settings) such as seaweed. Processing and post-harvest technology would include (but not be limited to) high-tech and low-tech processes including canning, drying, freeze drying, cooking, smoking, chemical smoking, freezing, salting, pressing, high (hydrostatic) pressure, pulsed electric fields, use of processing by-products (head, viscera, skin, shells, frames, bones) for biooils or “bioactive peptide-rich protein hydrolysates”. Products may be raw, stored, part-processed or finished, and include whole fish, fish fillets, dried, canned, breaded, smoked, chilled, cooled, frozen, gelled, reformed or cured seafoods, fish oils, extracts, fingers or meals. Dryers can include solar, convective and rotary dryers, and processes such as ultrasonication, microwaving or osmosis prior to drying. Smoking and cooling (refrigeration and freezing) may include any relevant traditional or renewable technologies. Post-harvest technology may include processes aiming to maintain taste, colour, flavour, smell, texture or nutritional value, increase shelf-life, protect the seafood from insects or pests and increase availability through the year. |  |
| Outcomes | Equity, health, livelihoods and social justice, including equity and inequity, ageism, sexism, xenophobia and racism.  |  |
| Analysis | Must provide (or plan to provide) information on the relationship between processing and some type of health, livelihood or social equity or inequity, whether quantitative or qualitative | Non-systematic reviews will be checked for references, but not included |

**Data Extraction and Management**

The following study characteristics were included for data extraction:

1. bibliographic details;
2. trial or study registration number(s);
3. methods: study design, duration and start date, number of study centres and location, study setting, withdrawals, was there a comparison (if yes, between which interventions or between which time periods), were participants allocated to interventions (and if yes, how did that allocation occur?), were any parts of the study prospective (and if yes, which?), if study not randomised were confounders assessed (and if yes, which?), if there was a comparison was there an assessment of baseline comparability (and if yes, report results);
4. question addressed by the study; main study aim, and where relevant the particular aim relevant to this review
5. participants (as relevant, participants could be individuals, organisations, settings or locations for example, depending on study design): inclusion criteria, exclusion criteria, type of participants, number (and number in each arm where relevant), cluster size (where relevant), relevant participant characteristics;
6. type of technology or processing: types of aquatic fish or seafood processing or post-harvest technology assessed, any alterations in types of processing/technology or altered processing/technology);
7. outcomes: data on environmental sustainability or equity (expressed quantitatively or qualitatively); and
8. trial funding and notable conflicts of interest of trial authors.

**Risk of Bias Assessment**

**Table 2: Risk of Bias Assessment Criteria and Scores**

|  |  |
| --- | --- |
| **Category** | Score |
| **1. Study clearly describes how the research was designed and conducted** |  |
| Yes | 1 |
| No | 0 |
| **2. Builds on previous research (relevant literature review)** |  |
| Yes | 1 |
| No | 0 |
| **3. Selection/Representativeness** |  |
| Truly representative of the average (described) in the community | 2 |
| Somewhat representative of the average in the community | 1 |
| No description of the derivation of the cohort/participants | 0 |
| **4.Study compares compare gender/age/migrant status/etc.** |  |
| Any population group compared | 1 |
| No groups compared | 0 |
| **5. Type of assessment of outcome** |  |
| Structured interview or survey, or secure record | 1 |
| No description | 0 |
| **6. Clarity of indicator selection in the methodology** |  |
| Used clear indicators in Randomised Control Trial design | 2 |
| Cross-sectional study/interviews/secure records reviewed  | 1 |
| Anecdotal data, or method is not described | 0 |
| **7. Use of relevant indicators (qualitative or quantitative)**  |  |
| Used indicators consistently | 2 |
| Has used indicators (not consistently) | 1 |
| Purely anecdotal | 0 |
| **8. Limitations recognised by the researchers** |  |
| Yes | 1 |
| No  | 0 |
| **9. Inclusion of logical conclusion**  |  |
| Yes | 1 |
| No  | 0 |

**Measure of Effect**

We describe outcome data as reported in the individual studies.

**Data Synthesis**

It was unlikely that we would find sets of studies addressing the same questions, using the same methodologies and reporting the same outcomes in a way that could be combined in meta-analysis. However, we planned that, if meaningful meta-analysis were possible, we would conduct ‘random effects’ meta-analysis (with fixed effects sensitivity analyses and limiting analyses to studies at lower risk of bias). We planned to use the I² statistic to measure heterogeneity among any studies and comparison of random- and fixed-effects meta-analysis would enable us to assess small study bias. The following factors were identified as critical to a sub-group analysis.

1. Type of organisation conducting the processing (private company, state supported organisation, community cooperative, individual operator)
2. Economic status of the country where the processing takes place
3. Processing for local consumption or export
4. Local regulations
5. Male, female or organisational management of processors

As meta-analysis or sub-group analysis seemed unlikely, given the small number of studies, we decided that our main reporting method would be to address the review question through tabulation and narrative synthesis, using meta-ethnographic approaches.

**Reaching Conclusions**

Conclusions were based on findings from the narrative synthesis of included studies. We were interested in the extent, findings and risk of bias of the available research, and provided recommendations of key areas and methodologies for further research.

**Electronic search strategies**

SCOPUS search strategy

Run on 10th Oct 2022 – 1448 titles and abstracts downloaded

TITLE-ABS-KEY ( seafood\* OR fish OR fishes OR crustacean\* OR seaweed\* OR mollusc\* OR aquaculture OR ( (marine OR sea OR aquatic OR abalone OR anchovies OR barramundi OR cod OR "Bombay Duck\*" OR bream OR brill OR carp OR clam OR clams OR coley OR crab OR crayfish OR cuttlefish OR dabs OR sole OR eel OR flounder OR goosenecks OR mullet OR gurnard OR haddock OR hake OR halibut OR herring OR "John Dory" OR kingfish OR kingklip OR langoustine OR ling OR lobster OR mackerel OR mahi OR megrim OR monkfish OR mussel\* OR octopus OR oyster\* OR toothfish OR pike OR plaice OR pollack OR prawns OR snapper OR salmon OR sardines OR scallops OR scampi OR bass OR "Sea Urchin\*" OR shrimp OR pomfret OR skate OR snails OR squid OR sturgeon OR swordfish OR trout OR tuna OR turbot OR whelks OR whitebait OR whiting OR winkles OR "Wolf Fish\*" OR "Yellowtail Kingfish" OR zander OR rui OR catla OR tilapia OR pangas) W/3 ( food\* OR edible OR protein\* OR product\* OR oil\* OR extract\* ) ) ) AND TITLE-ABS-KEY (post-harvest\* OR “post harvest\*” OR postharvest\* OR “value chain\*” OR process OR processing OR processed OR preserve\* OR dried OR canned OR canning\* OR tinned OR tinning OR dry OR drying OR dried OR froze OR freez\* OR salt\* OR fillet\* OR cured OR curing OR convect\* OR ultrasonic\* OR microwav\* OR "pulse field\*" OR "high pressur\*" OR byproduct\* OR by-product\* OR "food industr\*" OR "fish industr\*" OR “fish trader\*”) AND TITLE-ABS-KEY (prejudic\* OR ageism\* OR sexism\* OR homophobi\* OR racism\* OR xenophob\* OR gender OR equalit\* OR unequal\* OR inequalit\* OR inequit\* OR equity OR equitabl\* OR (empower\* W/3 women)) OR ((migrant OR immigrant\* OR visa OR visas) W/3 worker\*)

Medline search strategy:

Run 10th Oct 2022, 59 references downloaded

Database: Ovid MEDLINE(R) ALL <1946 to October 07, 2022>

Search Strategy:

--------------------------------------------------------------------------------

1 ((seafood\* or fish\* or ((marine or sea\* or aquatic\*) adj3 food\*) or crustacean\* or seaweed\* or mollusc\*) adj9 ((high adj3 pressure\*) or (pulse\* adj3 field\*) or dryer\* or convect\* or ultrasonic\* or microwave\* or osmosis or osmotic)).ti,ab. (681)

2 ((seafood\* or fish\* or ((marine or sea\* or aquatic\*) adj3 food\*) or crustacean\* or seaweed\* or mollusc\*) adj9 (process\* or cook\* or dried or canned or canning\* or tinned or tinning or dry\* or smok\* or froze or freez\* or salt\* or fillet\* or store or stored or storing or storage or cured or curing)).ti,ab. (12949)

3 ((seafood\* or fish\* or marine\* or sea\* or aquatic\* or crustacean\* or seaweed\* or mollusc\*) adj5 (oil\* or extract\*)).ti,ab. (27024)

4 ((seafood\* or fish\* or marine or sea\* or aquatic\* or crustacean\* or seaweed\* or mollusc\*) adj5 (byproduct\* or by-product\* or bio-oil\* or biooil\* or bioactive\* or (protein\* adj hydrolysate\*))).ti,ab. (2578)

5 1 or 2 or 3 or 4 (41514)

6 food industry/ or exp food handling/ or food-processing industry/ or exp food technology/ or food packaging/ (177514)

7 (process or processed or processing or packaging or preserve or preserved or preserving).ti,ab. (2134709)

8 6 or 7 (2277886)

9 (fish or fishes or seafood\* or aquatic\* or marine or sea or shellfish\* or seaweed\* or crustacean\* or mollusc\*).ti,ab. (438873)

10 exp Seafood/ (17191)

11 exp Seaweed/ (4703)

12 9 or 10 or 11 (444629)

13 6 and 12 (15530)

14 5 or 13 (53569)

15 prejudice/ or exp ageism/ or exp bias, implicit/ or exp gender equity/ or exp homophobia/ or exp racism/ or exp sexism/ or exp weight prejudice/ or exp xenophobia/ (35786)

16 (equit\* or prejudic\* or ageism\* or homophob\* or racis\* or sexis\* or xenophobi\*).ti,ab. (53512)

17 exp Health Equity/ (3050)

18 15 or 16 or 17 (80971)

19 14 and 18 (42)

20 exp "Transients and Migrants"/ (13721)

21 ((migrant\* or immigrant\*) adj3 worker\*).ti,ab. (2916)

22 20 or 21 (15120)

23 18 or 22 (95522)

24 14 and 23 (59)