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VULNERABILITY AND MARGINALISATION OF SNAIL HARVESTING RURAL GYPSY FAMILIES IN TURKEY

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ABSTRACT

Turkey has been a major exporter of terrestrial snails (*Helicidae*) for food, mainly to European Union countries and to some extent to the United States. It is mainly the marginal communities like the gypsies in Turkey who are employed in the collection of land snails. There has been a decline in the total volume of snail harvests and snail collecting communities in recent years. The article discusses the socio-economic and ecological factors, agricultural chemicals as well climate change, that enhance the vulnerability of gypsy communities and land snails. Based on qualitative data collected in in northwest Turkey that involve focus groups with snail collecting gypsy communities, interviews with middlemen, and processing facility owner and staff, the article argues that the changing climate of lived environments due to socio-economic and ecological changes make gypsy communities and their livelihoods more vulnerable. The marginal communities have made minor adjustments in their collection practices over the years, by shifting times and places of collection. Yet, contemporary regulatory changes and climate change may undermine the collective knowledge of snail collecting gypsy communities and their livelihoods in Turkey.

Keywords: Gypsy Livelihoods, Snail Collection, Marginal community, Climate Change, Turkey

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INTRODUCTION

Despite national, European and international level efforts, Roma/Gypsies¹ are one of the marginal communities that face severe poverty, discrimination and barriers to social and economic inclusion as well as exercising their fundamental rights (FRA 2014). According to United Nations Development Program regional surveys, of the estimated 10-12 million gypsies living in Europe, which make one of the largest minorities in Europe, around one million live in the Western Balkans and about half to two and a half million live in Turkey. Their marginalised living conditions have been subject to research and policy interventions in the last decade (UNDP 2017). Several European governments engaged in a Decade of Roma Inclusion (2005-2015). However, Turkey was not part of this initiative, and started a national Roma integration policy that set goals for improvement of education, health, employment and housing of Roma only in 2016 (Şahyar Akdamar 2015; Ilik 2016). However, despite these initiatives, Roma in Europe, Western Balkans and Turkey are still marginalised, and face exclusion and discrimination (RCC 2018). Moreover, their livelihoods are more vulnerable to social-economic and ecological factors.

There is flourishing literature about the livelihood changes of gypsies in Europe and Western Balkans in light of contemporary economic and political integration policies, and the connection of their livelihoods to social and economic discrimination (Marushiakova and Popov 2015; Slavkova 2008; Timmer 2013). Similar to the literature about the Roma in Europe, the literature about Roma in Turkey also highlight repercussions of stigma against the Roma communities and the historically rooted social and economic discrimination of Roma. Yet, these studies focus mainly on Roma in urban areas, particularly Istanbul, the largest city and financial capital of Turkey, as well as in Izmir and Samsun (Çubukçu 2011, Göncüoğlu 2009, Kolukırık 2006, Somersan, Schroeder and Çubukçu 2011, Yüce Tar 2015). There is a gap about the concerns and challenges of gypsies whose livelihoods depend on agrarian and rural environments, and the gender structures contributing to livelihood strategies.² This article aims to address this gap with a case study from Turkey through a political ecology framework. It examines the socio-economic and ecological changes in the livelihoods of snail collecting gypsies in

Turkey, and highlights shifting dynamics of vulnerability and livelihoods of a marginal community particularly under changing climate of lived environments

The interaction and impact of both rapid and slow onset climate disturbances exacerbate poverty in already marginal communities and make them sensitive to future disruptions (IPCC 2014). Studies also highlight the gender aspects of vulnerability, since men and women have differential access to resources and livelihoods, and adopt strategies in the pursuit of viable livelihoods in response to changing opportunities and constraints in specific places (Killsby and Rosenbaum 2012). Political ecology emphasizes connectivity between socio-ecological relations across different scales, and allows a broader context to understand ecological changes and the political economy of communities whose livelihoods depend on access to natural resources (Robbins 2012). While providing a critique to the narrow conceptual framework of climate adaptation, political ecology literature also helps to unveil how local power asymmetries contribute to differential vulnerabilities for otherwise homogeneously handled rural populations and moving populations (Peet, Robbins and Watts 2011). Political ecology, coupled with feminist insights, can help assess the role of gendered knowledge in the livelihoods of marginal communities, gendered responsibilities in relation to resource use as well as gendered differentiated impacts of climate change (Radel 2012). It also helps alter the climate change rhetoric that negates women's agency by constructing them as vulnerable victims (Carr and Thompson 2014).

Birkenholtz (2014) proposes a network political ecology methodology to raise new questions about climate adaptation and vulnerability in rural contexts and "evaluate particular social-ecological processes and place them within their broader recursive relationships" (p.310) Network political ecology, applied to rural environments, can help to examine how different actors (humans and non-humans) face divergent processes of risk and vulnerability depending on the character and dependence of their resource-use systems. (Birkenholtz 2014). An emphasis on connections in livelihood studies, as emphasized by Scoones (2009), can also help to look at processes of change across scales. Moreover, in studying mobile rural populations, where the boundaries of the groups (e.g., household, community) and their

movements do not fit neatly with the meso-scale impacts of climate change and local scale particularities of ecological constraints, an attention to connections in social-ecological systems can help to identify how social structures that mediate vulnerability are affected by these changes in return (Bock 2006).

This article examines the shifting context of marginality and vulnerability of gypsy livelihoods and women's roles in the making of livelihood from snail collection in Turkey. The article aims to address three questions: What are the socio-economic and ecological factors that affect snail collecting gypsy communities in Turkey? How does the snail collecting community respond to the interaction of changing social, economic and ecological conditions that affect their livelihood? What are the impacts of these livelihood changes on gender structures? While highlighting the embodied knowledge among gypsy communities that sustain human-nature relationship in marginal environments, the article argues that connections among climate change effects and ecological issues (e.g., chemical pollution) that gypsies face erode their collective learning about snail collection and thus, endanger their livelihoods.

The collective practices of snail collecting gypsy communities in Bolu demonstrate that the community has made minor adjustments by changing the times and places they collect snails over the years. Taking into account the complex interaction between ecological factors and climate change, the community has also been keenly aware of reductions in snail size and volume and their increasing vulnerability. Yet, hesitancy of snail processing facilities and middlemen to incorporate snail collecting gypsy communities and particularly women in their conversations and decisions about adjustments in snail collection practices undermine the collective knowledge, climate change adaptation capacity and the livelihood security of gypsy communities.

The article first discusses gendered livelihoods and the vulnerability to climate change. It then explains the case country context, by discussing marginality of gypsy livelihoods in Turkey, climate change impacts in Turkey, and the ecology and economy of land snails. After introducing research methods, the article provides the findings of the case study: Through following a network political ecology approach (Birkenholtz 2014), the article's findings highlight the contribution of women to the

livelihoods among snail collecting gypsy communities, how the changing climate create shifts in the collection times of snails, and the regulation introduced by the state and the incoherent decisions of processing facilities and middlemen about regulating snail size brought to facilities complicate the decision making of snail collecting communities.

Gendered Livelihoods and Climate Change

Gender is “a critical variable in shaping processes of ecological change, viable livelihoods and the prospects for sustainable development” (Elmhirst and Resurreccion 2008: p. 5). Political ecology studies on gender and livelihoods aim to examine how resource rights are negotiated and controlled between men and women within households and in communities (Leach 2007). Studies have examined gendered patterns in cropping patterns, technology uptake, migration, gender gaps in productivity and access to extension services as well as gender based interventions in natural resource management (Elmhirst and Resurreccion 2008). This broadened focus helped to move beyond land bias and relative discrimination of women in land tenure systems in rural livelihoods and incorporate differentiated effects of development and decision making on gender and gender’s impacts on livelihoods. Thus, they have made women’s contributions to livelihoods visible and relevant.

Often, women’s activities are strongly interlinked with the services provided by local ecological systems. Due to their traditional roles in gathering firewood, collecting water, managing agriculture in rural areas, women are greatly affected by natural resource depletion and they may have more incentives to conserve resources. While this relationship has led to interpretations that women’s reliance on natural resources increases women’s ability to acquire and disseminate knowledge and information about ecosystems, and women are more likely to engage in sustained practices and conservation techniques, scholars also caution against essentialising women’s relationship with the environment (Doss et al. 2017; Leach 2007). Rather, the multiple realities of women’s everyday lives, such as limitations in access to other resources and a desire to keep their work burden from increasing, may motivate them in their decisions that lead to conservation (Agarwal 1997).

Moreover, women cannot be viewed as a homogenous category or their identity cannot be assumed as a fixed entity. The interplay of social and power relationships mean that identities are emergent, and intersectionality addresses the relationships between the multiple dimensions of social identities and subject formation, which are multiple and non-linear (Carr and Thompson 2014; Nightingale 2011) Variabilities to access to resources are also determined by and depend on wealth, class, age, and other social and economic categories, including women's relationship to men. Smith (2015) discusses the case of Masaai women's access to livestock, and how upon marriage, a woman will be allocated her own milking cows, be responsible for milking them and have full authority over decisions about milk offtake and allocation.

Women's role in natural resource management and access are also linked to broader socio-economic changes at multiple scales and can have implications at broader scales. Migration of men, as a livelihood diversification, can lead to feminization of rural livelihoods, which have direct impacts of natural use patterns. (Eroğlu 2017) Examining the impact of large scale water development projects, and the related introduction of irrigation technologies and cash-cropping in southeastern Turkey, Harris (2008) argues that the perceived and expected benefits of irrigation had uneven impacts on rural livelihoods. Harris (2008)'s findings demonstrate that first, one third of poor women in the research area noted positive benefits of irrigation related-changes unlike three-fourths of the overall population. Second, those who were previously engaged in animal husbandry, many of whom were among the poorest rural residents and did not have land of their own, noted significant losses in terms of access to grazing lands when cotton economy emerged in the area. Third, work burdens have been increasing particularly for women and children, which also require attention "to diverse and interlinked processes of socio-economic differentiation (e.g. poverty, landlessness, livelihoods, ethnicity) as co-constitutive, rather than as analytically separable" (Harris 2008: p. 2644).

Attention to this variability and marginalization of certain segments of the population as a result of broader socio-economic changes is also critical for long term sustainable management of natural resources and the resilience of the communities

against emergent and new challenges, such as climate change. Women and other socially marginalised groups are likely to be most vulnerable to climate change because of lack of access to resources and the socially and politically driven lack of participation in decision making (Tompkins and Adger 2004). Women and men do not experience climate change the same way. In particularly developing countries, economic restrictions and cultural norms preclude women from taking part in income-generating jobs, and women also become more vulnerable to extreme events (Killsby and Rosenbaum 2012). Climate change related effects can also exacerbate existing gendered vulnerabilities due to men's and women's different livelihood roles. A study about rural livelihoods and climate change vulnerability in Vietnam found that women's workload tended to increase with the need to transplant rice as a result of late rainfall. The same study also highlighted additional challenges for raising livestock due to the reduced availability of natural resources and fresh water (GTZ 2010). However, as the literature on intersectionality and gender highlights, social differences including gender, class, household headship, age and stage of life shape women's differentiated experiences and vulnerability to climate change. Huynh and Resurreccion (2014)'s study examining vulnerability to agricultural water scarcity in Central Vietnam highlighted how differences in women's access to water, to forestland and credit mark their adaptation differentiation. Their findings also caution that existing development policies can cause inequality in resource access in practice and can create a risk of further marginalizing certain groups of women, especially female heads of household.

When we talk about climate change, scholars also caution against emphasizing the vulnerability of women, which ignores their agency and their adaptation and management skills. Skinner (2011) argues that "women's experience in managing natural resources, their involvement in climate-sensitive activities such as agriculture, fishing and forestry and the strong social networks in which they may engage mean that they often hold knowledge, skills and experience that are fundamental for successful adaptation programmes" (p.61). Studies demonstrate how women can manage the consequences of climate change by engaging in different ecological decisions. For instance, in Malawi, women smallholders in

several communities have adopted ecological cropping techniques to overcome acute food shortages. While these decisions have, in return, enabled them to take advantage of changing rainfall periods to produce a second maize crop, they also challenged gender roles as women now took on income-generating roles previously reserved for men (Rodenberg 2009). However, livelihood strategies and gendered challenges of particularly minority communities have not been covered by regional or international reports on rural development (Esplen 2007). This article focuses on gypsy communities, a marginal community in Turkey.

Case Study Context: Turkey

Marginal Gypsy Livelihoods in Turkey

Gypsy communities have been marginal--subordinated to or excluded by others, in the communities they have lived. Whereas some scholars connect this marginality to their transnational, non-territorial based identity to explain their relationship to the states and societies they live in, a vicious cycle of their social and economic exclusion perpetuates further marginality (Barany 2002). Among the poor communities, economic discrimination leads to social and cultural exclusion, which leads to a vicious cycle of marginality in society, unemployment and low socio-economic status. Problems with access to education, low educational attainment among gypsy parents, difficulties in providing supplies for school, stigmatization of gypsy children at school are also some other factors that perpetuate the cycle of marginality for Turkish gypsies (Eroğlu et al. 2014).

Like other disadvantaged communities, the data about the population numbers of gypsy communities in Turkey is not reliable, which explains the large window of gypsy population numbers in Turkey from half a million to two and a half million (Eroğlu et al. 2014). Because there are no extensive socio-economic surveys, country reports, including the most recent country strategy report prepared by Ilik in 2016, provide estimates about Romani unemployment, access to health and education. Studies about the gypsies in Turkish economy explain the different names gypsies are referred to as their occupation sub-group, such as *Arabacı* (horse carter), *Demirci* (ironworker), *Kalaycı* (tinsmith), *Elekçi* (sievmaker), *Sepetçi* (basket weaver), and

the different niche occupations they occupy as flower sellers in Istanbul. Many of these professions are passed from parents to children creating a cyclical pattern of informal economy and poverty (Özateşler 2014). These employment patterns are also regional. For instance, among the gypsies in Izmir, common professions are porter, carpenter, driver and musician (Eroğlu et al. 2014). Scholars also discuss migration patterns among gypsy communities to urban areas due to lack of livelihood opportunities in rural areas, and shifts in their semi-nomadic lifestyles. Whereas the changes in the agricultural structure after the Marshall Plan to Turkey in 1950s and increased mechanization affected the livelihoods of ironworker gypsies in rural Edirne in western Turkey, the Doms in southeastern Turkey were forced to migrate and relocate to Diyarbakir after political turmoil in 1990s (Önen 2012). Those who continue their nomadic lives, keep a residence in the winter, but keep travelling from spring till fall (Eroğlu et al. 2014).

Among the gypsy communities, women often face additional burdens in providing livelihoods. Whereas some women in urban areas resort to panhandling, many others work in the informal economy as housecleaners, babysitters or patient caregivers in urban areas and as seasonal agricultural labour in rural areas (Eroğlu et al. 2014). In situations where division of labour exist among the gypsies, for instance, where gypsy men procure the flowers from wholesalers at auctions and the gypsy women sell it individually on the street, women still have to give the money to their husbands and take care of the children. (Özateşler 2014). According to a recent country profile report by the European Roma Rights Center (2012), “Romani women are in a particularly vulnerable position”, since they face “multiple discrimination as members of the Romani community and as women” (p.8). The same report continues to elaborate the discrimination gypsy women face as:

It is estimated that the vast majority of Romani women are illiterate or semi-illiterate and do not have access to stable jobs with social security. Further, according to reports, early marriages are still common practice in Romani communities. Gender-based violence often goes unreported and the communities or even law enforcement officers do not follow up acts of domestic violence towards Romani women (p.8)

In her case study of flower sellers in Istanbul, Özateşler (2014) also demonstrate how certain features of patriarchy, such as domination by men, gendered divisions of labour, and childcare, create gendered inequalities among urban gypsy women in Turkey. The reliance of livelihoods to the informal sector make them unpredictable in the long term and susceptible to political, socio-economic and ecological changes.

The Changing Climate of Lived Environments in Turkey

Global climate change models project increased aridity in the Mediterranean region and extreme droughts. Reviews of past and current climate patterns show that Turkey is affected by climate change. Climate change is manifested by the shrinkage of semi-humid and humid coastal areas and at the same time the considerable spreading of semi-arid and arid areas. Not only the data of existing patterns, but also future predictions indicate that drought is an important risk factor in general in Turkey (Türkeş et al. 2016).

Based on temperature and climate data from 1951 to 2004, Dalfes and colleagues (2007) argue that summer temperatures have increased in Turkey, with an overall increase in maximum summer temperatures in the western and southwestern Turkey, and significant decreases occurred in winter minimum temperatures in along the northern and southern coastal regions. Their study also demonstrate an overall decrease in precipitation patterns in particularly western and northwestern Turkey. Studies from different time period also corroborate Dalfes et al. (2007)'s work: Examining monthly precipitation data from 96 precipitation stations, each spanning from 1929 to 1993, Partal and Kahya (2006) confirm a decreasing trend for monthly precipitation totals. According to their findings, greatest predominance of negative trends occur in late winter and September, and in western and southern Turkey. Partal and Kahya (2006)'s findings are also consistent with hydrological flow studies that demonstrate reduced stream flows particularly in western Turkey. Using data from 52 meteorological research stations from 1950 till 2004, and checking for urban heat effect, Tayanç and colleagues (2009) argue that urban areas experience more precipitation variability, and there has been significant warming in southern and southeastern parts of Turkey.

Future predictions about climate change in Turkey also demonstrate significant changes. Using global climate change models, and A2 scenario, Türkeş (2012) warn about extreme weather events and the expansion of desertification into arid and semi-arid areas of Turkey in the south and southeast.³ Demircan and colleagues (2017) predict an increase of 1.5 to 2.5 degree Celsius temperature increase (based on Representative Concentration Pathway 4.5 scenario), and a 2.5 to 3.5 degree Celsius temperature increase (based on Representative Concentration Pathway 8.5 scenario) for the 2016-2099 period. The same study also argues that there will be an overall irregularity in precipitation patterns in Turkey. These findings support eastern Mediterranean regional models which also predict a significant reduction in precipitation in Turkey (Gao and Giorgi 2008).

These patterns affect rural livelihoods in Turkey: For instance, climate change effects causing drought and flood in Bolu, Turkey, have increased the work load of women in rice cultivating households, and the establishment of two hydropower projects limited community's access to irrigation. These changes had impact on land management, which had increased the vulnerability of women to climate change (Eroğlu et al. 2018). Another study in Turkey's southeast also found increased vulnerability for women: Shifting irrigation patterns have shifted the crop pattern from rice to wheat, and the migration of men from rural areas have increased the work load of women (Eroğlu 2017). Climate related changes are likely to impact particularly marginal communities whose livelihoods are sensitive to ecological changes, such as the snail collecting gypsy communities.

Ecology and Economy of Snails in Turkey

According to the United Nations Food and Agriculture Organization, land snail is one of the edible insects that will address future food and feed security (FAO 2013). Although not generally part of the Turkish cuisine due to the status of snails as not *halal* (permitted) in Islam, land snail is an important source of protein and delicacy for many cuisines of the world. Its harvest and farming is practiced and encouraged for income generation and conservation of forests in Sub Saharan Africa (Agbogidi 2010). In recent years, snail slime has also become a popular human cosmetic ingredient due to its collagen, hyaluronic acid and glycolic acid effects (Conte 2015).

Turkey has been exporting land snails as a source of revenue since the 1960s. Total volume of export has increased from 970 tons in 1961 to about 4,000 tons in 1990s (Ateş 1963; Yıldırım 2014). Turkey exports about 1,600 tons of terrestrial snails (*Helix lacorum*) annually, majority of which comes from harvesting of wild snails⁴. Snail exports, mainly to European Union countries (France, Germany, Italy, United Kingdom) and to some extent to the United States, Japan and China, is an important export revenue for the Turkish state (Baki 2010). Land snails are sometimes categorized as pest because their mucus trails reduce the marketing value of crops and fruit and they eat the plants such as beans and melons (Özkan 2014). Turkish Ministry of Agriculture reports state that there exist 19 frog leg and land snail processing facilities in Turkey. However, only five are dedicated to processing specifically land snails (Talimat 2011).

In recent years, snail harvests and thus exports have declined due to several reasons, including uncontrolled harvests from the wild, increased use of agricultural chemicals and climate change. The staff working at Balıkesir facility also confirmed such reductions, naming 2007 and 2015 as “the worst years” for snail collection. Indeed, the processing facilities acknowledged that they imported live snails, first from Bulgaria and Greece (about 500 tons), and then from Romania (about 800 tons), in 2014 and 2015 respectively, before processing and exporting them.

Although they have a wider geographical distribution in Turkey, land snails are concentrated in the Mediterranean, Black Sea and Marmara regions of Turkey because of humidity. These regions also contribute the most to the snail harvests for export markets (Baki 2010). Seven terrestrial snail species found in Turkey (*H. asemnis*, *H. lucorum*, *H. cincta*, *Cyrtomphalus asperses*, *Cantareus apertus*, *Theba pisana*, *Eobania vermiculata*) are edible and have an economic value. Snails hibernate from October till April in the Turkey. Snails also seal themselves and become dormant for shorter periods during drought in the summer. Also, when the temperatures fall below 12 or 15 degrees Celsius, they eat less and they also get dormant. (Yıldırım et al. 2004)

Due to their dispersal ability and ecological specialization, land snails are susceptible to climate change, and climatic warming may cause local extinctions of certain snail

populations (Goodfriend and Mitterer 1988). Current studies about different snail populations demonstrate negative correlation among climatic variability, mortality, abundance in a given habitat, and reproduction patterns (Johnson 2011; Pearce 2015). While some land snails may modify heat exchange across the interface between their internal and external environment through color polymorphism (e.g., pigmentation of the shell), unfortunately, many land snails also have a limited ability to adapt to climate change related to heat stress due to their low mobility (Schithuizen and Kellermann 2013).

RESEARCH METHODS

Because place-based studies of multiple stressors illustrate how contextual factors produce differential outcomes, the paper examines the shifting vulnerability of humans and nature through a case study approach. The primary data was collected by the first author in May 2015 and July 2016, through focus groups with snail collecting seasonally migrant gypsy families in Bolu. A total of 15 men and women of three households living as a multigenerational family participated in these focus groups. The first author also carried out semi-structured interviews with three male middlemen⁵ working with snail processing facilities (of Bolu and Marmara/Central Anatolia region, two of which are gypsy), the snail processing facility owner in Zonguldak, and three staff of the snail processing facility in Bursa (a male aquacultural resources engineer, a female foreman coordinating the work of all women workers at the facility, and a male chief technical staff in charge of storage and marketing). While the interviews with the facility owner and staff were face-to-face, interviews with the middlemen were carried on the phone since they work off the books and did not trust a face-to-face interview.

Following Carolan (2008)'s insights on embodied knowledge, the first author was engaged in participant observation following everyday practices of snail collecting gypsy communities and their experiences of social-ecological changes in Turkey's northwest countryside following the focus groups. Depending on the precipitation, the gypsy families visit the area to collect snails and the first author monitored the set up of the tents on the Mudurnu - Bolu road by the migrant gypsy families. After

multiple visits to the tents, and canceling one meeting due to unexpected snowfall in March, the focus groups were carried out in May. There is an area created for sitting and sleeping, and another area is organised as kitchen. The focus groups were conducted in the tents of the gypsies, with varying age groups. Two participants stated they were over 60 years old and a married young woman stated her age as 17. Although there was mention of social exclusion at the beginning of conversations, and a defensive position of their political and cultural identity as a reflex to social exclusion, the conversations focused on livelihoods and snail collection. During the focus groups, three school-aged children were around. However, they did not participate in the focus groups. After the focus groups, the first author asked them about their everyday activities during the snail collection times. The children stated that they do not go to school due to social exclusion and stigma at school, and perceived lack of benefits from education. They stated they help their families often during snail collection. The authors also used secondary data, and reviewed videos, official documents, news articles about snail collecting and gypsy communities in Turkey. Review of secondary data and literature allowed a triangulation of data. One of the challenges in the research was the difficulty of reaching to snail collecting communities and middlemen, which may be due to the informal economy of snail harvest (e.g., export values are reported in official statistics but the money paid to snail harvester communities and middlemen are not reported) and continuation of snail harvests from the wild even during the state ban for harvest.

FINDINGS

Gendered Livelihoods of Marginal Communities

The task of collecting land snails from the wild has been pushed to the marginal communities over the years. In western Turkey, there are rural communities that are fully resident in villages or neighborhoods and use land snail or frog harvests as primary or secondary income (Önen 2012). Today, collecting land snails from the wild provides livelihoods mainly to marginal and poor households who often face food insecurity, majority of which are seasonally migrant labour communities, and

the gypsy. Both facilities and the middlemen confirmed they work with gypsy communities who collect the snails but their exact numbers are not known.

Harvesting land snails provides two-thirds of the income for gypsy communities in northwest Turkey, providing livelihood and food security. The rest of their income to be compensated by men working seasonally collecting scrap or in the construction sector as temporary wage labour. Snail collection is in an informal sector activity and families also reported they do not have social security support. There is often a preference for age mixing among siblings and other family members among gypsy-traveller families (Powell 2011). The gypsy community in Bolu travels as a multigenerational household and engage in snail collecting collectively. One woman stated that “[we] are happy to be in nature. [Our] only concern is not to lose this livelihood.” While these remarks resonate with Özateşler (2014)’s argument that gypsies tend to choose informal sector professions that minimize interactions with the state, they also highlight the marginality of the gypsy community and how gypsies are also pushed to these professions due to insufficient qualifications for better paying jobs, the mistreatments and exclusionary practices they face (Önen 2012).

The snail collecting community in Bolu has a winter residence in a village in prefabricated housing built after the 1999 earthquake, but they travel to towns and villages where they can collect snails based on their connection with the middlemen. During collection times, they live in tents that they set up in the periphery of villages or residential areas. The individuals in the focus groups were vague about their ages, and it was not clear whether they used their voting rights. Although many of the gypsy communities face a shift in gender dynamics due to migration to urban areas and sedentarization, the snail collecting community in Bolu was mainly matriarchal. During the focus groups, the women, who married at an early age, and had multiple children, mentioned they participated in both private and public domain decisions for their families. However, both men and women also acknowledged that when they interact with a male-dominated society in public space, they “role play” in a way that suits this structure.

The households knew the various snail collection sites through years of practice, and learning the places from their own mothers. While it is the women who lead the group to snail collection sites and decide the times of collection depending on weather, the community emphasizes learning through participation and socialization from the family and the community, which are seen as fundamental to the continuation of group's social and cultural identity (Jordan 2001). These practices are also critical to pass down collective learning and traditional family livelihoods from one generation to the next, which are also common among gypsy to learn trade skills (Özateşler 2014).

The whole family works together during the snail collection because every hand collecting helps to increase the total amount collected. The processing facility in Balıkesir stated that they paid 2 Turkish lira per kilogram of snails collected (0.76 USD/kg) in 2015. In 2016, they increased their price range to 2,7 - 3 Turkish lira/kg (0.93 to 1.03 USD/kg). However, there was always the middleman fees, who also cut a commission for himself (about 35 kuruş/kg or 12 cents/kg). "When the price is very low, the snail collecting communities are pushed to other jobs" said a middleman. The payments are given at the end of the season, and the processing facility "does not intervene in how the payments are made." Therefore, the snail collecting gypsy communities face an unpredictability of their income every year, and depending on the middlemen they work with, they also face the challenge for providing an upfront cash income at the beginning of the snail collecting season.

Changing Climate of Gypsy Livelihoods: Snail Size and Volume

The primary quality criterion in snail gathering is the size of the snail. If the snails are below or above the desired size, some middlemen penalize the gatherers and do not purchase the product, while others indicate that they take the product. Factories state that the snails are brought to the factory without reaching the adult size, which negatively affects offspring development in the next season. The women in the interviewed gypsy families have also indicated that paying attention to the snail size affects the amount of money they can earn the next year. One woman mentioned that they are "bringing less snails every year," and a few women stated that they try to be sensitive about this issue: A woman said "When the snail is small, I tell everyone not

to touch because it is the young” but she also expressed concern that other groups collect young snails. One woman in her 40s commented that “we have no choice but work in another person’s farm as a labourer when the snail numbers reduce.” However, a man mentioned that “the rapid decline in the number of snails have caused the families to ignore” breeding patterns and one woman complained that others “just collect whatever they can find.”

During the focus groups, women provided more information about the places they go, how to sort and collect quality snails, breeding times and the behaviors of snails as well as changes in collection amounts over the years. Because their livelihoods depend on weather conditions, snail harvester communities can relate to short-term weather changes within a season. Snail harvesting communities have been involved with collecting snails from the wild since their childhood. They learned it from their own families, who were also engaged in snail harvesting, which used to provide a livelihood at least six months in a given year. A woman commented that snail collecting season is now “reduced to 4 months” and the irregularity of precipitation and/or extension of dry seasons affect their collection patterns. Another woman mentioned the unpredictability of weather patterns and gave the example of snow in May 2014 and said “snails [become dormant] immediately when it gets cold. They don’t like cold at all. When it gets cold, then we have no income. We have to look for other jobs.” The unpredictability of the weather patterns, thus, has an impact on the snail behavior, and this knowledge does not overlap with the landscape, weather and other ecological knowledge gypsy communities have learned from women leading snail collection trips over the years.

Snail collecting community also face other challenges and they have to change where and when they collect snails. A male said “We used to go to every district in Bolu. We used to collect the most of our snails in Seben, but in recent years, what we see is only empty shells in orchards.” Although snails are not susceptible to insecticides and miticides, some compounds, including methaldehyde, are toxic to snails. The processing facility in Balıkesir and Zonguldak also expressed concerns about overuse of agricultural chemicals. Thus, they started testing snails in their facilities according to the guidelines of Ministry of Food, Agriculture and Livestock, but they detected

no chemical residues highlighted in the guidelines. When the gypsy communities cannot collect snails in the places they are familiar with, snail collecting gypsy communities have to venture into new locations. However, the social stigma and exclusionary practices may prevent them learning about these new landscapes. One of the men in his 50s said “there are some orchard owners that swear to us,” but he also said they do not face any major problems. “We know how to avoid [trouble orchards]. Otherwise, nobody around Bolu causes us trouble when we collect snails in their fields” said another woman. The familiarity with Bolu, both its people and landscapes, provide an advantage for the snail collecting gypsy communities that they have sustained their snail collection practices with minor adjustments where and when they collect snails over the years.

The processing facilities and middlemen have also expressed concerns about the shortening of collection period. “The majority of the collection and processing is handled between March 15 and May 15” in recent years, stated a processing facility staff. The shortening of snail collection season has reduced the income for snail collecting communities. Women mentioned that until about a decade ago, they also used to collect in the fall. One woman noted “The fall used to be an important collecting season but sudden temperature changes have presented only limited days for collection.” This is also another challenge for gypsy families’ livelihoods and they have to look for other seasonal jobs. Often, men leave for construction work when the community cannot collect enough volume of snails. These climate related limitations make women vulnerable because women have to stay alone to provide livelihoods, take care of the children, and feed their families. A few women also noted that when men are not around, they also do not go to collect snails, and lose their local knowledge.

Regulation and Monitoring of Snail Collection Behavior

Geographically, each of the five land snail processing facilities has their own collection areas, and as the Zonguldak processing facility owner stated “We don’t buy snails from the middlemen of another [processing facility]’s realm.” However, because of reduction in collection volumes, the processing facilities are getting consolidated: Only the snail processing facilities in Zonguldak and Bursa,

interviewed in this research, now prepare processed food for exports while the others send their collected snails to these facilities.

There is a growing concern among the snail collecting community, the processing facilities and the middlemen about the reducing volume of collected snails. Some ecological factors that cause reduction in land snail population are extensive agriculture and use of agricultural chemicals, industrial poultry facilities flourishing after the 2007 bird flu outbreak and overharvesting during breeding times. One of the women expressed a concern about the size of snails, while the smaller snails are refused by the processing facility, the bigger ones can also be refused by the facility. “Maybe it is because of the increasing number of poultry farms around here,” said the woman, “that some snails are getting bigger than usual.” However, although the smaller size has been expressed as a concern for rejection by the processing facility, the processing facilities have not confirmed concerns about bigger size.

An ecological and social factor affecting the snail population has been overcollection during breeding times. Since 2008, the Ministry of Food, Agriculture and Livestock, Department of Conservation and Control, has enforced a ban on “hunting” of commercial aquaculture, and established a time limit of collecting land snails banning collection for two months, from June 1st until July 31st to protect them during breeding periods (Baki 2010, Resmi Gazete 2009). The focus group participants were aware of these regulations as they learned it from the middleman they work with.

One way for the processing facilities to monitor and enforce snail size and the ban is to issue warnings through the middlemen and stop purchases. Zonguldak and Balıkesir facilities confirmed increasing collection of the young snails, which affects sustainability of their trade in the long run. Facilities use different strategies to address this: Whereas Zonguldak facility accepts the collected snails to avoid losing its contact with the collecting families, Balıkesir facility uses a stricter approach and stops purchasing till next year. In 2016, the processing facility in Balıkesir stopped its purchases from Denizli, Söke, Milas, Adana and Kütahya and closed the storage facilities collecting from these sites. The gypsy communities stated that they do not have direct contact with the snail processing facility. The middlemen in Bolu, who

is also a gypsy, relates to concerns of snail quality and size. He said that over the years the communities in Düzce has given him “smaller and smaller snails.” When there is such a concern, he said “the middleman first warns the snail collecting community.” If the snails continue to be smaller size, then he said he refuses to purchase the snails from the same group. While the ban period is effectively communicated to the gypsy communities collecting snails, the inconsistent messages about snail size make both the snails and the gypsy communities vulnerable. While the snail collecting communities had to make adjustments to the timing they have learned from previous generations to provide snails of required size, as one woman stated, they also had difficulty learning the new places and patterns of snails.

DISCUSSION

The main question of this research is whether the change in environmental factors created by climate change has resulted in any gender-based effects and effects on the subsistence of nomadic families living in rural areas. The findings show that the gypsies living in rural areas that are among marginalised societies are affected by the environmental changes created by climate change. The first of these effects are seen as the unpredictability of income from traditional livelihoods and loss of income. Especially the gypsies living in rural areas working in jobs related to nature experience this effect through unexpected temperature changes and drought.

As Eroğlu (2017) and Eroğlu et al (2018) discussed in relation to shifts in rural livelihoods in rice farming communities in northwest and southeast Turkey, climate change effects are gendered. The vulnerability and the workload of gypsy women increases as women have to adapt to changes in the landscape, timing and the behavior of snails, which provide their livelihoods. The forms of collective learning based on the indigenous knowledge carried by women are changing, and this affects the structure of the matriarchal communities snail collecting gypsy communities live in. As women are no longer able to use the nature-based local knowledge and can make adjustments, men start to seek jobs in the dominant patriarchal economies. This changing position of men in the family economy has also begun to affect the gender roles in the family structure. The snail collecting families can no longer sustain two-

thirds of their income from snail collection and men migrate to urban areas to seek temporary jobs.

Climate change creates new vulnerabilities and exacerbates longstanding challenges for marginal communities. However, these communities are not just victims, and can become important actors in developing sustainable development frameworks. Particularly in agrarian environments, resilience strategies of moving populations, seasonal agricultural labour and semi-nomadic groups like gypsy communities, are not static and change depending on the socio-economic and ecological contexts. The focus group findings suggest that the snail collecting communities have made successful adjustments by changing the places and times they collect snails. Yet, the extent and the short onset of changes have prevented them integrate this new knowledge into their collective learning. Thus, despite being aware of shrinking snail size, some of the participants acknowledged they continue to collect snails.

The rural areas section of the IPCC's most recent report states that "the impacts of climate change on livelihoods and incomes in rural areas will be complex" and "depend on many intervening factors" (Dasgupta et al. 2014: 630) Whereas some impacts may affect the infrastructure of agriculture, other impacts will affect the ecosystems that rural people depend, and how vulnerable people living in marginal conditions mediate these ecological and socio-economic effects. The case of snail collecting gypsy families demonstrate these challenges of adapting to climate change in rural areas particularly by marginal communities.

Women are important in sustaining the local knowledge about snail collection practices, and can become important actors in developing sustainable livelihoods approaches. Several women participants stated that they are cognizant of climate change patterns, and adapt their collection practices. They also mentioned about their collective learning about breeding periods, and how they observe these are changing. Establishing close links between agricultural extension officers, middleman and gypsy communities is also important for food and livelihood security. For instance, despite low rates of collection in 2016, the Marmara/Central Anatolia collection amounts have not reduced significantly. The middleman said that by following meteorological reports, particularly precipitation, he coordinated collection sites and

days with collecting communities. Thus, he was able to collect 270 tons, and became the only region selling to Balıkesir processing facility that did not face a sharp reduction in collection volume. In short, gypsy women should be included in the conversations among the middlemen, snail processing facilities and the state when developing strategies for sustaining snail collection and sustaining the rural livelihoods of a marginal community.

NOTES

¹The term “Roma” includes ethnically, culturally and geographically diverse groups that self-identify as Roma, Gypsies, Travellers, as well as other terms. It is not used to ignore the vast diversity within the many different groups and related communities, nor it is intended to promote stereotypes. The word gypsy can also have negative connotations, but it is an umbrella term to define three different groups in Turkey (Dom, Rom and Lom). Some groups, with whom the first author also worked with, want to be associated with the term gypsy to resist discrimination and human right violations. Thus, the term gypsy will be used in the remaining of the article.

²In Phase I of Turkey’s Strategy Paper on Roma People 2016-2021 Action Plan, 12 cities (Adana, Ankara, Balıkesir, Edirne, Eskişehir, Hatay, İstanbul, İzmir, Kırklareli, Manisa, Mersin, Tekirdağ) will benefit from education, health, housing and employment initiatives (Ilik 2016). Bolu, where the research for this article is done, is not one of these pilot areas.

³A2 scenario assumes a world population of 15 billion by 2100, and a diverse population with some adaptation capacity. More information can be found in the website of Intergovernmental Panel on Climate Change.

⁴Like many statistics in Turkey, there exist different records of total harvest and exports of land snails. By using Ministry of Agriculture reports, Baki (2010) reports 2008 land snail exports as 1,397 tons. However, other reports suggest the total exports as high as 2,000 tons/ per year There can also be a discrepancy between total harvests from the wild in Turkey and total exports from Turkey (Yıldırım 2014).

⁵ The middleman of Mustafakemal Pasa is also connected to his local Romani association (he is the president) and his wife also works with him as a middleman. Yet, the snail harvester communities is not organised. The only exception is the gypsy community in the neighborhood of Menzilahir, Edirne, whose livelihoods depend on harvesting frogs and snails from the wild. The community in Menzilahir has established an association, Edirne Kurbaga ve Salyangoz Toplayıcıları Yardımlaşma ve Kalkınma Derneği (Edirne Frog and Snail Harvesters Solidarity and Development Association). This Association in Edirne has 56 members and their families make a living harvesting frogs from the wild for 10 months of the year and snails only one month of the year (Erdogan Aras 2009, Radikal 2010).

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