

GenderWave

A digitool to support incorporation
of gender perspectives into marine research and innovation

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1. Gender in research and innovation

In the European Union, the [promotion of gender equality in science and innovation](#) has been an important objective for some time. Research and statistics, such as the [She figures](#) show that removal of discriminative barriers in academia still requires determined work. The improvement of the potential of women to have an impact on research and innovation is much needed. At the same time, scientific practices must change. Progress needs to be made towards more gender-aware science and innovation ([Kalpazidou Schmidt and Cacace, 2019](#)), otherwise there is a serious risk that research and innovation will fail to consider gender-based differences and/or that the outcomes are not equally relevant to all groups.

Research and innovation projects offer useful settings for the fostering of new practices. During the planning and specification of projects, it is possible to ask, for example, who can be expected to benefit from the project and its outputs, or for whom the findings are likely to be relevant.

In project management, gender needs to be taken into consideration at the different levels. This digitool seeks to support the integration of gender issues in *research and innovation content* (see [Figure 1](#)).

This perspective emphasises that, in projects, gender aspects should shape



the definition of
research questions
or innovation
objectives



the use of theories
and methods



design of a research
or innovation
process, including
public engagement
and dissemination of
the results

Figure 1: [Gender equality in research content and management](#)

➤ **Important elements to support gender equality (plans)
in research projects**

The following elements should be considered during all phases of the project (i.e., project planning, during operations, and during the reporting and dissemination processes):

Monitoring of the gender equality plan

- | | | | | |
|---|---|---|--|---|
| • Gender diversity among the project team | • Work-Life balance of the participants | • Equal opportunities to participate in scientific publishing | • Gender sensitive aspects of practical work (such as expeditions and laboratory work) | • Gender issues in the research content |
|---|---|---|--|---|

Communication and outreach strategies to promote gender equality

2. Aims

GenderWave is designed for the use of marine researchers and innovators. Marine science is understood here to include also social scientific and technical scholarship alongside with natural scientific research. The digitool provides means by which researchers and innovators can examine how their projects link to gender and promote gender equality.

GenderWave is tailored to be used as soon as a tentative project idea exists. When guiding project design, the tool can best support the development of gender-sensitive projects. Since project plans typically leave some room for project (re)design, GenderWave can serve gender integration also at the later stages of a project life-span.

GenderWave builds upon questions that aim to focus attention on the assumptions built into research and innovation. Critical pondering of these assumptions can lead to their modification and to the reconsideration of the project and its implementation.

After the project team or, for example, its coordinator, has gone through the different phases of GenderWave, and considered the different questions presented under the subsequent sections, it may be necessary to change the project to adopt different



a) analytical or innovative perspectives. For example, the project may modify its research questions or include more interdisciplinary content. The extensions or modifications can help the project to take gender better into account in different phases of innovation and knowledge production



b) concepts, classifications and data in order to be more sensitive to gender and issues relevant for gender-equality



c) modes of engagement. The project is made more interactive through networking or increased dialogue with the public. This can provide room for mutual learning and joint fostering of gender equality.

Why the focus on Marine Science and Technology?

Marine Science and Technology is traditionally a male-dominated field, with a significant lack of women in leadership positions. There is an urgent need for creating policies and implementing measures that utilise full human capital to tackle the social and environmental challenges. Therefore, the men and women alike are both needed to create innovative solutions to the degradation of the marine environment.

Read more: [The Baltic Gender project](#)



3. Why to read and use GenderWave?

Gender is seldom a dimension that can be mechanistically added on top of an existing project plan. Therefore, a tool is needed to support thinking about the ways a project links to gender and to promotion of gender equality. This exploration takes some time, but is worth the effort for the following reasons:

a) Increased accountability and ethical sensitivity

Marine research and innovation projects grant visibility to some topics, dimensions and interactions. At the same time other issues, perhaps relevant for some groups and actors, may remain unaddressed. Marine resource use and changes in marine ecosystems may affect men and women in different ways. Decision-making powers and capacities to act may also differ. Gender sensitive research and innovation can take into account such differences.

b) Increased scientific rigour; increased validity of the findings

The ignorance of gender-related differences may lead to a poor understanding of the phenomenon under analysis. This poses a threat to the validity of the findings of the project. Sensitivity to gender supports scientific rigor and the development of feasible innovations.

c) Better funding prospects

Gender-sensitive marine research and innovation projects have an edge over their competitors. Several funding agencies demand integration of gender analysis into project proposals. These include the European Commission and several national funding agencies such as the German Research Foundation (DFG). Increased accountability and validity are competitive assets, too.

4. What is gender? What is sensitivity to gender?

- Gender as a concept is typically used to highlight the difference between biological sex on the one hand, and the social and cultural condition of being male, female or neither, on the other hand. Gender as a condition refers to the norms, preconceptions, expression and traits that are associated to men or women. Gender is being constantly made. Therefore, attention must be placed on the ways gender is being produced along with knowledge and innovations.
- Gender thus refers both to categories (e.g. male, female, non-binary) and to processes in which these categories become made. Gender sensitive research may focus on women as affected groups. At the same time, it needs to be asked what is assumed by masculinity and femininity; and women's and men's concerns when they are grouped together by sex and treated as a single category.

→ This 'test' or game can help you ponder stereotypes at a general level:

<http://www.includegender.org/toolbox/exercises/an-average-man/>

- Since gender refers to categories that can be restrictive, it is important to ask whether marine research and innovation help to maintain the image of naturalness of dominant stereotypes, or whether research and innovation could rather help to show what these categorisations do, and how they are both resisted and maintained.
- Human capacities are constrained by norms and preconceptions, but also by material barriers. The conditions in which one is to make a living and to take care of one's health, for example, may vary between individuals and groups. Since marine research and innovation focuses on changes in material environments and circumstances, it deals with processes that may affect different genders in different ways.

5. GenderWave in practice

Integration of gender and gender aspects into marine research and innovation cannot be based on technical, ‘ticking of the boxes’, approach. This is because gender-related issues and concerns are seldom self-evident or immediately visible. They need to be actively explored.

- **GenderWave can be used by projects coordinators, teams and/or members to support their thinking.** It is useful to arrange a dialogue between a project representative and a person who adopts a role of a listener or a co-investigator. A dialogue between two or more persons supports pondering. **However, the tool can also be used by individual researchers or innovators alone. Depending how GenderWave is used, and how thoroughly the presented questions are examined, it takes from about 20 minutes to 2 hours to go through the digital dialogue.**
- **In the case of a dialogue or a team effort, decide who will make notes about the thoughts provoked by the questions. This helps to keep track of the concerns, proposals and decisions.**

GenderWave splits into four parts:

A. [The project and its societal landscape](#)

The first part encourages the mapping of the societal landscape of research and innovation projects. Gender and gendered differences are key features within the landscape.

B. [Research strategy](#)

This invites the project to examine how theories, methodologies, methods and data collection practices could better support gender-awareness.

C. [Innovation](#)

Here the focus shifts from research to the development of technical and social innovations.

D. [Towards conclusions](#)

Evaluation of lessons learned

The process starts with the description of the project (idea) and its societal context. This is followed by three sets of questions. In part the questions are connected so that more specific questions follow the more general ones.

Each of the three parts consists of questions in a chronological order. Altogether the tool includes 16 questions. Out of these,

- four are tailored specifically for projects that have even a small social or social scientific component;
- three are to support specifically the examination of innovation projects.

The questions are made up of the following components:

- ◆ *Introduction* describes the perspective from which the reader is asked to think about the project and its links to gender or gendered differences.
- ◆ *Ponder* opens up the actual question or questions for the project and its representatives to examine.
- ◆ *Examples* seek to help pondering by illustrating the issue.
- ◆ *Comments* provide additional information and guidance.

Now you are ready to [start](#) (p 11).

Phase A: Project and its societal landscape

Choose a) or b)

1. Are you studying, or developing innovation in relation to

a) a universal phenomenon that is not place or context specific (e.g. global ocean currents)	→ Move to Phase B (p 16)
b) a marine region or geographically bounded phenomenon?	→ Move to next question (p 12)



2. Characteristics of the research and innovation context

Introduction:

Your research or innovation project is placed in, or focuses on, a specific geographical and societal setting. Methodologies and methods of science are often expected to be universally adaptable. However, established approaches may include assumptions that do not hold everywhere. It is useful for any project to think over the societal context in which the project is envisioned to generate valid and relevant knowledge.

Example:

Typically, familiarisation to a research or innovation context must be based on documents and expert accounts. However, [Di Ciommo](#) (2007) presents an example of a 'Participatory Appraisal with Gender Perspective (PAGP)' that was used 'to identify the main aspirations of men and women with regard to improving their personal, community and environmental conditions', as well as to identify 'critical problems, and to understand how they affect men and women in their personal, domestic and public lives' (Di Ciommo, 2007: 61) in Corumbau Marine Extractive Reserve, Brazil. The findings show that the model of tourism promoted in the region generated burdens falling mainly on women. At the same time, access to capital goods and the job market was divided unequally, implying that women could not easily create independent careers.



Ponder:

What key characteristics of your research or innovation context you would raise as most important from your project point of view (e.g., history, livelihoods, inequities, political tensions)?

Name five features at the minimum. How can these characteristics be aligned to gender and gender-equality?

3. Connecting to the societal setting

Introduction:

Sensitivity to the societal setting supports the gender-awareness of research and innovation projects.

Example:

In a large international project analysing the vulnerability of South African coastlines, the mapping of the societal landscape encouraged the project to enlarge its focus from physical parameters to social ones. Vulnerability evolves distinctly in different groups and practices; therefore, men and women are affected to a different extent – and through different kinds of pathways. With the assumption that the most vulnerable groups do not have the means to adapt, climate change is likely to have gendered impacts. For example, women tend to be responsible for supplying fresh water for the family. Climate change related changes in fresh water availability in the region (in the form of increased drying or flooding) will probably have considerable consequences on the everyday practices of women as well as the place of residence for the whole family.



Ponder:

How does your project position itself in relation to its societal landscape? How have the features affected, or should affect, the project design?

4. Research and innovation for and with whom?

Introduction:

The position of a research or innovation project to a societal landscape – or seascape – should be also examined through the potentials the project has to promote change. There is also always a risk that a project unintentionally favours some actors and groups e.g. by building upon assumptions that take their privileged position for granted. New collaborators may offer fresh insights. Increased openness and reflexivity are likely to foster the robustness of your research. The conclusions and recommendations become more widely 'tested', too.

Example:

In fisheries, the division of labour between women and men tends to be highly differentiated. Men typically own the equipment and control production while women operate in processing and supportive tasks. Any research or innovation project focusing on resource utilisation, but neglecting gender as an organising category, runs the risk of reinforcing inequality.



Ponder:

May your project help to undermine or maintain pre-existing inequities? What do you need to find out about the situations and needs of women and men in order to ensure that the focus of your project is not unbalanced in favour of privileged groups?

Comment:

When selecting your project collaborators, it is useful to assess how the choices affect the abilities to promote gender equality. Collaboration can act as means to empower some groups or stakeholders. You may also wish to consider engagement of the public or some specific groups in knowledge creation. Doing so can help to integrate different forms of experiential expertise to project design and implementation. Moreover, diversity within the research community can help you to critically re-examine the starting points and assumptions guiding your research.

'...opening a community to wider participation as well as outside criticism increases the likelihood that some default assumptions are challenged in appropriate ways. The more diversity there is in a scientific community, the more likely it is that its default assumptions are challenged, and consequently either defended, modified, or abandoned.' ([Rolin, 2006](#): 135)



Phase B: Research Strategy

→ [Back to Phase A](#) (p 11)

5. Is your project

a) a research project	→ Move to next question (p 17)
b) one that aims at social or technical innovation?	→ Move to Phase C (p 29)



6. What counts as evidence?

→ [Back to the previous question](#) (p 16)

Introduction:

The theories and methods mobilised in research, guide 'what counts as evidence and explanation' ([Anderson, 1995](#): 29) in knowledge production. For gender-aware science and research, critical pondering of 'what counts' is essential. Research projects and processes necessarily exclude some variations and concerns. Even with the help of scientific methods, it is impossible to create an all-encompassing view. Gender-aware research accepts 'the located character of truth claims' ([Law, 2008](#): 634)

Example (1):

[Fisher](#) (2016) compares two projects that both examined social–ecological resilience in the context of New Zealand's marine environment. The projects theorised resilience differently and thereby built on different comprehensions about what counts as resilience-relevant evidence. The findings point to tensions between different methodologies.

Example (2):

[Chambers](#) (2009) describes a multi-method approach to study the population dynamics of a species of giant clam, pasua (*Tridacna maxima*) on the atoll of Tongareva (Penrhyn), Northern Cook Islands. She 'sought to utilise standard ecological research techniques (stratified random sampling, measuring and counting) alongside qualitative methods such as interviews with local knowledge experts, and focus groups concerning people's perspectives on how the pasua population had changed over time' (Chambers 2009: 198). This strategy allowed to generate a combination of two, equally partial, but mutually enriching, perspectives.

Ponder:

In your opinion, what are the most critical limitations of the theories and methods applied in your project? What potentially gender-relevant dimensions may they exclude? How can the project could best handle the issue (e.g. through the open articulation and even examination of the limitations, inclusion of other analytical perspectives)?

Comment:

Scientific concepts can include narrower or wider conceptions of relevant evidence ([Rolin, 2006](#)). Typically, narrow and precise definitions are valued over broader ones that leave room for context-specific interpretations of what is evidence and what is not. However, it is important to ponder what cannot be grasped with the help of the narrow definitions. Rolin (2006: 133) argues that the social processes that generate gender differences may gain little attention in research if the focus is solely on statistical trends. In marine science and research, it is also important to ponder how the definitions of relevant evidence correspond with and tell about the conditions in which people, and women in particular, live.

7. Towards sex and gender aware methodologies

Introduction:

Methodologies are embedded with assumptions about the differences and variations that count for the generation of knowledge. On the one hand, some exclusions are necessary: research needs a clear focus. On the other hand, methodologies and methods may be used routinely as a part of an analytical toolkit. When this happens, the modes in which variations – including gender differences – are regarded (ir)relevant can become cemented and naturalised. At worst, marine research operates in terms of systemic blind spots.

Example 1: Natural sciences:

Marine ecosystems are made of organisms with different reproductive qualities and characteristics. However, sex-based differences may be poorly taken into account in biological analyses. As noted by [Tannenbaum et al.](#) (2019: 137), ‘a review [[Ellis et al.](#) 2017] of experimental ocean acidification studies showed that only 3.9% of studies statistically assessed sex-based differences, while only 10.5% of studies accounted for possible sex effects by assessing females and males independently’.

Example 2: Social sciences and other research engaging with humans:

In research that involves humans, it is important to examine the assumptions the methods and methodologies make about humans in general, and of beneficiaries of research findings, in particular. Due to methodological choices, the relevance of the research findings can vary so that the findings apply and serve one gender better than others.

Research within marine products chemistry, for instance, must acknowledge the sex and gender related differences potentially affecting product safety and generalisability of the findings. The [EU Gendered Innovations](#) project and related work carried out at [Stanford University](#) provide several examples from other fields that remind that male bodies are too easily analysed as default models for human or animal organisms. The findings may then be relevant and applicable only for half of the human species.



Ponder:

On what grounds could anyone argue that your project dismisses sex-based differences or that your findings are not equally relevant for women and men? Can these arguments constructively be taken into account?

Comment:

Note that at issue here is not only the potential dismissal of some concerns at the cost of some others. What calls for attention are potentially gender-biased methodologies. Moreover, the problem may lay in societal objectives guiding the formulation of research questions. Science may be mobilised to serve social control and commercial interests in ways that neglect gender equality goals.

8. Does the project analyse humans (e.g. economics, practices, institutions) or human-environment relationships?

YES	→ Move to next question (p 19)
Human are not studied in any way	→ Move to Phase D (p 34)



9. Methods for gender-aware research

→ [Back to the previous question](#) (p 21)

Introduction:

In projects that study how people shape and live upon marine environments, the potentials for gender-awareness and promotion of gender equality are manifold. Gender can even be raised as a guiding analytical perspective so that a phenomenon is studied specifically from the point of view of gender roles and positions, for example. It may also be useful to use a multi-method design ([Chambers, 2009](#); [Nightingale, 2003](#)) that can provide alternative accounts, for example, of how livelihoods and ways of life depend on marine environments. Marginal, perhaps gendered, voices may become audible during such cross-exposure.

Example:

When studying coastal conservation in coastal Yucatán, Mexico, [Hanson](#) (2016: 468) focused on the analysis of women's oral histories. The findings provide a fresh account of the practices constitutive for coastal conservation. As Hansen argues: 'Women's collective identities as urban recyclers challenge the dominant gendered environmental relations ([Radel 2012](#)), which favor men's fishing and ecotourism activities as means toward coastal conservation and economic development. In a region where both urban issues and women's participation in conservation have long been excluded from policy and practice, women's collective organizing through recycling projects positions them as local professionals who positively influence urban sustainability in coastal areas.'



Ponder:

How gender as a specific analytical perspective could benefit your project? What complementary approaches and methods could be used side-by-side in your project to ensure that you can generate a rich account of the studied phenomenon?

10. Gender-aware engagement and data collection

Introduction:

Marine research projects with a social scientific background or component are bound to collect and analyse surveys and/or ethnographical data. Gender and gender-related differences should be taken into account in the design of data collection.

Ponder:

How could you ensure that data generation is sensitive to gender and gender-specific concerns? For example, how is gender considered in the design of surveys and ethnographic fieldwork?

Comment (1): Research indicates that diversity of informants is critical for the generation of gender-aware science. Biased selection of informants will generate biased understanding. For example, [Diamond et al.](#) (2010: 328) note that 'As a general pattern, men are believed to be the community members who fish offshore or in major inland water bodies, whereas women tend to fish or collect molluscs closer to shore. However, most fisheries researchers are men, most of their informants are males, and they often observe fishing activities only during the hours when men are working'. At the same time, it is important to pay attention to differences between gendered groups.

Comment (2): This toolbox can be used to help the design of surveys: <http://www.includegender.org/toolbox/map-and-analyse/gender-statistics/>.

11. Categorisation and stereotypes

Introduction:

Research that operates in terms of predefined interests and standpoints runs the risk of grouping people together without proper justification. This may lead to creation of stereotypes and to neglect of important differences.

Ponder:

How do the analytical categories you plan to use in your analyses link to gender? Can the categories be stereotyping? How could you respond e.g. to the observations that do not fit into the planned categories?

Comment:

Note that the treatment of women merely as victims is a stereotyping act, too. Doing so easily downplays the role of women as active change-agents.

12. Gender-aware research on resource management

Introduction:

Next you are invited to examine the target groups of your project. From the gender equality perspective, it is important to take into account how marine resource use and management distribute powers and wealth. However, the relevant dimensions to be considered depend on the perspectives from which people and their activities are studied. **Therefore, you are asked to mark the questions (a–d) relevant for you and answer the questions that follow.**

a) People engage in your project, or are analysed in your project, as users or managers of natural resources

Yes →

Introduction:

Marine resources may be more accessible for men than for women. Economic activities may also provide more direct income and benefit for men than women who often contribute to subsistence outside markets or in sectors that generate little market value. Leisure-time activities may not concern or interest men and women equally either.

Example (1):

In a marine research project willingness to pay for good environmental status was planned to be assessed based on the money used to recreational fishing. However, fishing is mainly a male hobby. Additional dimensions of valuation were therefore recognised as important.

Example (2):

Research shows that women's role in fishing supply chains can be underestimated. The ways in which information about fishing and the supply chains are reported leave women's input unacknowledged (e.g. [Fröcklin et al., 2013](#); [Harper et al., 2013](#))

Ponder:

What practices or activities are relevant for the study? What forms of work or resource use may be overemphasised or overlooked? For whom is this neglected resource-utilisation or resource-making important?

b) People engage or are analysed as conductors of and as potential contributors to coastal or marine spatial planning
Yes →

Introduction:

Planning processes provide access to some actors and stakeholders instead of others. If your analysis focuses or serves planning, it is valuable to ask how expertise and viewpoints of different genders can gain significance in and through planning. Likewise, the definition of that planning task affects which problems and solutions appear relevant. For example, non-commercial activities may be taken poorly into consideration.

Example:

‘Considering gender is relevant for any type of planning including natural resource use in general and coastal/marine in particular’, argue [de la Torre-Castro et al.](#) (2017: 63) in their paper about marine spatial planning in Zanzibar. The authors build their argument on the findings that show that men and women reached and used different parts of the seascape. This means that marine spatial planning may easily have implications that are gendered. In other words, by favouring some uses and activities, the plans may increase gender inequality.



Ponder:

How is gender taken into consideration in the design of the planning process and definition of the planning task?

Note: Research focusing on planning processes should also take a critical attitude to the actual role the plan comes to play in governance of marine resources. Plans with a vague formal status may end up having a merely symbolic impact despite of the high expectations they rise.

c) People are analysed in relation to marine governance networks and institutions

Yes →

Introduction:

Natural resource use and management can be dominated by men ([De la Torre-Castro et al., 2017](#)). Inequalities in power relations may also materialise as male-dominated expert networks. Dominance may manifest not only through the division of participants (male/female), but also through biased practices. Views and experiences of different genders may not reach equal standing.

Ponder:

What role does gender play for the practicing of power and authority in marine governance? What new dimensions about governance dynamics might become visible if the issue is studied from gender point of view?

d) People engage or are analysed as actors affected by environmental risks or deterioration of marine environment

Yes →

Introduction:

Sea level rise, floods and the pollution of marine regions, among other risks and hazards, affect some people and their subsistence more than others. Likewise, the capacities of groups and genders to cope with the changes differ.

Ponder:

How does or can your research design take into account the variations in people's vulnerabilities?

Example: [Fadigas](#) (2017) argues for the integration of gender vulnerability in the analyses of marine conservation and risk-prevention policies. It should be acknowledged that there are 'differences in the material reality of women and men and, consequently, in their specific involvement with the environment' (page 561). Her study of the Prestige oil disaster in Spain shows, among other things, that the shellfisher-women in Galicia she studied were hit more than the other fishers. The women were in a marginal situation from the start, and when the disaster occurred, they had few options other than to move to other shellfishery zones.

Phase C: Marine innovation

→ [Back to Phase B](#) (p 16)

13 Choose a) or b):

a) Your project aims at the creation of a social or technical innovation	→ Move to the next question (p 30)
b) Your project is not an innovation project	→ Move to conclusions (D) (p 34)

General introduction: Gender and innovation

Marine innovations may vary from aquaculture technologies and fish processing to shipping and maritime innovations. New resource extraction technologies and analytical devices also count as marine innovations. However, from the gender-perspective it is important to pay critical attention to the definition of an innovation. Not all creative outputs necessary are regarded as innovations. Research points to a self-sustaining circle: Men are more easily seen as innovators than women, and the outputs produced by men as innovations ([Blake and Hanson](#), 2004). It is argued, for example, that ‘open innovation is generally presented as a more inclusive and feminine approach to innovation’ ([Alsos et al., 2013](#): 245). Yet the aspirations to broaden the understanding of innovation in the university context result in a conventional representation of innovation and academic entrepreneurs as men ([Alsos et al., 2013](#); [Rönnblom and Keisu](#), 2013).

The relationship between innovation and gender can, and needs to be, examined through focusing on **innovation design**. Three interlinked perspectives can be differentiated in this regard (questions [14](#), [15](#) and [16](#)). When innovations are developed, the questions can help to improve the properties of innovations and innovation systems (including the distribution of innovation and access to innovation use) as well as to revise testing strategies.

14. End-users and beneficiaries

→ [Back to the previous question](#) (p 29)

Introduction:

Like research outputs, technical and social innovations are also developed to serve some purposes and end-users. However, the 'default' end-users may be people with specific qualities. The gendered assumptions related to end-users may not be fully acknowledged or negotiated during innovation development.

Two interrelated issues are relevant here. First, what and whose needs the innovation is to serve? This aspect points to the need to think innovation as demand-driven. Second, who can use and have access to the innovation, and on what conditions? In both cases gender can turn out to be an important differentiating and exclusive dimension.

Example:

[Collins et al.](#) (2019) introduce the idea of 'inclusive innovation' to argue for demand-driven approach to the utilisation of marine genetic resources:

'An "inclusive innovation" approach can represent an effective avenue to facilitate and promote enhanced engagement of all stakeholders in aspects associated with use of BBNJ [marine biological diversity of areas beyond national jurisdiction]. For example, engaging stakeholders with a wide variety of expertise during the innovation process could generate a feedback loop whereby progressively more benefits are generated and shared, more data become openly accessible and capacity grows at local and global scales.' ([Collins et al.](#), 2019: 2.)

The aim to support and empower women can also be a driver of innovation. In marine science, analytical devices can be developed to make sampling and observation practices less dependent on muscular strength. Technologies can also serve subsistence of women: 'It is well known that women represent about 70 percent of the poor and there are gender inequalities. Farming of marine mussels has been found to be a women-friendly technology in Kerala [India]' ([Kripa and Surendranathan](#), 2008: 200).

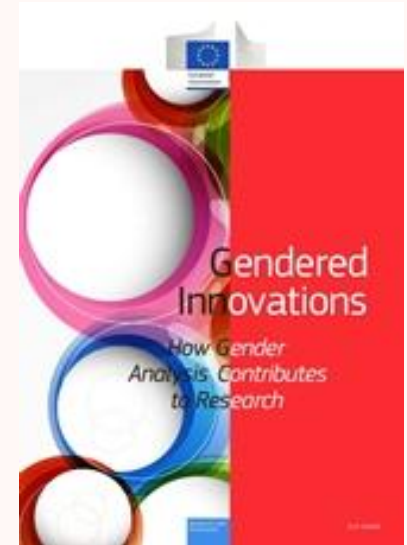


Ponder:

Who are the envisioned beneficiaries and end-users of the innovation?

How do the benefits divide, and/or can become divided, when the innovation is adopted? How could women and their needs be integrated into the innovation design? Can the innovation reduce inequalities? What specific skills and capacities are required from the end-users? Are men more likely to fulfil the requirements than women?

Note: 'Gender-aware' innovation can also be stereotyping. For example, when innovation design specifically seeks to address women's needs and to attract female users, at the same time it makes assumptions about and reinforces female tasks and roles.



The examples presented by [Gendered Innovations](#) illustrate what happens when assumptions about beneficiaries and end-users are not acknowledged when innovations are developed and tested.

15. Innovations as organisers of relationships

Introduction:

The functionality of a technological or social innovation demands that the innovation is implemented and used in a proper way. This may call changes in established practices and routines. New skills and modes of expertise may need to be adopted while some tasks, or even professions, are cut out of the picture. The innovation may also benefit or harm non-users who lose or gain access to specific places, resources, or data, for example. As a result, innovations do not just benefit some groups instead of others, but can also reorganise practices and potentially also gender relations. Prediction of these implications is difficult or even impossible, but it is important to examine the positions and relationships that need to become cemented for the innovation to work – and to remain maintainable and repairable. Innovations vary a lot in this regard, some of them being more adaptable and flexible than others.

Example:

[Kerr et al.](#) (2014) discuss in detail the specific questions related to the development and fostering of marine renewable energy. They note that '(n)ew technology offers both access to resources (e.g. fishing, oil and gas, aquaculture, marine energy, deep sea mining) and the ability to exercise control over marine space (e.g. radar, sonar, GPS, and satellite tracking). This underpins an on-going process whereby public rights and freedoms are supplanted by private rights, firstly by the creation of sovereign rights (e.g. Exclusive Economic Zones), then by the creation of private rights (e.g. sea bed leases, planning permission, and tradable quotas)'. The paper also has a useful 'check list' that can serve to examine the realisation and distribution of economic benefits (page 696).

Ponder:

How do the practices of the end-users need to change if the innovation is to be adopted? Whose support or 'co-operation' is needed to guarantee that the innovation operates as it is intended to do? Can this 'co-operation' be restrictive or harmful for some (gendered) groups? How may the innovation affect the division of work and responsibilities between men and women?

16. Risks and potential harm

Introduction:

The costs and benefits of innovations seldom divide equally. Therefore, in addition to benefits and their allocation, attention needs to be placed on the potential negative impacts an innovation may have.

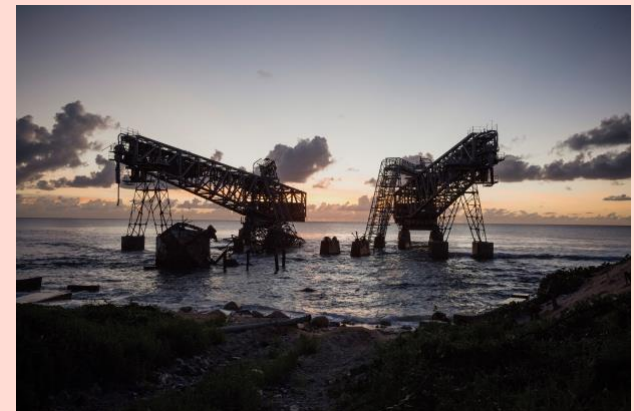
Ponder:

Can the innovation or its supporting elements cause harm to the users or any others? Which (gender) groups may be affected directly or indirectly? How will the harms and benefits divide between them?

When pondering the questions, it can be useful to set the focus separately on workers, users, local community, and value chain actors ([Basurko and Mesbahi](#), 2014).

Example:

Development of deep-sea mining equipment paves the way for resource extraction that may not benefit the populations that face the harms and the highest risks. [Fadigas](#) (2017) argues for the integration of gender vulnerability in the analyses of marine conservation and risk-prevention policies. It should be acknowledged that there are 'differences in the material reality of women and men and, consequently, in their specific involvement with the environment' (page 561). Her study of the Prestige oil disaster in Spain shows, among other things, that the shellfisher-women in Galicia she studied were hit more than the other fishers. The women were in a marginal situation from the start, and when the disaster occurred, they had few options to move to other shellfishery zones.



Note: [Responsible innovation guidelines](#) can provide support for your pondering.

Phase D: Towards conclusions

→ [Back to Phase C](#) (p 29)

You have now reached the end of GenderWave. At this point it is valuable to evaluate what your pondering has produced. How could your project generate knowledge that takes into account gender and gendered differences?

As indicated in the very beginning, a shift to increased gender-awareness may call changes in planned

- a) analytical or innovative perspectives. For example, the project may modify its research questions or gain more interdisciplinary content;
- b) concepts, classifications and data in order to sensitise better to gender and differences relevant for gender-equality;
- c) modes of engagement. The project is made more interactive through networking or increased dialogue with the public. This can provide room for mutual learning and joint fostering of gender equality.

One way to trace the learning curve is to return to [Phase A](#) and to [question 4](#) in particular. Do you think that you are, after going through the relevant questions of GenderWave, better equipped to ponder how your project relates to the world in which gender plays a role?

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