



Local Environment

The International Journal of Justice and Sustainability

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/cloe20>

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To cite this article: Zintle Sikhunyana & Syden Mishi (2023) Access, participation and socio-economic benefits of blue versus green economy: a systematic literature review, *Local Environment*, 28:12, 1552-1572, DOI: [10.1080/13549839.2023.2238748](https://doi.org/10.1080/13549839.2023.2238748)

To link to this article: <https://doi.org/10.1080/13549839.2023.2238748>



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Published online: 05 Aug 2023.



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Access, participation and socio-economic benefits of blue versus green economy: a systematic literature review

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ABSTRACT

There are implications to sustainable development from overconsumption of natural resources. Increasingly, economies are running out of resources to sustain or achieve desired growth rates and inclusive growth. As a result, momentum is building on exploring how the blue economy can be used as complimentary resource, particularly as a tapping into it as an opportunity of ensuring that the marginalised groups in society are catered for. This is argued to address the ex-ante inequalities in other sectors of the economy, such as the green economy (land and resources on it), where participation by vulnerable groups like women and youth is limited owing to segregation policies of yesteryears, at least in former colonised countries like South Africa. The study used a systematic literature review, following the Preferred Reporting Items for Systematic reviews and Meta-Analyses for Protocols (PRISMA-P) approach to ascertain works on this topic and identify gaps that need to be addressed to adequately inform policy and practice. With regards to access and participation in the blue economy, most studies found that women do have access and participate in the blue economy, however, their participation is limited by barriers such lack of education and credit as well as patriarchal beliefs. Furthermore, women participation in both green and blue economies is determined by social norms, skills attainment, access to credit, age, technology. Most of the reviewed studies concluded that men derived more commercial benefits from green economy, while women derive more subsistence and recreational benefits from the blue economy.

ARTICLE HISTORY


Received 12 May 2021
Accepted 20 June 2023

KEYWORDS

Blue economy; green economy; poverty; women; pecan economy; life on land; life under water

1. Introduction and background

The field of economics is broad, but the essence of economics theory stems from the philosophy of “resource scarcity”, which is a global economic challenge (Jayasuriya 2015; Kneese 2019; Porter and Richard 1965; Simpson, Toman, and Ayres 2005). The idea behind resource scarcity is that, given limited resources, there is a need to determine how best to allocate and use available resources efficiently (Aucamp 1983; Chenery and Kretschmer 1956). Such considerations are particularly necessary during times of shocks (e.g. the recent COVID-19 pandemic), when the ethics around the allocation of resources can be put into question (Moodley et al. 2021). The answer surrounding effective resource allocation depends on understanding the key roles played by the five factors of production, namely entrepreneurship, labour, knowledge, capital and natural resources (Musa 2017).

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The traditional economic theory, however, tends to pay more attention to the interplay between entrepreneurship, knowledge, labour and capital while leaving out considerations related to natural resources (Kneese 1988). This lesser emphasis on natural resources is due, in most part, to the (faulty) assumption that these resources are infinitely available and easily accessible (Tahvonon and Salo 2001). The theories and models of economic growth that were developed in the 1950s and 1960s (e.g. the classical theories), thus, failed to highlight the importance of monitoring the use of natural resources and is subject to great debate (Ravagnani 2008).

Natural resources are primarily terrestrial (i.e. referenced as the “green” economy in this study) and marine (i.e. referenced as the “blue” economy in this study) in nature and provide households – especially in the primary sector of dependent economies such as those found in low-income countries – with various forms and avenues for income, food, shelter and medicine (Robinson 2016). Since there is often no formal market responsible for allocating the services associated with natural resources it can lead to their overuse (Mohd-Shahwahid and McNally 2001). Robinson (2016) has, thus, noted that recent literature is increasingly addressing the competing demands placed on the (natural) resource base.

For a long time, terrestrial resources have been relied upon through the practices of farming, mining, hunting, wild fruits harvesting, herb gathering and others (Zhang and Chen 2022). However, increasingly, these resources are facing depletion or becoming less sustainable due to overuse (Zhang and Chen 2022). As a result, of late, the focus of human resource development and utilisation has gradually begun to turn towards the utilisation of oceanic resources – referred to as blue the economy (Taelman et al. 2014; Zhang and Chen 2022) given the extensive nature of oceans and that it creates new opportunities.

It should be noted that the blue economy refers to the exploration of ocean-based development opportunities with a vision towards environmental stewardship and protection (Lee et al. 2021). Martinez-Vazquez, Milan-Garcia, and de Pablo Valenciano (2021) note, however, that there is no clear definition of a blue economy; rather, the term is sometimes used interchangeably with “marine economy” or “ocean economy”. In addition, the blue economy covers three economic forms, namely economically coping with the global water crisis (McGlade et al. 2012), the innovative development economy (Pauli 2009); and the development of a marine economy (Behnam 2012). Wenhai et al. (2019) further posit that the aim of blue economy models is to shift resources from “scarcity” to “abundance”, and to start addressing issues that cause environmental problems. Conversely, the green economy often refers to life on land and how land-based resources are used in sustainable ways (Zhang et al. 2022). Access to any type of economy entails having access to economic activities and the related opportunities presented therein. By comparison, participating in an economy translates to the ability (and having the necessary tools) to exploit the opportunities presented.

Opening up new access to different set of resources, present an opportunity to re-set some inequalities in access, such as those driven by past beliefs and societal set-ups such as patriarchies. Galie et al. (2015) argue that the patriarchal beliefs that are common in Sub-Saharan African and Latin American countries often lead to gender gaps in respect to the ownership of resources; yet, equal ownership is considered key for increasing agricultural productivity, equity and food security. Productive resources, such as water, land, livestock and crops are all essential to the livelihoods of most of the world’s rural families, particularly in the Global South (Valdivia and Jere 2001). Despite such need, the majority of poor rural women living in the Global South often do not have the same level of ownership rights to these resources as their male counterparts (see for example Shaban 2022 for a collection of papers inequalities in Global South). It is further argued that there has not yet been much research conducted regarding local understandings of ownership, particularly in the Global South. In addition, research is also lacking about how concepts of ownership affect food security at the household level. The benefits of equal ownership have, furthermore, been well documented – with these benefits accruing over time through related improved productive efficiency and food security (Doss et al. 2014).

By contrast, the blue economy has started to take centre stage as an anchor for inclusive development, given the sea and its vastness (Kneese 1988; Toman 2003). The result has been that both countries and international organisations are presently actively developing various “blue economy strategies” in a bid to increase the production and trade of existing consumables related to

marine ecosystems (Fenichel et al. 2020). These strategies are aimed, specifically, to achieve the goal of a positive interaction between marine resources and economic development – at least to the extent that it is possible to integrate marine and terrestrial economic activities, as one may not be successful without the other (Yu, Chen, and Di 2023).

The potential of marine resources to unlock growth and development (Zhong 2019) under the blue economy banner (Martinez-Vazquez, Milan-Garcia, and de Pablo Valenciano 2021) depends, however, on infrastructure and other activities on land. For example, road and rail networks, telecommunications, as well as the manufacturing, mining and agricultural sectors all impact the blue economy and place large demands on harbours (see Ababouch 2015; Zhong 2019). As a result, Germond-Duret (2022) acknowledges that the notion of the blue economy has enabled the inclusion of the sea into general economic and development models alongside the green economy. This inclusion exists despite many segments choosing on what to place emphasis, especially across the three goals of environmental, economic and social improvements (Schutter et al. 2021).

The negative implications for sustainable development are, however, the result of the overconsumption of natural resources and the present lack of monitoring and evaluation policy regarding natural resources' use, fair access and utilisation (Schutter et al. 2021). The concept of the blue economy is, furthermore, recognised as central for sustainable development as it incorporates both socio-economic benefits and ecological conservation considerations (Okafor-Yarwood et al. 2020). This is especially true with reference to the recent past, when many economies recorded stagnant-to-no growth. By contrast, Wenhai et al. (2019) acknowledge the multidisciplinary nature of blue economic and the many terms and connotations associated with this particular sub-economy, which is unlike the terrestrial economy that has long been established. Despite these caveats, it is imperative to assess the current levels of access and resource utilisation present within these economies in order to access the greatest opportunities.

It should be noted that momentum is currently building towards exploring how the blue economy, which relates to the sustainable use of the marine resources that support economic growth and improve livelihoods, can benefit society (Wenhai et al. 2019). In particular, deeper investigations regarding the blue economy are taking place in relation to vulnerable coastal communities and specific sub-groups within such communities (Evans et al. 2023). As a whole, 70% of the earth is covered in water, which implies a significant resource with the potential to transform livelihood activities being abundantly available. The participation of marginalised groups, even those with clear proximity to the coast, is, however, not sufficiently known (Cohen et al. 2019); neither are the factors that determine such access and participation. With existing resources (mainly land) forming a cornerstone of livelihoods for the poor – albeit with great inequalities with regard to accessing these – it is imperative to do a timely assessment on the status quo of access and participation of varying groups in society.

At present, significant investment is flowing into the blue economy in a bid to help realise its potential of being a source for growth and development in the coming decades (Zhong 2019). In order for such growth to be a reality, there is a need to better understand the current level of access and participation in this sector. For example, it is necessary to determine if there is equal access as well as if all citizens have the requisite tools and capacity to actively derive livelihoods from the blue economy (without harming the environment or endangering themselves) (Evans et al. 2023). Societies such as those found in South Africa, which are endowed with extensive coastlines but are reeling from persistently high unemployment, high inequality, and an entrenched poverty-legacy left over from the Apartheid system could particularly benefit from the blue economy (Germond-Duret 2022).

South Africa has large ocean space (i.e. 2800km of coastline) as well as a large land area (1,213,090km²), which increases the potential of the country to invest effectively in marine endeavours so as to stimulate economic growth and development (Rogerson and Rogerson 2019; van Wyk 2015). The essence of the blue economy was already recognised as far back as at the beginning of the United Nations Conference on Environment and Development (UNCED) in 1992, where the UN confirmed a strategy for sustainable development and economic growth stimulation (Bari 2017). The concept of the blue economy was also then chosen as a term that would be used to rally resources and actions that could stimulate economic

growth, promote social inclusion, improve livelihood strategies, and promote sustainable development from and pertaining to marine resources (Okafor-Yarwood et al. 2020).

It is not, however, clear to what extent (or even whether) women, youth and other previously disadvantaged groups actually do take part in marine activities (Reva and Kumalo 2020). Enabling such disadvantaged demographics to partake in the blue economy could significantly address current inequalities seen in other sectors of the economy (e.g. as seen in the green economy), where participation by vulnerable groups such as women and youth tends to be largely limited (Ahmed and Kiester 2021). In a bid to promote vulnerable groups' ability to become participants in the blue economy, the South African government implemented Operation Phakisa in 2015. Through this initiative, South Africa looks to unlock the potential of marine resources, as the ocean is, for billions of people around the world, a life-support system – providing food, jobs and resources (Damanaki 2019).

Spanning economically important sectors, such as fisheries, maritime shipping, deep-sea mining, renewable energy and tourism, the potential return on investment in the blue economy is immense (Merayo 2019). Thus, it is of great policy and academic interest to consider the participation of women between the two sub-economies (i.e. blue and green) that exist within and across coastal communities. Okafor-Yarwood et al. (2020) have observed, however, that traditional livelihoods and small-scale local operations are often outcompeted by international corporations and government initiatives, with little to no regard for social inclusion and/or environmental sustainability. It is for this reason that the present study sought to “backtrack” and assess the past and present levels of access and participation by vulnerable groups (particularly women) in the blue and green economies (with an emphasis on the blue economy), as it is possible for vulnerable groups such as women, youths and rural communities to be readily side-lined when it comes to these economies; thereby sustaining the socio-economic ills that are currently inherent within (the South African) society (Lephakga 2017).

Economies, as a rule, tend to endeavour to combine the aforementioned resources in an attempt to create an economic surplus that can result in the growth of a country's (or area's) economy (Currie, Murphy, and Schmitz 1971). Such economic growth is, in turn, believed to result in the enhanced welfare for everyone living within the said economy. It is, however, imperative to note that the indicators of economic growth (often listed as gross domestic product [GDP] growth) and development (i.e. GDP per capita) have their limitations (Kumar and Castro 2018). Most notably, some elements – such as the sea – have been missing from the accounting of these indicators yet the potential contribution is significant (Loureiro, du Plessis, and Findlay 2022). A key limitation is, then, that inequality cannot be readily measured (or, thus, addressed), since not all factors are taken into account (Trapeznikova 2019). In many societies – especially with respect to the previously colonised – there are also various *ex-ante* and *ex-post* inequalities that need to be given attention (Brunori, Palmisano, and Peraginez 2015; Tshabalala, Anakpo, and Mishi 2021). There are, in particular, two issues of concern with regard to this approach: (1) seeking economic growth, particularly in developing economies, has placed (natural) resources under significant strain, which has led to a general concern for the future (Booi, Mishi, and Andersen 2022); and (2) measures and policies pertaining to access and participation still preclude specific (vulnerable) groups, such as women (Anderson and Barbier 2012), of which for the case of South Africa, hope is pinned on National Development Plan and Operation Phakisa with focus on inclusivity (Loureiro, du Plessis, and Findlay 2022).

Existing studies are limited on assessing access and participation by various groups within society and/or to what extent such varying groups benefit from the blue economy (Martinez-Vazquez, Milan-Garcia, and de Pablo Valenciano 2021). As such, there is a great risk of those extracting resources from the ocean being concentrated to a select few (Viridin et al. 2021). Furthermore, there appears to be a dearth of enquiry into the level of access and participation by different groups in the “new” blue economy in a bid to address the widely identified inequalities present in the “old” green economy and/or to enable redress through the practice of inclusive growth. Based on these gaps in the extant research, this present study opted to offer a systematic review of the available present literature on the topic, as such a review could help researchers and other relevant stakeholders to better understand, in comparison, the level of access and participation in, as well as socio-economic benefits

derived from, the two main (blue and green) sub-economies. Given the paucity and discord of the present literature on this topic, however, the present study aimed to conduct this systematic literature review in a bid to better identify the major themes currently addressed by researchers as well as important issues that are currently missing from the research. The study also sought to highlight any consensus (or lack thereof) across the extant literature – the findings of which could serve as a springboard for more research into important topics present within this broader area of research.

In all, the primary objective of this study was to systematically review existing literature on the blue and green economies in order to assess what has already been done in relation to the concepts defined in this section. Such a review could help guide future empirical works in the area by harnessing what has been presented in the currently available literature.

2. Materials and methods

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols (PRISMA-P) approach (Page et al. 2021a) was used to conduct the systematic literature review presented in this study. Specifically, the PRISMA-P approach was used to review literature pertaining to women versus men's access to, participation in, and socio-economic benefits from both the green and blue economies. The PRISMA-P was chosen due to its ability to improve the quality and conduct of systematic reviews (Moher et al. 2015). This approach is also often used to facilitate the preparations and presentations of robust protocols for a systematic review (Moher et al. 2015).

2.1. Study design

This study aimed to investigate the access, participation and socio-economic benefits derived by women versus men in the green and blue economies. To that end, a systematic literature review captured data from past studies relevant to the research topic and a critical analysis of these data constitute the findings presented in this paper. It should be noted that the literature review was restricted solely to academic literature (i.e. journals and full-text theses). The inclusion and exclusion criteria for what literature was ultimately included for review is summarised in Table 1.

Various keywords were used to search for relevant literature for review. These words were combined in different ways using: “and”, “with”, “versus”, “in”, “within”, and/or “by”, as appropriate, in order to ensure a comprehensive collection of relevant literature. Table 2 provides the list of key phrases and search terms used to gather the literature that was ultimately reviewed in this study.

Among the research strategies used to locate relevant literature for the review was conducting search like Google Scholar, Ebscohost as well as manual searching in University library.

2.1.1. Study selection

The studies selection process was conducted by following the PRISMA-P method (see for example, Page et al. 2021b). That is, the following four key concepts were used as a guide in the study's selection process in order to find the most relevant literature to be included in the systematic review:

- identifying records highlighted from search engines (note: in the case of the present study, all identified records were accessed via Google Scholar and JSTOR and captured in the PRISMA-P);
- conducting screening in order to remove any duplicate data gathered from different search engines (note: in the case of the present study, the screening process excluded all studies not written in English, all studies that have not been peer-reviewed, all studies undertaken in non-social sciences fields, and all complete abstracts);
- confirming eligibility by only including full papers relevant to the research topic and
- including studies that contain their own complete analysis (note: in the case of the present study, those studies that did not include a methodology and/or data analysis sections were not included; neither was “grey” literature).

Table 1. Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Is addressing either access, participation, and or socio-economic benefits of the blue and green economy	Does not make reference to the blue economy (and variants in terms)
Is in English language	Is in non-English language
Is available in full	Only abstract available
Is in peer reviewed output	Is part of grey literature or no evidence of peer review
Published in year 2000 to current	published prior year 2000

2.2. Data

The data were extracted using the PRISMA-P approach diagram (Figure 1). A total of 19 studies were ultimately included for analysis. The selection of these 19 studies was based on the systematic process followed above. The data and findings pertaining to these reviewed studies are discussed in this paper. It should be noted that this present study only considered data from the year 2000, as the true challenge of gender inequality has only really been receiving attention since the new millennium (see Shang 2022). The focus of the review was on analysing the *status quo* since such awareness and efforts to address the noted challenges have come to the fore so as to begin closing the extant gap in current literature.

Table A1 in the Appendix offers a full summary of the included studies, while Table A2 in the Appendix details the countries covered in the selected studies.

3. Findings

Content analysis was conducted in order to analyse the collected data and produce findings that aligned with the broad concepts of: access to the blue versus green economy, participation in the blue versus green economy, and the socio-economic benefits of the blue versus green economy. Themes were then identified under each of these broad concepts. Upon reading and analysing the selected studies, the key findings were established, as per the following sub-sections.

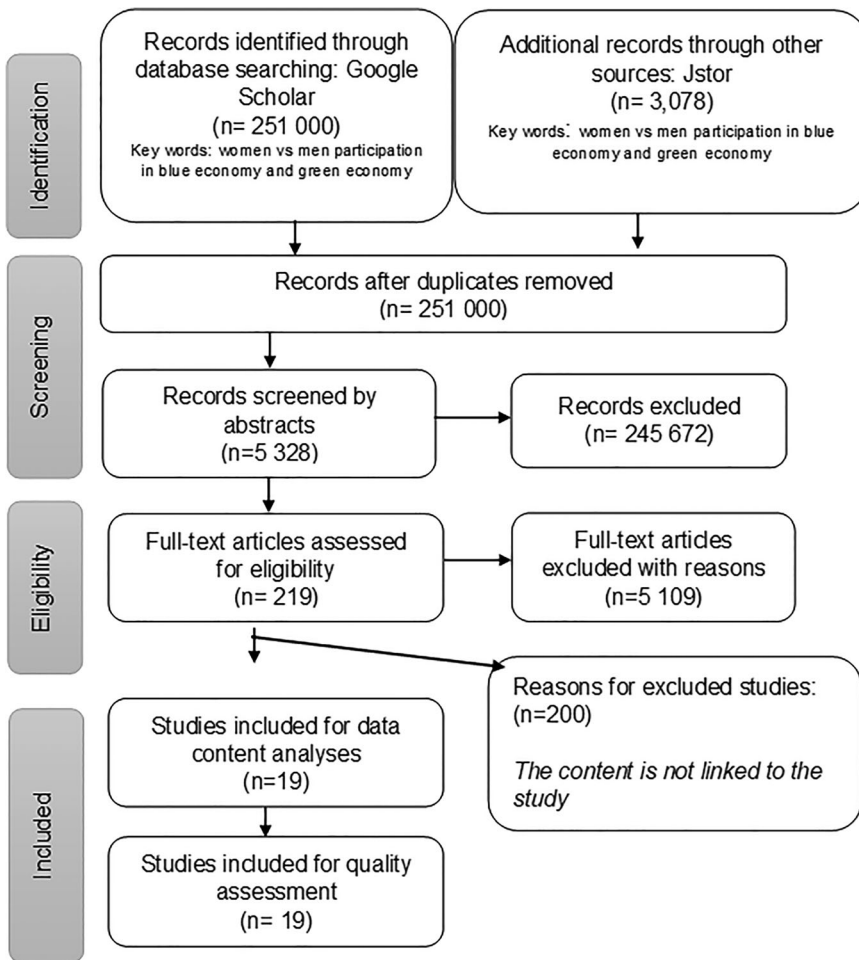
3.1. Access and participation in the blue economy

Based on a review of the literature, the following points were established:

- Female participation may be confined to certain activities;
- Women are present in the marine economy, including at the managerial level;
- Female participation in fishing is limited by barriers such as restricted education, credit access, and so forth; and
- Skilling and empowerment aimed at improving the participation of women in blue economy exists.

Table 2. Key works and search terms.

Terms/phrases	Joined search phrases
Access; green economy; blue economy; women; men; participation; socio-economic benefits	Access to the green economy Access to the blue economy Participants in the green economy Participants in the blue economy Socio-economic benefits in the blue economy Socio-economic benefits in a green economy Green and blue economy



Flow Diagram: PRISMA flow diagram of the study selection process

Figure 1. Selection of articles following the PRISMA protocol.

Based on the key findings listed previously, it is clear that women's access to the blue economy is often limited to certain activities (i.e. is partial), with skills, education and access to credit playing a critical role to this groups' access as well. Culture also plays a significant role, as there are cultural barriers present, especially in relation to access – women are often considered inferior to men in African culture, and fail to compete aggressively for access. However, benefits for women, drawn from the blue economy, can also be culture-based, such as collection of sea shells for cultural beadworks that are sold for a living. In order to support socio-cultural factors in the economic ecosystem, Shen et al. (2015) confirm that people living in different countries and areas can be influenced by different cultural norms that, in turn, impact their readiness to engage in volunteer activities, or to donate money to support specific measures that promote an open ocean ecosystem (less restrictions means better access even to those without money for license). This particular conclusion comes from Shen et al.'s (2015) study on Japanese residents and their intentions to engage in marine conservation activities.

Marginal willingness to pay (WTP) for open ocean services was also found to be a contributing factor to access in respect to marine-related activities (Shen et al. 2015). It should be noted that Shen et al.'s (2015) analysis was based on the attributes of location (i.e. urban versus rural settings), annual income, age and gender. From the review, it is evident that demographic factors

such as age, income and gender (amongst others) have a significant impact on individuals' access to as well as the role of both economies in alleviating poverty (Nagoli, Binauli, and Chijere 2019). This is especially true for individuals functioning within a set of gendered social relations (Nagoli, Binauli, and Chijere 2019).

In studying women's role in fisherfolk communities, the existing literature indicates that there is a link between access to estuary-related activities and the availability of resources (Roy and Utpal 2012). The Roy and Utpal (2012) study also confirms that limited access to resources, limited access to input and credit, inadequate technical competency, poor participation in decision-making, and limited exposure to mass media are often limiting factors for fisherwomen, specifically. Although the latter conclusion might contain gender bias in that women are at a disadvantage of accessing many things such as finance, leadership role et cetera, it also proves that there is some relationship between the availability of necessary resources and women's access to the ocean economy.

Income disparity was also found to worsen existing gender-inequality and further hinders access. Per one reviewed study, such worsening can be largely seen in developing countries, such as India, where women dominate the labour force but still face extreme disadvantages in terms of wages, land rights, and representation in local farming organisations (Slathia 2015). Thus, notably gender relations have raised much controversy and continue to do so in some parts of the world. The review further found that while women constitute approximately half of any country's population, in most countries, they contribute much less than men towards the value of recorded production, both in quantitative terms (i.e. through labour-force participation) and in qualitative terms (i.e. in educational achievement and skilled manpower) (Oladejo, Olawuyi, and Olawuyi 2011).

The economic value and sustainability of natural resources are, additionally, determined by the policies implemented to protect them (Sataloff, Johns, and Kost 2011). Maximising the value of natural resources for sustained growth and development, and avoiding the resource curse, thus requires policies that formalise and codify revenue management procedures. For example, as early as 1988, South Africa has had in policies – such as the National Water Act of 1988 – to reduce the overconsumption of fish stocks and other natural resources in estuaries (Rogers 2011). To protect natural resource consumption such as fish, governments often also require fisherman to have paid-for licences. The acquisition of such licences may, however, cause exclusion, as some people (particularly those of vulnerable groups) may not be able to pay the license fee. There are also taxes attached to the sales of fish; hence, governments around the world tend to use revenue collected from issuing fishing licences as well as from the sale of fish to provide public goods and services at a more commercial than subsistence level (see Booi, Mishi, and Andersen 2022).

Pollution and poor sanitation in fishing villages or fish landing sites have also been counted as barriers to women's access and participation in fishing. For example, the review of one study found that, in Malawi, fishing communities often report a prevalence of bilharzia and cholera, both of which normally originate from poor sanitation (Nagoli, Binauli, and Chijere 2019). These incidences of bilharzia were high – reaching to as many as 45% across various fishing villages. Such high incidences could be attributed to the fishing industry management by health officials, which is compromised by the mobile nature of fisherfolk and worsened by a general lack of sanitation facilities such as latrines. Women can therefore not be out on sea for long as conditions are not favourable to them, or they fail to support their basic sanitary needs – making it exclusive for man.

From a policy standpoint, the literature review found that the mainstreaming of ecosystem services has resulted in the creation and application of given frameworks (Oteros-Rozas et al. 2014). Such frameworks are used not only an educational concept to raise public interest concerning biodiversity conservation and human dependence on ecosystems but to also increase the quantification of ecosystem services as potentially marketable commodities. In South Africa, subsistence fisheries are largely localised and involve very small numbers of fishers with low values; however, they are still important in the context of livelihoods (Lamberth and Turpie 2003). Therefore, in line with an ecosystem services framework, management strategies within the South African context must concentrate on maintaining maximal productivity of resources if benefits are to be maintained.

3.2. Access and participation in green economy

The following themes emerged under this sub-topic:

- Female participation in agriculture is improving, but is still dependent upon women's access to inputs, marital status, household size and cultural norms;
- Some constraints exist with respect to female participation, including, but not limited to: no land rights, poor payment and/or representation in organisations, water shortages, a lack of skills, and high input prices; and
- General male participation in agriculture is declining

The reviewed studies indicate that participation in the green economy offers improvements for women wellbeing, but that such improvements are still heavily determined by a woman's marital status, household size, adherence to cultural norms (e.g. patriarchal beliefs), and skills. Economic factors such as input prices as well as access to other resources such as water also determine the benefits of this economy on women. A number of authors (e.g. Agarwal 1995; Meinzen-Dick et al. 2011) were found to have, therefore, argued that securing women's rights to resources is one key way to enhance their welfare, growth, equity and empowerment, particularly in regard to their involvement in the green economy.

In analysing women's participation in the agriculture age, household size, marital status, level of education, years of experience in the activity, cooperative membership, and level of participants' income were all found to have a significant impact on their ability to access and participate in both the agricultural and oceanic economies (Damisa, Samndi, and Yohanna 2007). The understanding of gender relations in aquatic ecosystems can, furthermore, unveil gender-based opportunities and constraints along the value chains of ecosystem services (Nagoli, Binauli, and Chijere 2019).

Assigning contributions to agricultural outputs by gender is, however, problematic, as in most agricultural households both men and women are involved in crop production (Doss et al. 2011). Farming has also been largely used as a women's empowerment tool in many forms (e.g. through agriculture cooperatives). Some initiatives aimed at increasing access and participation in farming were also found to not yield the expected results (Diiro et al. 2018). For example, the Diiro et al. (2018) study, which compares female-managed plots to male-managed plots as well as to jointly owned maize plots, revealed that female-managed plots tend to be less fertile and receive a lower intensity of fertilisers relative to the other plot-manager-type categories. The review found, however, that these differences could lie in the quantity of input resources varying significantly between female- and male-owned plots.

Apart from gender inequality, the review also found that women tend to face many other challenges due to limited access to productive resources in the agriculture sector, which prevents them from enhancing their productivity (Slathia 2015). As indicated earlier, without limitations individuals' can use their discretion to choose whether or not they want to participate in and/or benefit from both the green and blue economies to enhance economic surpluses. Gender as well as age factor, which was specifically highlighted in a study conducted by Thangwana (2009) often reveal the inequalities. Thangwana (2009) investigated trends in women's participation in agriculture at a single irrigation scheme based in the Limpopo province of South Africa. The study found that older people in the investigated village were concerned that young people do not have an interest in farming and that this might mean that there is no future for the scheme. In addition, it was noted that people from neighbouring villages might come in and take over land production, since the younger generation within the village in question tended to prefer taking off-farm jobs.

Another challenge is unemployment and illiteracy – which are problems more pronounced among women,¹ which can encourage many people to depend on subsistence farming and fishing. The low educational level and few employment opportunities are factors that are directly related to the high degree of dependence on fishery resources in some parts of the world (Rocha

et al. 2012). High dependency on one type of resources also create vulnerability to shocks, should that sector be impacted in any way – making those dependent on it worse off.

3.3. Socio-economic benefits of blue and green economy

- Women value “open ocean” approaches when compared to men (i.e. women see more benefits within the blue economy than men do);
- Women function more in regulatory services of the blue economy, while men dominate the livestock industry in the green economy; and
- Female mostly participate for own consumption and income generation (non commercial) within the blue economy compared to male dominating the commercial sphere

The reviewed studies also indicated that women tend to value open ocean activities more when compared to men. Such findings hold the potential to assist in addressing current inequalities, especially if women can gain the necessary support to access and participate in the blue economy. In addition, it was found that women generally benefit more from the regulatory nature of the blue economy, which inherently creates a peaceful environment that supports relaxation and general enjoyment (i.e. through the process of engaging in outdoor work activities). By contrast, men were found to dominate the livestock industry and see more value from and in such activities (which also tend to more for commercial use), with women participating more in the blue economy (primarily for own consumption and personal income generation).

Services in both economies should, however, not be assessed solely by focussing on the biophysical and economic dimensions of their value but by their socio-cultural benefits as well (Oteros-Rozas et al. 2014). This behavioural aspect of evaluating the value of both economies indicates that no neutral or generally accepted ideology can effectively measure the value of either the blue or green economy in isolation, as such evaluation would be subject to individuals’ preferences. Any other factor(s) that shape(s) attitudes and perceptions regarding the value placed on the blue or green ecosystem can also be incompletely filtered.

In addition to regional and demographic factors, livelihood was found to be a key determinant in women’s ability to access and participate in either the blue or green economy. The reviewed literature confirmed that women generally access and participate in the respective economies in order to sustain their livelihoods – whether as a sole source or as a form of diversification. It is also well established that many developing countries depend primarily on agriculture for their livelihood (Khan et al. 2012; Slathia 2015; Thangwana 2009). An important aspect of such livelihood maintenance relates to provisioning services, such as of food. For example, in one reviewed study, it was confirmed that in Japan, as well as in many other East-Asian countries, seafood is captured through deep-sea and offshore fishing activities and that this seafood then becomes a common part of their cuisine (Shen et al. 2015). On average, the same study found that the Japanese population consumes approximately 57kg of seafood per year (Shen et al. 2015), making it a lucrative market. By contrast, developing regions, such as Pakistan, India and South Africa depend largely on the green economy, highlighting the untapped opportunity provided by the blue economy, and women, given low representation in the other sectors of the economy, can take up this opportunity.

Access to resources is, furthermore, imperative in order for women to participate in various livelihood activities as well as for developing their capability to harness other livelihood options by diversifying their activities and earning avenues (Hamza and Hudu 2015). Access to financial resources is also especially important for an individual’s ability to participate in cash-crop production (Zakaria 2017). The phenomenon of gender inequality in labour participation in agriculture in general, as well as in cash-crop production in particular, is disturbing, as it significantly hinders women’s economic empowerment (Zakaria 2017). Such gender-based hinderance is especially concerning when

considering that agricultural income continues to be the primary source of income in most rural economies, particularly in the developing world (Zakaria 2017).

4. Discussion

Based on the reviewed literature, marine fisheries are acknowledged as a key economic and food security source, with approximately 300 million people across particular countries being dependent on marine fisheries as their primary, if not sole, livelihood strategy (Food and Agriculture Organization [FAO] 2016). The UN's sustainable development goals (SDGs) pay closer attention to expanding economic benefits in developing and undeveloped countries through the sustainable usage of natural resources (World Bank & United Nations Department of Economic and Social Affairs 2017). In order to meet the UN's SDGs, it is necessary, therefore, for marine resources to be effectively managed across various sectors – estuaries, tourism, aquaculture and other ocean-related activities. Oceans' resources, in particular, resources form the base upon which the economies of many developing countries depend, and are crucial to "their culture and sustainable development, to poverty reduction, and to achieving the Sustainable Development Goals" (World Bank & United Nations Department of Economic and Social Affairs 2017). Furthermore, in order to achieve the sustainable management of estuaries, in particular, there is a need to understand the socio-economic importance of recreational fishery (Welcomme 2001). It was imperative therefore to assess access and participation of women in this economy, compared to any alternative to enable sustainable development and inclusive growth, globally.

It was found, however, that many emerging economies continue to fail, at least to some extent, to notice the social and economic importance blue economy and, as a result, governmental structures are often not developed sufficiently to cater to specific activities (Arlinghaus et al. 2016). With comparison to developed countries, these have a long history of participation in multiple activities – subsistence and recreational, which means that they tend to have good governance structures, policies, laws and regulations (Arlinghaus et al. 2016; FAO 2012). The fishing industry has also been noted as a growing sector, and reliance on food gained from fishing – particularly with regard to raw catches – has a long history in coastal areas across South Africa for subsistence and recreation (Hosking 2011). It should also be noted that land use was the primary source of income and food for many households in rural areas before South Africa gained its independence; with the oceanic resources less explored. The access to and utilisation of land has seen greater inequalities to the disadvantage of women; hence the hope that new activities exploring the oceanic resources open opportunity to include women.

As noted previously, the global challenge of poverty is especially prevalent amongst women due, in large part, to their socio-economic status. That is, on average, male-headed households are considered better off than households headed by women simply due to how men, generally, have greater economic opportunities than women (Munhenga 2014). Diversification of livelihood strategies has, therefore, been promoted as an effective strategy to alleviate poverty; women can therefore diversify into blue economy if accessible is possible and help reduce poverty (most households are women led) and women access to income has greater impact on poverty (Wei et al. 2021). That is, by enabling better access to natural capital can determine more effective livelihood strategies (Mishi et al. 2020) in line with the Livelihood Sustainable Framework (LSF) (Department for International Development [DFID] 1999). Access to land as well as land size, thus, determines a household's available livelihood strategies (Scoones 2009). By understanding the benefits of both marine and land resources, then, these resources can be better targeted by policymakers in a bid to bridge the current gender inequality and associated poverty and, thereby, promote poverty alleviation, employment creation, fiscal revenue generation and economic development. For decades, women have been discriminated against with regard to land ownership and use; however, there is now growing relevance and acknowledgment of the blue economy and its potential in redressing such discrimination.

The findings also confirmed that effective management of the natural resources present within the blue economy can promote general economic growth, the improvement of livelihood strategies, and social inclusion of vulnerable groups (World Bank & United Nations Department of Economic and Social Affairs 2017). The rationale behind the blue economy is, thus, based on the decomposition of socio-economic development activities, with the aim to categorise the different activities according to ocean-related sectors and to identify environmental and ecosystem activities that may promote degradation (UNCTAD 2014; UNDESA 2014). The analysis of marine resources and land use in South Africa has not, however, been given much attention as a strategy that can be used by policymakers to stimulate economic development and alleviate poverty – an attempt to categorise activities (decompose), may help guide policy making. Policies that are aimed at ensuring the efficient use and management of natural resources can have a significant impact on economic development and poverty alleviation (Sataloff, Johns, and Kost 2011), which makes effective policy creation vital for ensuring better gender-specific access to socio-economic services and the benefits that can be gained from the two sectors.

In general, natural resources play two significant roles in the economy (Hamilton et al. 2006). Firstly, these resources function as the basis of subsistence. Secondly, these resources can provide a source of governmental finance. With regard to the basis of subsistence, natural resources serve as a vital safety net for poorer households through the provision of food, subsistence agriculture and wildlife animals (Hamilton et al. 2006). Natural resources can also contribute towards fiscal revenue in the form of income from sales; which, in turn, contributes towards poverty reduction (Sataloff, Johns, and Kost 2011; World Bank & United Nations Department of Economic and Social Affairs 2017).

The government can also collect revenue from the consumption of natural resources, with poorer communities also being able to access these resources and/or benefit from governmental aid based on these resources so as to improve their livelihoods (Hamilton et al. 2006). Marine fisheries further contribute towards the global GDP – to the value of over US\$270 billion (World Bank 2012). Stocks of natural resources are also often used to adjust the balance sheets of national accounts as well as the flows of natural resources as inputs to production (Hamilton et al. 2006). In other words, both current and future economic growth and development emanate from revenue generated from natural resource consumption. The current consumption of natural resources serves, therefore, as a determinant of investment for future economic growth, economic development and poverty alleviation.

5. Conclusion

There is increasing attention being directed towards various ecosystem services and how they can promote access, participation, and benefits to humans. Both the blue and green ecosystems face major threats due to factors such as climate change and pollution. Despite the negative factors, however, these ecosystems can still be effectively utilised to generate both direct and indirect benefits to the human population and women in particular. Some such benefits could be monetary in nature, while others could promote generally improved wellbeing for those participating in each economy. Access to both the green and blue economy has also been proven to be affected by factors stemming from gender relations.

Female participation in the green economy was found, in this study, to be improving. However, the access and participation of women in the green economy remains significantly lower to that of men, particularly due to women still being excluded from many key aspects, such as land rights. By contrast, the study confirmed that women do have better access and exhibit greater participation in the blue economy. Despite the better findings in this particular economy, women's participation is also still limited by barriers, such as the acquisition of fishing licences. Female participation in both the green and blue economies can, thus, best be determined by social norms, skills attainment, access to credit, age and technology.

The study further noted that people participate in both the green and blue economies primarily for their own consumption and/or to make sales. With particular relation to the blue economy, various reviewed studies confirmed that estuaries are an especially attractive option as they open up economic opportunities of both a subsistence and a recreational nature.

In order to better understand the disparities that are current present in gender relations regarding both the green and blue economies, it is imperative to assess the socio-cultural aspects that shape the communities in which these economies operate. In addition to the social construction of gender, demographic factors such as age, gender, income level, education and employment determine the perception held about (women) participating in (either) the blue or green economy. Essentially, direct participation was found to yield monetary benefits for participants in either economy, which, in turn, led to improvements in the greater local or national economy. The availability of resources to participate in both or either economy was also confirmed as being a key to improving livelihoods. The blue and green economies can, thus, be used as an engine for growth and poverty reduction in and for those communities that are actively involved therein. As such, policy and environmental management goals need to be directed to efforts that maximise the productivity of resources in both economies.

Further empirical works are needed to better assess the nature of activities taking place in these systems, as well as how other groups aside from women (e.g. youth) access and participate in the two economies in question. The better quantification of the economic value of marine, estuary and general ocean resources is also required, especially with regard to a country like South Africa that has vast coastline yet struggles with multiple social ills such as inequality, unemployment and poverty, as it is believed that the blue economy holds potential to address these issues.

Note

1. <http://atina.org.rs/en/illiteracy-poverty-and-unemployment-are-major-causes-social-inequality>.

Acknowledgment

The author of this paper would like to thank the Research, Engagement Innovation Fund (REIF) Fund, offered by the Research Development Capacity at Nelson Mandela University, for funding this research.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by Research, Engagement Innovation Fund (REIF) Fund which is a non Open Research Fund; offered internally by Research Development Capacity at Nelson Mandela University.

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Appendix

Table A1. Summary of the included studies.

Primary focus of paper in relation to topic	Number of articles
Green Economy	5
Participation in Green Economy	1
Socio-economic benefits	1
The blue economy and green economy	1
Women and men in the green economy	1
Women in the blue economy	6
Women participation in and socio-economic benefits from the blue economy	1
Women participation in the blue economy	3

Table A2. Summary of studies reviewed.

Literature Review							
Author	Year	Title	Theme	Problem Statement	Methodology	Findings	A geographic area or focus
Damisa, Samndi, and Yohanna	2007	Women Participation in Agricultural Production: A Probit Analysis	Green Economy	Women role in agriculture has been underestimated and the role of women contributed to the economy has not been recognised	Qualitative: Interviews and Structured Interviews	Women's participation in agriculture has improved. Findings further showed that women's participation in agriculture can improve more if the inputs that are required in farming such as technology can be easily accessible.	Nigeria
Oladejo, Olawuyi, and Anjonrin	2011	Analysis of Women Participation in Agricultural Production in Egbedore Local Government Area of Osun State, Nigeria	Green Economy	Lack of access to resources deprives women of participating in agriculture	Qualitative: structured interview schedule	Women's participation in the green economy is improving over the years. What determines women's access to agriculture is marital status, household size, and local taboos.	Nigeria
Slathia	2014	Participation of Women in Agricultural Production	Green Economy	Women role was not recognised and women are still excluded in terms of having land rights, payment, and representation in farming organisations	Qualitative: Analysis of empirical literature review	Women's participation in agriculture has improved. Findings further showed that women are still excluded in terms of having land rights, payment, and representation in farming organisations	India
Thagwana	2009	Trends in Women's Participation in Agriculture at Tshiombo Irrigation Scheme, Limpopo Province	Green Economy	Women engage in farming at Tshiombo Irrigation Scheme, but land control or management of the area is under men authority	Mixed methods: analysis of empirical literature review documents, surveys_semi-structured interviews, and quantified open-ended questions	Participation of men in agriculture is declining whereas women dominate in farming. The findings were also that even though women dominate in farming, women have challenges of water shortage, high input prices, and also that they do not have the marketing skills to market their products	South Africa_ Limpopo Province
SOFA Team & Doss	2011	The Role of Women in Agriculture	Green Economy	The value of women in food production is not known and	Quantitative research method_ secondary data from Agricultural Labour Force	The findings showed that women participation in agriculture constitute about	World

(Continued)

Table A2. Continued.

Literature Review							
Author	Year	Title	Theme	Problem Statement	Methodology	Findings	A geographic area or focus
Diiro, Seymour, Kassie, Muricho, & Muriithi	2018	Women's empowerment in agriculture and agricultural productivity: Evidence from rural maize farmer households in western Kenya	Participation in Green Economy	their level of participation in agriculture is not known. Empirical evidence acknowledged that the role of women in agriculture is lagging behind that of men due to gender inequality which resulted in unequal access to resources such as land, education, and livestock amongst others	Statistics and Time use surveys Quantitative research method: instrumental-variable regression method. Cross-sectional data	43% of the worldwide agriculture labour force The findings were that women empowerment increased the productivity of women in agriculture and as result, some farms are managed by women	Western Kenya
Khan, Sajjad, Hameed, Khan, and Jan	2012	Participation of women in agriculture activities in district Peshawar	Women in the green economy	Women are more than 50% of the world population and they make a significant contribution towards production and management activities, but their role has been undervalued and unrecognised.	Interviews were used to collect data	The findings showed that women participation in agricultural harvest is low in relation to men	Pakistan
Humera, Tanvir, Munir, and Muhammad	2009	Participation Level of Rural Women in Agricultural Activities	Women in the green economy	Understanding the role of women in homestead is one of the crucial aspects for development initiative of the country	Data was collected through interviews. Statistical Package for Social Sciences (SPSS) was used to analyse the data	The findings were that women participation in agriculture is only significantly higher in seed cleaning and vegetable harvesting	Pakistan
Simango	2015	An Assessment of Women's Participation in Agricultural Production: A Case Study of Marange Irrigation Scheme in Zimbabwe	Women in the green economy	Cutoff	Mixed research methods: structured questionnaire, semi-structured individual interviews and observation were used to collect data	The findings were that women participation in farming is high, and low in extension programmes	Zimbabwe
Zakaria	2015	The Drivers of Women Farmers' Participation in Cash Crop Production: The Case of Women Smallholder Farmers in Northern Ghana	Women in the green economy	Lack of information regarding the assessment of gender participation in the labour market	Qualitative research method: Survey	The findings were that women's participation in cash crop production amount to one-third in relation to men's participation. The main reason for less participation of women in agriculture is due to the low participation of women in household decisions and also lack of access and control over	Ghana

Adam and Zakaria	2015	Determinants of Female Labour Force Participation in Farm and Non-Farm Livelihood Enterprises: The Case of Female Labour Participation in Northern Ghana.	Women and men in the green economy	Importance of understanding women participation in agriculture to solve issues of poverty	Qualitative research method: Survey	household productive resources The findings showed that men dominate in crop production. Low women's participation in crop production is due to social norms.	Ghana
Cele	2003	Women in the Maritime Sector in South Africa: A Case Study of the Durban Unicity (specifically, the national ports authority and the South African port operations).	Women in the blue economy	Challenges faced by women in the maritime sector	Surveys and literature review analysis	The findings showed that women do participate in marine activities and they are also in a managerial position	South Africa
Nagoli J., Binauli L., and Chijere A.	2018	Inclusive Ecosystems? Women's Participation in the Aquatic Ecosystem of Lake Malawi	Women in the blue economy	Ecosystem services are used to understand gender social relations and also a strategy to alleviate poverty, but women participation in fishing is limited and as a result, women lack access to resources that contribute to the production of fishing	a structured questionnaire, focus group discussions, key informant interviews, and observations	Findings showed that women make a significant contribution towards fishing, however, their participation is limited by barriers	Malawi
Lamberth & Turpie	2003	The Role of Estuaries in South African Fisheries: Economic Importance and Management Implications	Socio-economic benefits	Estuaries require optimal sustainable management due to their contribution and usage towards economic growth, therefore it is imperative to analyse the full economic value of estuaries	Secondary data from the National Marine Linefish System (NMLS) database, the Netfish System database. Analysis of literature review (paper publications and reports). Surveys multivariate models were used to analyse data.	The findings showed that estuaries contribute towards inshore marine Fisheries and in return improve economic growth	South Africa
Torre, Hernandez-Velasco, Rivera-Melo, Lopez & Espinosa-Romero	2019	Women's Empowerment, Collective Actions, and Sustainable Fisheries: Lessons from Mexico	Women participation in the blue economy	Implementation of sustainable fisheries required collective actions, however, gender equality has been missing in the analysis, and the role of women in fishing has been given less recognition	Qualitative research method: Analysis of government reports; programmes, and analysis of 5 case studies from small-scale fishing communities	The findings showed that women's participation in fishing has improved because of women's empowerment and skills attainment.	Mexico

(Continued)



Table A2. Continued.

Literature Review							
Author	Year	Title	Theme	Problem Statement	Methodology	Findings	A geographic area or focus
Rocha, Santiago, Cortez Trindade, and Mourao	2012	Use of Fishing Resources by Women in the Mamanguape River Estuary, Paraiba state, Brazil	Women participation in and socio-economic benefits from the blue economy	In coastal areas, women's participation in income-generating activities is main affected by the management of marine resources. Understanding how marine resources are managed to determine the livelihoods of women	Mixed methods: interviews, direct observations, and corrected principal use concordance	Out of 30 women that were interviewed, the findings showed that 30% of them participate in fishing and agriculture, while others focus only on fishing. The findings also showed women participate in fisheries for their consumption and sales.	Brazil
Roy	2012	Women's role in fisherfolks' communities of Hooghly Estuary	Women participation in the blue economy	Women's role and participation in the blue economy have been given less recognition. There is a need to understand women role in fisheries to reduce the challenge of inequality	Qualitative research methods: semi-structured schedule interviews	The findings showed that, out of 400 participants, 62% of women participate in fisheries. The results also revealed that other women who are not participating in fisheries are because of lack of education, credit, and inability to make decisions.	West Bengal, in India
Shen, Wakita, Oishi, Yagi, Kurokura, Blasiak, and Furuya	2015	Willingness to pay for ecosystem services of open oceans by choice-based conjoint analysis: A case study of Japanese residents	Women participation in the blue economy	There is limited literature in assessing the challenges of exploring how the open ocean is used by women and men	Qualitative research method: a choice experiment	Based on 3 open ocean ecosystem services (fish production, carbon dioxide absorption, and water purification) that were used to investigate the willingness for ecosystem services from 814 participants, the findings showed that women have high willingness to pay for open ocean service than men.	Japan
Oteros-Rozas, Martin-Lopez, Gonzalez, Plieninger, Lopez, & Montes	2014	Socio-cultural valuation of ecosystem services in a transhumance social-ecological network.	The blue economy and green economy	Ecosystem services have been used to study human-nature relations but how studies that have been conducted, few studies have looked at socio-cultural preferences of ecosystem services	Qualitative research method: questionnaires	From 416 participants, findings showed that women participate more in regulating services whereas men participate more in work-related in raising livestock.	Spain