

Different Stakeholder's Perspectives on Cultural Ecosystem Services: A Case Study of the Anzali Wetland, Iran

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Abstract: The study investigates local level environmental conflict between two groups of stakeholders, by analysing their opinions about the importance and use of the cultural ecosystem services of the Anzali Wetland in northern Iran. Data were analysed statistically on the basis of semi-structured interviews with 193 respondents from (a) administrators within the areas of forestry, agriculture, environment, and harbour, and (b) non-administrators, i.e. local people such as fishermen, hunters, and visitors. The results showed that there was a difference between the two groups of stakeholders regarding use of, and attitudes towards cultural services in the wetland. The sense of belonging to the place, and the importance of the cultural heritage were cited as more important among the non-administrators. They also used the wetland more for activities such as sports, social activities, fishing and hunting, while the administrators appreciated the wetland more for the enjoyment of its beautiful natural scenery. The locals used the wetland practically, while the administrators saw the importance of the wetland in more abstract terms. The study highlights the importance of assessing viewpoints of a variety of stakeholders, and including also cultural values in decision-making about ecosystem services.

Keywords: Ecosystem Services, Cultural Ecosystem Services, Stakeholders, Anzali Wetland.

INTRODUCTION

Nature promotes human well-being; however, human behavior and decisions about nature may have profound effects on ecosystems (Daily, Polansky, Goldstein, Kareiva, Mooney, Pejchar, & Shallenberger, 2009). In debates about ecosystem services (ES), nature is seen as having beneficial properties with a positive impact on human well-being. The Millennium Ecosystem Assessment (2005) defined ES as the benefits humans can obtain from an ecosystem. These benefits include both tangible, material benefits such as provisioning services (i.e., food, raw material), and intangible or immaterial ones like cultural services (relaxation, recreation, aesthetic enjoyment), regulating services (climate change, water regulation, etc.), and supporting services as a supplementary class (Balvanera, Pfisterer, Buchmann, He, Nakashizuka, Raffaelli, & Schmid, 2006; Costanza, de Groot, Sutton, Van der Ploeg, Anderson, Kubiszewski, & Turner, 2014; Fisher, Turner, & Morling, 2009).

As part of a new emerging discourse, ES have achieved far-reaching attention for the incorporation of ecological, economic and cultural values into decision-making and planning (Chan, Balvanera, Benessaiah, Chapman, Díaz, Gómez-Baggethun, & Luck, 2016; Saarikoski, Jax, Harrison, Primmer, Barton, Mononen, & Furman, 2015). However, the importance of cultural values is often neglected in these analyses. In order to achieve truly sustainable socio-ecological systems, it is central to understand how individuals perceive and value their surroundings (Kittinger, Finkbeiner, Glazier, Crowder, 2012). The term cultural ecosystem services (CES) refers to the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences (Millennium Ecosystem Assessment, 2005). The cultural aspects of ES highlights non-material benefits of nature, which have mental (and perhaps also physical) effects on people. An understanding of CES requires the consideration of viewpoints from

different social groups. Therefore, in order to achieve more equitable welfare policies, one has to gain an understanding of what ES means from different stakeholders' perspectives, and identify their core values, especially non-market benefits (Chan, Satterfield & Goldstein, 2012; Gómez-Baggethun, Barton, Berry, Dunford, & Harrison, 2016; Kenter, Reed, Everard, Irvine, O'Brien, Molloy, & Collins, 2014).

The focus of this work is on cultural ecosystem services (CES) in the Anzali Wetland in Iran. ES as such are related to promoting biodiversity, but cultural values are connected to communities and societies, even to core values. Therefore, the participation of different stakeholders in the ES discourse has been proposed as a potential solution for overcoming the uncertainty and complexity of the environmental issues. Many researchers have argued that such participation would increase the quality of decisions by allowing holistic perspectives and facilitating negotiation about conflict areas (Reed, 2008). The participation of more stakeholders requires consideration of who they are and what benefits they will bring to the decision-making process. The World Bank (1996) defines participation as "a process in which stakeholders influence and share control over development initiatives and the decision and the resources which affect them" (World Bank Participation Sourcebook, 1996). Stakeholders can be defined as individuals, groups, or even organizations which are affecting the decision-making process and who are being affected by the decisions (Reed, 2008). In this research, everyone who has some interest in using the Anzali Wetland is considered as a stakeholder.

Stakeholder participation is more related to cultural ecosystem services and non-material values than only provisioning. An example is provided in the 'structure-function-value-chain' framework, which refers to the fact that functions will be turned into service when humans realize their values and benefits. Therefore, recognizing benefits is highly dependent on context, values, and space (Haines-Young & Potschin, 2010). As far as the evaluation of values associated with the physical surroundings are concerned, either it is a question of tangible or intangible values, the locals are likely to be the best experts. Empirical investigations have to take local stakeholders into account in recognizing and mapping values, benefits, and services. For example, Tyrväinen, Mäkinen, and Schipperijn (2007) in Finland mapped the value of urban woodland by a participatory approach, which was based on the accurate local knowledge about the distribution of services in urban green spaces. Fagerholm, Käyhkö, Ndumbaro, and Khamis (2012) also emphasized the local stakeholders' knowledge in evaluating forest services in Tanzania. Their results showed that local stakeholders were experts in identifying the distribution of both material and non-material benefits. Citizens' perceptions about the values of their natural surroundings, especially intangible ones, are of central importance for political implementations. Accordingly, engaging interest groups in identifying different and specific values would help to negotiate and contain conflicts. Sarkki (2017) suggests that participation has an impact on human well-being by providing social interaction and collaboration. It also gives more opportunity to empower stakeholders in decisions related to ES (Sarkki, 2017). It seems that different stakeholders' involvement is essential not only in the decision-making process, but also for natural resource management (Saarikoski, Turkelboom, & Kaune, 2016). Darvill and Lindo (2015) studied ES, especially CES, among seven different stakeholder groups in a watershed with a hydrological dam development in Canada. Their results identified the importance of different types of CES such as aesthetic values, and also a sense of belonging to a place, among stakeholder groups (Darvill & Lindo, 2015). Raymond, Bryan, MacDonald, Cast, Strathearn, Grandgirard, and Kalivas (2009) noticed that the local stakeholders of the Murray-Darling basin valued their regions not only for biota, land, and water, but also for other assets such as community values, sense of place, family relations, and recreation.

Overlapping values in some regions, or differing interests among different stakeholders, especially in the case of multiple users, increase the risk of conflict (Ruiz-Frau, Edwards-Jones, & Kaiser, 2011). This fact highlights the issue of the legitimacy of the

decision-making process, which has to represent multiple stakeholders' viewpoints. Ruiz-Frau et al. (2011) found that regions which were ecologically important for stakeholders also had cultural values, such as heritage and leisure benefits. Castro, Vaughn, Garcia-Lorente, Julian, and Atkinson (2016) showed that different stakeholders had different preferences for protecting marine ecosystem services in a conflict zone (Kiamichi, USA). They proposed those investigating different stakeholders' attitudes aids in the prioritizing of services; it helps in dealing with conflicts, and it also clarifies the economic and cultural consequences of specific services. Spotting the priorities on ES categories clarifies conflict dimensions and facilitates the negotiation process.

Therefore, a thorough CES discourse may clarify the dimensions of the environmental challenges in Iran, and the prevailing unsustainability which have increased social and political instability. Among the various environmental challenges in Iran, water is a controversial field which has created conflicts between different stakeholders and governance. These conflicts have occurred between sociocultural structures and actors with conflicting needs, desires, and goals, a fact which makes compromising and negotiating difficult. According to the global water discourse, a water crisis is usually the combined result of poor governance and neglect of the civil society on behalf of the private sector, and, furthermore, neglecting to take water shortage into account. (Tropp, 2007). Scientific research in Iran has identified five triggering factors as the main causes for the aquatic challenges: governance, developmental patterns, population growth, political factors, economic factors, and climate change (Mandani, 2014). Therefore, the Iranian water crisis is caused by poor water governance, with the presence of diverse groups of stakeholders who have not been integrated into the decision-making process, and the existence of a top-down hierarchy (ibid.). Apart from the lack of influence on decision-making, failures to reach an agreement between stakeholders, due to their different interests, have made the water crisis in Iran complicated. The complexity and dynamic of environmental issues have shown the necessity of establishing a transparent and flexible decision-making process, which includes a wide range of knowledge, both local and scientific, and an integration of different discourses (Hage, Leroy, & Petersen, 2010; Luyet, Schlaepfer, Parlange, & Buttler, 2012; Reed, 2008).

The aquatic ecosystem of the Anzali wetland in Iran is a good example for identifying the presence of different stakeholders with diverse values.

The Anzali Wetland

The Anzali Wetland is located to the south-west of the Caspian Sea, in the Gilan province, with an area of 1500 hectares. This wetland is one of the biggest fresh water basins in Iran. The basin is fed with an input of 11 main rivers, 30 subsidiaries and two Output Rivers which run into the Caspian Sea. The Anzali Wetland is an aquatic ecosystem with a capacity for preserving 150 species of birds, 432 types of fish, different animals, amphibians and different herbs (Jaygaah, 2004). It is globally known as a landing zone for migrating birds, and it is also recorded in the Ramsar Convention on Wetlands from 1975. In following years, it was listed in the Montreux Record of wetlands for being partly destroyed by human activities (ibid).

The economic values of the Anzali Wetland are related to activities such as fishing, hunting, and business-related recreation. A significant number of the local people are involved in fishing and hunting, which is important for the local economy. The annual fish catch is about 400 tons, and the potential market value is about 10 billion Rials. Approximately 100,000 birds are hunted per season, and their potential market value is approximately 3 billion Rials. In summer, the wetland provides recreational activities for many visitors, including motor-boating and kayaking. The number of visitors to the wetland is estimated at about 40,000 per year. Most of the visitors use boats, and they spend about 3 billion Rials per year. The wetland also has a huge potential for ecotourism activities in the form of environmentally sustainable use of natural resources (Ghahraman & Attar, 2003).

One special feature of the Anzali Wetland is the accessibility of raw materials for handicrafts and industrial goods. These artificial creations are important for attracting domestic visitors (Dadras, 2010). In general, the Anzali Wetland provides the following functions, from ecological to cultural ones:

Unique views and biodiversity (a vegetative area for plants and suitable habitat for fish, water birds and mammals). These are related to provisioning services.

Conserving the area against flood.

Climate control.

Being a water reserve (especially for irrigation of paddy fields and fish pools). Prevention of the entrance of sediment inflow from the mountains, cities and urbanized areas to the Caspian Sea.

Commercial fishing and hunting.

Tourism and ecotourism; the wetland has great potential to attract tourism during 6 months of the year, from March to December.

Social functions (job creation).

Scientific research (zoology, biology, and environmental studies).

Cultural heritage sites (traditions and handicrafts).

During the last three decades, the impact of human activities and the manipulation of the wetland were so severe that it started to dry up. Studies show that until 50 years ago, the ecosystem of the wetland was in balance. But with the increasing growth of the population, especially at the upstream of the wetland (in the Rasht province), and due to some wrong policies, such as the construction of a canal-based ecosystem, lead to vast destruction (Akbarzadeh, Laghai, Monavari, Nezami, Shokrzadeh, & Saeedi Saravi, 2008). Pollution from human, industrial, and agricultural activity is delivered to the wetland by rivers, especially the one which passes through the Rasht City. A study has shown that Rasht city only in 1998 produced 1.34 m³ untreated sewage which entered into the wetland (Tavakoli & Sabetraftar, 2002). Apart from pollution, some other strains on the wetland are caused by a wide range of stakeholders, such as hunters, fisheries, tourism, agriculture, and small industrial companies; furthermore domestic visitors, or in other words, groups who do not feel that they belong to the wetland, but who are visiting for fulfilling some interests; the lack of interest from managers, planners and policy makers, who neglect to take other stakeholders' opinions into account; the lack of responsibility of some stakeholders for the future of wetland, and the conflict between the interests of decision-makers and other stakeholders, and economic problems of some groups.

The first aim of this study is, to investigate whether there are any differences between two groups of stakeholders over the use of the Anzali Wetland. A second aim is to identify which categories of ES are important for these two groups of stakeholders. Finally, a third aim is to identify which benefits of CES are important for these two groups. With a total of 193 respondents, as representing a group of administrators, and the group of non-administrators.

METHOD

Sample

The research was conducted in the Anzali city. Of a total of 193 interviewees, 82 were administrators (43%), and 110 (57%) were non-administrators. The administrators were chosen randomly from agricultural administration, forestry, environmental, harbour and fisheries, cultural heritages, and public administration. The non-administrators consisted of fishermen, hunters, visitors, and small shopkeepers around the wetland selling goods such as handicrafts, or having cafeterias, motels, or restaurants. The percentage of men who participated in the study was 55%, with women being 45%. The majority of respondents had a Bachelor's degree (83.3%); it should be noted that all participants in the administrators' group had a Bachelor's degree, since it is a requirement for being employed in governmental administration. Having a Bachelor's degree was equally distributed for the two genders.

Interviews

The interviews were carried out from the beginning of September to the end of October 2017. They were semi-structured, and covered the following nine areas of ecosystem services: how important the respondents considered the wetlands to be for the sake of (a) their own sense of belonging to the wetland; (b) for the removal of anxiety and depression; and (c) for sports activities. Furthermore, the interviews covered how much the respondents used (visited) the wetland for various reasons, such as for (d) bird hunting as a sport; (e) visiting just for having fun; for (f) the beauty of the natural scenery, (g) provisioning services (as a food source); (e) regulating services (water regulation); and for (f) social recreation. The respondents also had to assess, on a five-point scale ranging from 0 (not at all) to 4 (very much) how important they considered the wetlands to be, or how much they used it for these specific reasons. The scores were transformed into z-scores, in order to ensure comparability of variance.

Results

The mean values and SDs (in z-scores) for the nine variables of the study are presented in Table 1. The three first variables pertain to the perceived importance of various CES, and the following six variables pertain to the actual use of various CES.

Differences between Stakeholders Regarding the Perceived Importance of Various Forms of CES

A multivariate analysis of variance (MANOVA) was performed in order to investigate possible differences between how highly the two types of stakeholders evaluated different forms of CES. According to the MANOVA, the multivariate F was significant [$F(7, 183) = 2.01, p = .05, \eta^2 = .071$]. The univariate analysis showed that non-administrators scored higher than administrators on the sense of belonging to the wetland [$F(1, 190) = 10.07, p < .001, \eta^2 = .053$], on the importance of the wetland as a remover of depression and anxiety [$F(1, 190) = 4.29, p = .038, \eta^2 = .022$] and the importance of the wetland for sports activities [$F(1, 190) = 3.49, p = .056, \eta^2 = .024$]. For means and SDs, see the first three variables in Table 1.

Table 1. Means and SDs (in z-scores) for Administrators and Non-administrators on the Nine Variables of the Study

	Non-administration		Administration	
	M	SD	M	SD
Importance				
Sense of belonging to the wetland	.07	1.05	-.12	.91
Removing anxiety and depression	.13	1.08	-.17	.85
Sport activities	.11	1.08	-.15	.86
Using (visiting)				
Visiting for bird hunting as a sport	.15	1.08	-.20	.86
Visiting for fun	.20	.95	-.16	1.0
Visiting for the natural scenery	-.12	1.05	.16	.91
Provisioning services (food source)	.21	1.04	-.27	.86
Regulating services (water regulation)	.11	.90	-.15	1.1

Social recreation	.22	.98	-.16	.98
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Differences between Stakeholders Regarding Visiting the Wetland

t-test revealed that non-administrators visited the wetland more often than administrators [$t(190) = 3.564, p < .05$]. This difference may be related to the dependency of their life on the wetland for food or income.

Differences between the Two Types of Stakeholders Regarding the Use of Different Types of CES

A multivariate analysis of variance (MANOVA) was conducted with type of stakeholder (administrators vs. non-administrators) as independent variable, and how much they used six different types of CES as dependent variables. The results are presented in Table 2. As the table reveals, the non-administrators scored higher than the administrators on most of the variables [bird hunting as sport; visiting for fun; provisioning services (food source); regulating services (water regulation); and using the wetland for social recreation]. The administrators scored higher only on the variable, "visiting for the natural scenery".

Table 2. Multivariate Analysis of the Use (by Visiting) of Cultural Ecosystem Services of the Anwali Wetland among Two Groups of Stakeholders, Administrators and Non-administrators (N = 193). For Means and SDs, see Table 1.

	F	df	p≤	ηp2	group differences
Multivariate analysis	2.30	1, 190	.012	.123	
Univariate analyses					
Visiting for bird hunting as a sport	6.35	1, 183	.012	.033	non > adm
Visiting for fun	6.63	"	.010	.035	non > adm
Visiting for the natural scenery	4.06	"	.044	.021	adm > non
Provisioning services (food source)	11.30	"	.000	.059	non > adm
Regulating services (water regulation)	3.40	"	.050	.018	non > adm
Social recreation	7.28	"	.004	.013	non > adm

DISCUSSION

The effect of ecosystems and biodiversity on human well-being gives reason for societies to preserve nature better than before. A thorough understanding of these effects helps to identify which services are relevant for different stakeholders (Klain & Chan, 2012). As this study shows, ecosystems are evaluated differently by different stakeholders due to the fact that they vary in their needs and interests. The incorporation of such preferences – which requires knowledge about them – paves way for a reduction of conflicts between users. The inclusion of different groups of stakeholders in the decision process is, therefore, necessary for a correct evaluation of ecosystem services (Lamarque, Tappeiner, Turner, Steinbacher, Bardgett, Szukics, Lavorel, 2011). The difference between stakeholders in the present study highlight some features of Iranian environmental management.

The research shed light on non-monetary preferences of two types of stakeholders of the Anzali Wetland at the local level. The results indicate that there is a gap between the perspectives of these groups. The gap between them shows different interests, perception, and even usage of the wetland, a fact which complicates negotiation. This result also corroborates Mirzajani, Babai, Abedini and Dadi's (2003) findings about the difficulties

regarding negotiation between the various Anzali interest groups. The results indicated that provisioning and regulating services such as using the wetland for food provision, and water regulation were important services for non-administrators, while none of them were seen so important for administrators.

Among the CES, the sense of belonging to a place and receiving non-material benefits such as improving mental health, relieving stress, and performing activities such as walking, jogging, or canoeing are some non-material benefits that non-administrators receive from the Anzali Wetland. This result is also explainable due to the fact that they visit the wetland more than non-administrators, and feel more connected to it. The sense of belonging to the wetland is related to social interaction such as visiting for family or social events, and recreational activity, which all have an influence on human well-being. Gilanian local respondents pointed out that the Anzali Wetland was a part of their identity. Moreover, the cultural heritage of the Anzali Wetland was significant among older generations and non-administrator groups with lower educational degrees. The interconnectedness of cultural heritage and sense of belonging underlines the importance of the wetland at the local level for the group of non-administrators, especially its relation with provisioning services. This research finding is consistent with Kalternborn, Linnell, Baggethun, Lindhjem, Thomassen, and Chan's (2017) study on the interdependency of CES such as a sense of belonging to a place with provisioning services. In the current research, the provisioning capacity of the Anzali Wetland in providing food (fish and sometimes birds) was important for non-administrators with low educational levels, which is in line with Martin-Lopez's (2012) results. The dependency of local people's life on the wetland creates local attachment and identity for them.

REFERENCES

- Akbarzadeh, A., Laghai, H. A., Monavari, M., Nezami, S. A., Shokrzadeh, M., & Saeedi Saravi, S. S. (2008). Survey and determination of Anzali wetland trophic state through geographic information systems (GIS). *Toxicological and Environmental Chemistry*, 90, 1055–1062.
- Bank, W. (1996). *The World Bank participation sourcebook* (pp. 156–164). Washington DC: World Bank.
- Balvanera, P., Pfisterer, A. B., Buchmann, N., He, J. S., Nakashizuka, T., Raffaelli, D., & Schmid, B. (2006). Quantifying the evidence for biodiversity effects on ecosystem functioning and services. *Ecology Letters*, 9, 1146–1156.
- Castro, A. J., Vaughn, C. C., García-Llorente, M., Julian, J. P., & Atkinson, C. L. (2016). Willingness to pay for ecosystem services among stakeholder groups in a South-Central US watershed with regional conflict. *Journal of Water Resources Planning and Management*, 142, 9:05016006.
- Chan, K. M., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., & Luck, G. W. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences*, 113, 1462–1465.
- Chan, K. M., Satterfield, T., & Goldstein, J. (2012). Rethinking ecosystem services to better address and navigate cultural values. *Ecological Economics*, 74, 8–18.
- Costanza, R., de Groot, R., Sutton, P., Van der Ploeg, S., Anderson, S. J., Kubiszewski, I., & Turner, R. K. (2014). Changes in the global value of ecosystem services. *Global Environmental Change*, 26, 152–158.
- Dadras, H. (2010). Investigating the economic, social and touristic importance of the Anzali wetland. *Caspian Journal of Environmental Sciences*, 8, 89–96.

- Daily, G. C., Polansky, S., Goldstein, J., Kareiva, P. M., Mooney, H. A., Pejchar, L., & Shallenberger, R. (2009). Ecosystem services in decision making: time to deliver. *Frontiers in Ecology and the Environment*, 7, 21–28.
- Darvill, R., & Lindo, Z. (2016). The inclusion of stakeholders and cultural ecosystem services in land management trade-off decisions using an ecosystem services approach. *Landscape Ecology*, 31, 533–545.
- Fagerholm, N., Käyhkö, N., Ndumbaro, F., & Khamis, M. (2012). Community stakeholders' knowledge in landscape assessments: Mapping indicators for landscape services. *Ecological Indicators*, 18, 421–433.
- Fisher, B., Turner, R. K., & Morling, P. (2009). Defining and classifying ecosystem services for decision making. *Ecological Economics*, 68, 643–653.
- Ghahraman, A., & Atar, F. (2003). Anzali wetland in danger of death (an ecologic-floristic research). *Environmental Studies*, 28, 1–38.
- Gómez-Baggethun, E., Barton, D., Berry, P., Dunford, R., & Harrison, P. (2016). Concepts and methods in ecosystem services valuation. In M. Potschin, R. Haines-Young, R. Fish, & R. K. Turner (Eds.), *Routledge handbook of ecosystem services* (pp. 99–111). London: Routledge.
- Hage, M., Leroy, P., & Petersen, A. C. (2010). Stakeholder participation in environmental knowledge production. *Futures*, 42, 254–264.
- Hanines-Yong, R., & Potschin, M. (2013). *Common International Classification of Ecosystem Services (CICES): Consultation on Version 4, August-December 2012*. Nottingham, UK: European Environmental Agency.
- Kaltenborn, B. P., Linnell, J. D., Baggethun, E. G., Lindhjem, H., Thomassen, J., & Chan, K. M. (2017). Ecosystem services and cultural values as building blocks for 'the good life'. A case study in the community of Røst, Lofoten Islands, Norway. *Ecological Economics*, 140, 166–176.
- Kenter, J., Reed, M., Everard, M. N. I. K., Irvine, K., O'Brien, L., Molloy, C., & Collins, T. (2014). *Shared, plural and cultural values: a handbook for decision-makers*. United Kingdom National Ecosystem Services Assessment https://repository.edgehill.ac.uk/8335/1/HandBook_final.pdf.
- Kittinger, J. N., Finkbeiner, E. M., Glazier, E. W., & Crowder, L. B. (2012). Human dimensions of coral reef social-ecological systems. *Ecology and Society*, 17: 17.
- Klain, S. C., & Chan, K. M. (2012). Navigating coastal values: participatory mapping of ecosystem services for spatial planning. *Ecological Economics*, 82, 104–113.
- Lamarque, P., Tappeiner, U., Turner, C., Steinbacher, M., Bardgett, R. D., Szukics, U., & Lavorel, S. (2011). Stakeholder perceptions of grassland ecosystem services in relation to knowledge on soil fertility and biodiversity. *Regional Environmental Change*, 11, 791–804.
- Luyet, V., Schlaepfer, R., Parlange, M. B., & Buttler, A. (2012). A framework to implement stakeholder participation in environmental projects. *Journal of Environmental Management*, 111, 213–219.
- Madani, K. (2014). Water management in Iran: What is causing the looming crisis? *Journal of Environmental Studies and Sciences*, 4, 315–328.
- Martín-López, B., Iñiesta-Arandia, I., García-Llorente, M., Palomo, I., Casado-Arzuaga, I., Del Amo, D. G., & González, J. A. (2012). Uncovering ecosystem service bundles through social preferences. *PLoS one*, 7(6), e38970.

- Millennium Ecosystem Assessment (2005). *Ecosystems and human well-being: Biodiversity synthesis*. Washington, DC: World Resources Institute.
- Mirzajani, A. R., Babai, H., Abedini, A., & Dadi, G. A. (2010). Eutrophication trend of Anzali wetland based on 1992-2002 data. *Environmental Studies*, 35, 19– 21.
- Raymond, C. M., Bryan, B. A., MacDonald, D. H., Cast, A., Strathearn, S., Grandgirard, A., & Kalivas, T. (2009). Mapping community values for natural capital and ecosystem services. *Ecological Economics*, 68, 1301–1315.
- Reed, M. S. (2008). Stakeholder participation for environmental management: a literature review. *Biological Conservation*, 141, 2417–2431.
- Ruiz-Frau, A., Edwards-Jones, G., & Kaiser, M. J. (2011). Mapping stakeholder values for coastal zone management. *Marine Ecology Progress Series*, 434, 239–250.
- Saarikoski, H., Jax, K., Harrison, P. A., Primmer, E., Barton, D. N., Mononen, L., & Furman, E. (2015). Exploring operational ecosystem service definitions: The case of boreal forests. *Ecosystem Services*, 14, 144–157.
- Sarkki, S. (2017). Governance services: Co-producing human well-being with ecosystem services. *Ecosystem Services*, 27, 82–91.
- Tavakoli B., Sabetraftar K. (2002). Examination of area, population and population density factors on the pollution of five rivers in Anzali wetland basin in Iran. *Iranian Journal of Environmental Studies*. 28, 14–20.
- Tropp, H. (2007). Water governance: Trends and needs for new capacity development. *Water Policy*, 9 (S2), 19–30.
- Tyrväinen, L., Mäkinen, K., & Schipperijn, J. (2007). Tools for mapping social values of urban woodlands and other green areas. *Landscape and Urban Planning*, 79, 5–19.