

Conflicts in urban peripheries in Europe

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ABSTRACT

Urbanization is a global trend which is taking place at the costs of agricultural, forest, and other natural or semi-natural areas. As a result of urbanization, transitioning zones in urban peripheries located between urban and rural areas have a mixed character from a spatial, ecological, socio-demographic, and economic point of view. Different land use mixes and interests exist there in parallel and cause tensions and conflicts. In our research, we aimed at investigating the specific characteristics of conflicts in urban peripheries across Europe, showing striking examples and discussing possible recommendations for policy and planning addressing those conflicts. A structured literature review of 94 papers was conducted. The findings reflected a huge diversity in locations, contexts, and methods. Conflicts in urban peripheries in Europe is an interdisciplinary topic that is handled by social as well as natural sciences. We have identified four main conflict categories in urban peripheries: (a) land-use conflicts that relate to diverging interest in land use, (b) socio-economic conflicts that related to social aspects emerging between governance actors and different economic interests, (c) ethnic conflicts that related to race, religion, and custom, and (d) human-wildlife conflicts. The majority of papers were found in the category of land-use conflicts in urban peripheries. The main conflict topics in urban peripheries were related to socio-economic imbalances, house construction, and ethnic differences. Several types of governance actors and conflict topics could be assigned to each conflict category showing the variety in this context. A general recommendation to mitigate conflicts in urban peripheries could be a combination of various top-down and bottom-up policy and planning approaches, consulted and implemented by the governance actors who have been sensitized for the different viewpoints.

1. Introduction

In Europe, 75% of the population lives in urban areas (UN, 2023). There are many reasons why people move to the city, e.g., for better job opportunities, better health care, greater cultural life, or better public transport. The change in urban population is an indicator of land use change but there is an equally important indicator, which is the "sprawl per capita". Cities become less compact. Paradoxically, even in areas with decreasing population, urban areas continue to grow (Ravetz et al., 2013). Between 1950 s and 1990, European urban areas have expanded by an average of 78% while their populations have grown by only 33% (European Environment Agency, 2006; Ravetz et al., 2013). Today, this trend is less emphasized but still, urban sprawl occurs rather in form of low-density urban development with an increasing number of households but decreasing household size (Hennig et al., 2015; Oueslati et al., 2015). Most often, urban expansions are happening beyond city fringes

and they contribute to the emergence of transitional urban peripheries. As shown by Geneletti et al. (2017) various names can be used to describe such peripheries – the most common terms are "suburb", "peri-urban", "fringe", "edge", or "interface". Nevertheless, despite various terminology used to name urban peripheries, such areas share specific similarities. Some urban peripheries, particularly peri-urban areas, are heterogenic in their spatial character. In such cases, urban characteristics are mixed with rural features and a clear distinction between what is "urban" and "rural" is no longer visible, making urban-rural dichotomy fuzzy for such peripheral areas. Such areas are characterized by gradients of mixed land uses, aligned from more densely populated areas to diffuse and dispersed zones (Inostroza et al., 2019). In contrast, urban peripheries could also be rather homogeneous areas, dominated by detached private houses (Boeri and Longo, 2012). Despite structural and functional homogeneity, other negative peculiarities of urban peripheries could be a chaotic development (Bellout

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et al., 2020). The caused soil sealing is leading the loss of open “green” spaces (Spyra et al., 2021) and to decline in the provision of ecosystem services. From the perspective of policy-making, urban peripheries are difficult to deal with as they can stretch over several municipalities, who are in charge of the specific policy-making processes addressing urban peripheries (Spyra et al., 2020). Moreover, as shown by various scholars, due to their dynamic expansions and mixed land uses/covers, urban peripheries are tricky to define as well as difficult to delimitate due to their interdisciplinary character (Bellout et al., 2020; Cattivelli, 2021; Gonçalves et al., 2017). Therefore, methods to delimitate such peripheral areas are complicated to be implemented.

Living in such mixed, peripheral areas, located at or beyond cities’ fringes, where its inhabitants cultivate various lifestyles, land use is dynamically changing and is used for different (often opposing) purposes, leading to conflicting interests and disputes. In our study, we are interested in conflicts emerging in urban peripheries. Our understanding of a conflict is referring to “an active disagreement, as between opposing opinions or needs” (Cambridge Dictionary, 2023). There exist many studies that investigate conflicts in transitional urban peripheries. However, most of the them describe single and specific conflicts in urban peripheries, while only a few studies are using gathered information of many case studies in order to analyze similarities and differences between conflict types. For example, Dadashpoor and Ahani (2019) conducted a review of land-tenure conflicts in urban peripheries, describing the three categories conflicts of interest in land use, conflicts among different parties (individuals and institutions), and legally-related land tenure conflicts. Timár and Váradi (2001) revealed the entanglement of policy between economic interests for real estate and societal needs in Hungary. Dunk et al. (2015) provided a classification of land-use conflicts for the Swiss Central Plateau, and Darly and Torre (2013) discussed conflicts on farmlands in the Greater Paris Region. Scholars stressed the

importance of further research in the field of conflicts in urban peripheries (Gonçalves et al., 2017; Hudalah et al., 2016). In our opinion, a more precise understanding of conflict types in urban peripheries is crucial for policy and planning in such areas and for sustainable futures of cities and metropolitan areas. In addition, there exist no study on European level that analyzed and quantified the conflicts in urban peripheries. This study closes this knowledge gap and contributes to a better understanding of possible conflicts in European urban peripheries. This research was based on a structured literature analysis of peer-reviewed publications referring to Europe. Specific characteristics of conflicts in urban peripheries were identified, striking examples presented, and possible recommendations for policy and planning discussed to counteract conflicts in urban peripheries.

2. Method

The methodological framework of this research was a systematic literature review. Systematic literature reviews are essential for high qualitative research that follows the principles of an objective research (Wetterich and Plänitz, 2021). New theories can be developed, or hypotheses can be tested by analyzing, synthesizing, and summarizing existing work. Furthermore, knowledge frontiers can be identified (Xiao and Watson, 2019). We focused on a thematic synthesis that has the purpose to extend knowledge by extracting themes from the literature, clustering it and synthesizing them into analytical themes. We used Web of Science (WoS) as electronic data base to identify high-quality peer-reviewed literature in the research field. The search terms for the query in WoS were composed of the terms and related synonyms of “urban peripheries”, “conflict” and the European countries. Synonyms for “urban peripheries” were used from Geneletti et al. (2017). The search terms were separated by Boolean operators OR/AND. The asterisk (*)

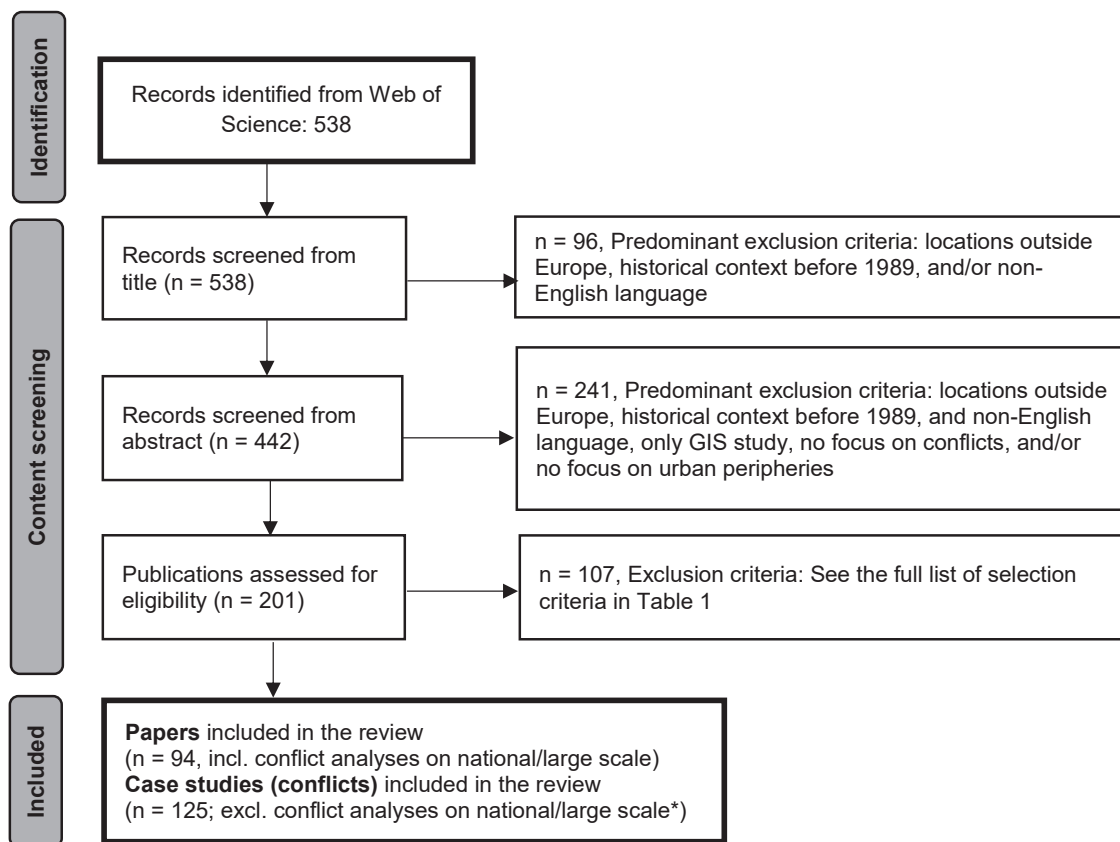


Fig. 1. Work flow of the screening and selection process to identify conflicts in urban peripheries in Europe (template of the "Preferred Reporting Items for Systematic Reviews and Meta-Analyses" - PRISMA diagram from Page et al., 2021). * These case studies were separately treated due to the very large amount of cases (between 51 and 1033 cases) that would cause a statistical distortion.

Table 1
Selection criteria to identify conflicts in urban peripheries in Europe.

Selection criteria	Interpretation key
Peer-reviewed literature in English	-
Publication dates 1990–2022	Historical conflicts in urban peripheries before 1989 (fall of the Berlin Wall) were excluded. Furthermore, a random search in WoS with our search query before 1990 has shown only a few papers. We assume that publications before 1990 were either not yet digitized or the context of urban peripheries was less in research focus.
Location of a conflict in Europe	List of European countries according to the Council of Europe (2023). Used synonyms of “conflict” were: tension, dispute, quarrel, controversy, confrontation, disagreement, trouble, fight, or clash; excluding wars.
Considered as a conflict	Conflicts in urban peripheries that are really existing or that are likely to occur.
Possibility of a conflict	The reader was able to differentiate the study between the core city and the urban periphery. The conflict was at least between two parties, e. g., nature conservation was represented by environmental municipalities or environmental NGOs (non-governmental organizations), and farmland was represented by farmers.
Peripheral location of a conflict	Conflicting parties should be both located within an urban periphery, i.e. not in urban centers or in purely rural areas. Humans should be represented as at least one of the conflicting parties; i.e. we excluded conflicts between two animal species within an urban periphery. A human component in the conflict needed to be addressed, i.e., socially, economically or environmentally driven conflicts; and where specific actors can be identified; e.g., studies were excluded when only statistical changes of land use or air pollution were analyzed.
Parties of a conflict	

Table 2
Analyzed characteristics of the samples about conflicts in urban peripheries in Europe.

Analyzed characteristics	Description
Location	Geographical location of the conflict in Europe
Type of the conflict	Categorization of the conflict (emerged during the analysis)
Topic addressed in the conflict	Subordinated topics of the conflict category (emerged during the analysis)
Description depth and temporal differences of the conflict	If the conflict was described as the main part/ results section of the analyzed paper, as underlying narrative, as large-scale analysis, as hypothetical conflict, as currently existing or solved conflict
Methods used in a specific publication	Literature review / discourse analysis, interviews, questionnaires, statistical analysis, GIS analysis, modelling, observation and other methods
Study type	Qualitative social science (e.g., ethnographic studies, interviews, and observations), quantitative social science (e.g., statistical analysis, and econometrics), natural science (e. g., species counting, molecular analysis and biomass counting), interdisciplinary studies (a mix of methods from social and natural), and literature review (used as a study method)
Wording of urban periphery	Terminologies for urban periphery used by the author(s) of the respective analyzed paper

was used to include different spellings for one word. The selection of the European countries was according to the list of the Council of Europe (2023). In addition, Belarus and Russia, taking the Ural Mountains as European border, were included because they just left the Council of

Europe during the Ukraine war that has started in February 2022. The full search query is shown in Annex 1.

We used the PRISMA diagram (Preferred Reporting Items for Systematic Reviews and Meta-Analyses; Page et al., 2021) to visualize the screening process (Fig. 1). In total, using the search query described in Annex 1, 538 publications were found in the WoS data base in January 2023. The selection of publications was following specific selection criteria that are shown in Table 1. A final set of 94 papers with 125 case studies (conflicts) were identified for further analysis after applying the selection criteria. The cases reported in the quantitative studies on national or large scale were treated separately from the 125 case studies. It was due to the fact that more than 1428 cases were analyzed only in five papers and this fact could have caused a distortion of our data. The other two papers from this set described large-scale quantitative studies, where the total amount of cases was not specified. If several case studies in a specific paper were described, the following criteria were applied: (a) If several case studies in a specific paper had the same conflict category and were not possible to be textually distinguished, they were not separately listed for the analysis. (b) If several case studies in a specific paper had different conflict categories, they were treated as separate case studies in the analysis. (c) If several case studies in a specific paper were described but some of the cases did not show a conflict, they were excluded. (d) If several case studies in a specific paper were described but some of the cases were not located in urban peripheries, they were excluded.

The literature analysis contained semi-quantitative (counting) and qualitative parts (content analysis). The characteristics mentioned in Table 2 were analyzed. The semi-quantitative part was reflected in descriptive statistics. The qualitative part of the content analysis was conducted according to Mayring (2000, 2015). The final set of literature was coded according to main conflict categories and subordinated conflict topics in urban peripheries. A deductive approach was used as first step because a theoretical basis of the context was developed. While reading, predefined codes were complemented by new emerging aspects (inductive approach) and iteratively adapted. MAXQDA, a software for computer-assisted qualitative data analysis, was used to store the papers, to gather information, and to assign the codes to text segments. MAXQDA is used in social science and interdisciplinary studies (e.g., Consoli, 2021; Di Paola et al., 2023; Kuckartz and Rädiker 2021; Mauz et al., 2012). The analysis with the codes contained conflict types, actors, research methods used in the analyzed papers, among others (see the full list in Annex 2, Tables A.1 – A.3). The depth of analysis was based on the content that was provided by the text in the papers, i.e., codes were assigned to the text segments only if the text mentioned the code category and not if the author assumed the conflict. Conflict categories and conflict types as well as actors were shown in alluvial diagrams. Data for the diagram was derived from the codes which were created using MAXQDA. The open-source website RAWGraphs (Mauri et al., 2017) was used to prepare the alluvial diagrams. Excel was used as a tool to gather quantitative information. QGIS was used to show the geographical location.

3. Results

3.1. General classification of conflicts in European urban peripheries

The location of the case studies of conflicts in urban peripheries was distributed among the European countries (Fig. 2). The highest amount of case studies existed in the United Kingdom (18 cases) and France (17 cases), where Paris was the city with the highest amount of conflicts documented in the publications. Between 6 and 11 cases were shown for Spain (11 cases), Sweden (11 cases), Italy (8 cases), and Hungary (6 cases).

Different terms were used in the analyzed manuscripts to describe urban peripheries (Fig. 3A). Most often, papers about conflicts in urban peripheries related to the term “suburban” (29%) but already the second highest group (21%) was counted for a mixture of terminologies that

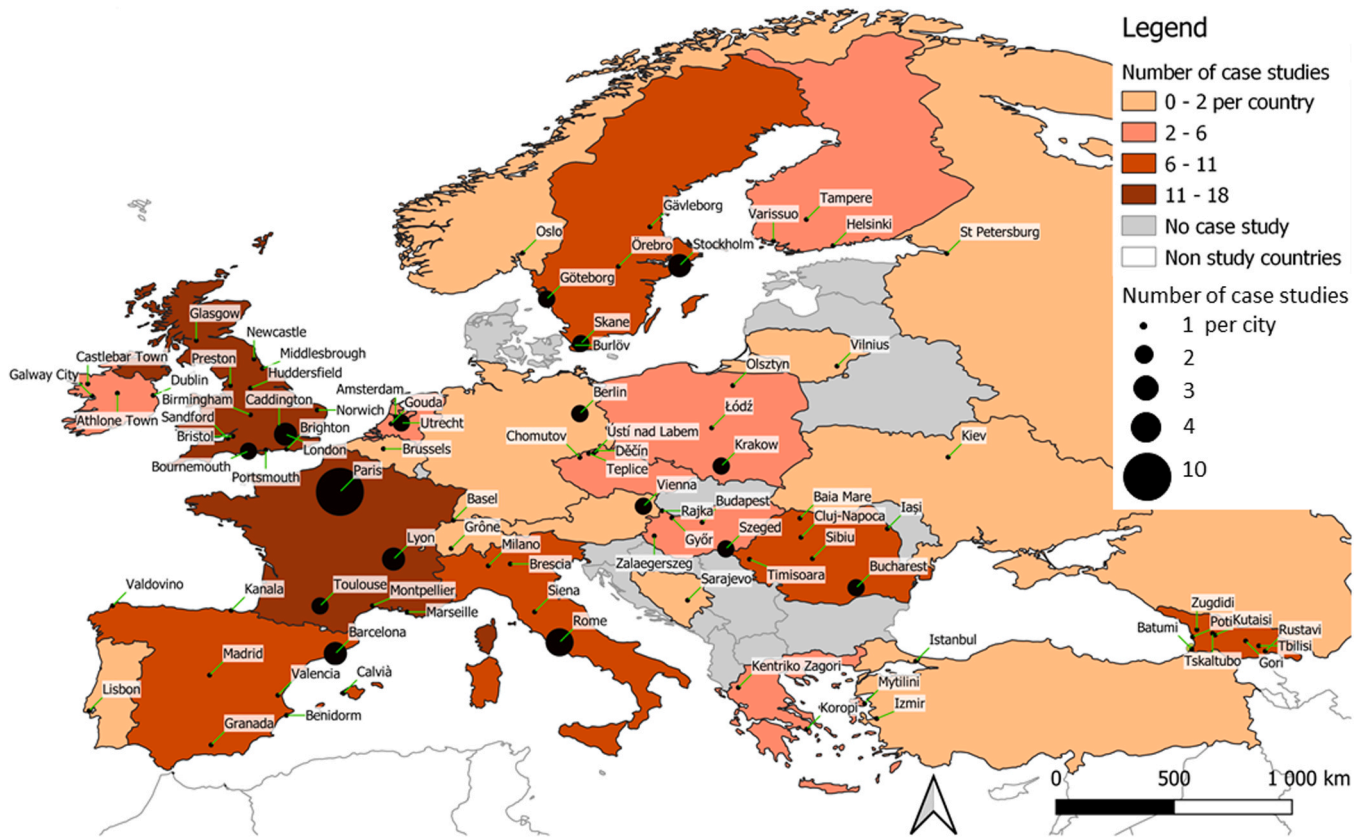


Fig. 2. Location of the case studies of conflicts in urban peripheries in European countries. European countries were taken from the list of the Council of Europe (2023). In addition, Belarus and Russia, taking the Ural Mountains as European border, were included because they just left the Council of Europe during the Ukraine war. The publications including a huge amount of conflicts (> 50) could not be shown here due to amount and the context on national level. Figure designed in QGIS.

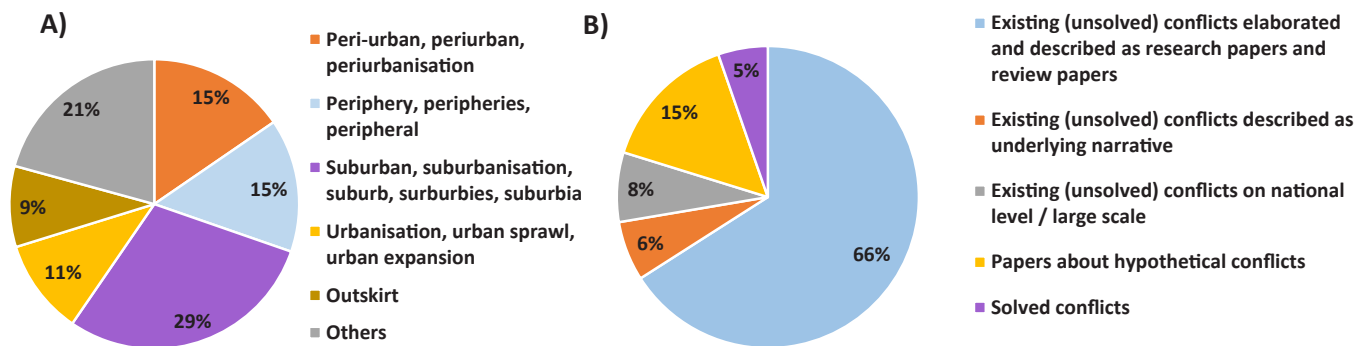


Fig. 3. A: Terms used by the authors of the analyzed papers for describing urban peripheries; multiple counts (different terminologies) per publication were possible. Category “others” include e.g.: banlieue, outer-city, urban-rural interfaces, beyond the administrative boundary of the core city, fast-growing urban fringe region, urban-influenced areas, post-suburban, sprawling cities, metropolitan hinterland, urban edge, urban fringe, surrounding settlements, peri-centre, land surrounded by recently urbanized land, interface between urban and rural, city edge, rural-urban conflict, stages of transition from rural to urban uses, sprawling city, and inside and outside. **B:** Publication content and description depth about the conflict in urban peripheries in Europe was identified. More descriptive statistics are shown in the annex.

were not possible to cluster, e.g. urban-influenced areas, post-suburban, or metropolitan hinterland. Considering the publication year, the publications of conflicts in urban peripheries increased from the year 2011 with a peak in 2020 (Annex Figure A.1). The majority of methods that were used to identify conflicts in urban peripheries were interviews and questionnaires (31%, 54 papers; Annex Figure A.3), followed by statistical analysis (22%, 38 papers) and literature reviews or discourse analysis (24%, 43 papers). Studies from social science were 39% (37 papers; Annex Figure A.2) but we divided this group into studies with qualitative methods from social science, e.g. qualitative interviews and

observations (33%; 31 papers), and studies with quantitative methods from social science, e.g. quantitative surveys with statistical analysis (6%, 6 papers). The studies with qualitative methods from social science were covering mainly the socio-economic and ethnic conflicts. The share of studies with natural scientific methods, e.g., modelling and GIS, were 14% (13 papers); handling mainly the human-wildlife conflicts. Approximately 38% (36 papers) of the papers used an interdisciplinary approach by mixing methods from social sciences and natural sciences.

Four main **general categories of conflicts** in urban peripheries were identified: (1) land-use conflicts that relate to different interest in

Table 3
Description of the conflict topics that emerged from the analyzed literature. Papers with the publication year 2023 were already available online in 2022.

Conflict topic	Description of the existing or recently emerging conflict in urban peripheries	Examples from analyzed papers
House construction	Expansion of new houses in urban peripheries.	Dinter and Roşu, 2021; Hernik et al., 2013; Nae et al., 2019; Perrin et al., 2018
Road construction	Construction of new roads in urban peripheries.	Caparros-Midwood et al., 2019; Torre et al., 2015; Wolny and Żróbek, 2017
Agricultural intensification	Intensified use or frequency of cropland and increased pesticide use.	Ahmed et al. (2011), Clafat et al. (2015), Wästfelt and Zhang (2016)
Changes in land value	Increase in land price or risk of losing land value.	Akimowicz et al., 2020; Perrin et al., 2018; Ramond and Oberti, 2022; Torre et al., 2015
Restriction in recreation	Limitations to use and access natural areas or nature reserves.	Arnberger and Brandenburg, 2007; Castillo-Eguskiza et al., 2017; Heer et al., 2003; Kraxner et al., 2016
Nuisance	Disturbance in urban peripheries.	Cahill et al., 2012; Elgåker et al., 2012; Heer et al., 2003; Scott et al., 2018
Environmental destruction	Damage, degradation or pollution of nature or environmental features.	Hof and Blázquez-Salom, 2015; Nae et al., 2019; Ricart and Rico-Amorós, 2022; Sandström and Elander, 2021; Salata et al., 2022
Risk from the environment or from species	Risks of dangerous incidents for human health caused by ecosystems, natural hazards, or wild species.	Cahill et al., 2012; González-Crespo et al., 2018; Kimmig et al., 2020; Sudmeier-Rieux et al., 2015; Stillfried et al., 2017
Imbalance in administrative power	Diverging or unfair power relations between governance actors, legal contradictions, corruption or administrative misbehavior.	Elvestad and Holsen, 2020; Hognogi et al., 2021; Home, 2002; Nae et al., 2019; Savchuk and Zapototskiy, 2020
Socio-economic imbalance	Imbalanced social status and income related to governance actors.	Bridge, 2006; Cuberos-Gallardo, 2021; Feki, 2007; Hognogi et al., 2021; Moutselos, 2020; Ramond and Oberti, 2022; Ragazzi, 2023
Different cultural values/lifestyle	Imbalanced demographic development and related socio-cultural differences emerging among governance actors.	Crul et al., 2020; Elgåker et al., 2012; Fletcher et al., 2011; Kizos et al., 2011
Ethnic differences	Physical differences related to skin color, language, history, religion, and custom.	Baker, 2019; Castañeda, 2022; Crul et al., 2020; Erman and Eken, 2004; Escafré-Dublet and Hamidi, 2023; Hognogi et al., 2021; Home, 2002; Moutselos, 2020

land use (50% of all papers); (2) socio-economic conflicts that relate to social aspects emerging between governance actors and diverging economic interests (approx. 21% of all papers); (3) ethnic conflicts that relate to race, religion, and custom (approx. 21% of all papers); (4) human-wildlife conflicts relate to confrontations between humans and wild animals (approx. 8% of all papers). Socio-economic conflicts were partially overlapping with ethnic and land-use conflicts and in total, 21 publications were assigned to two conflict types due to the overlapping content.

Different subject matter and description depth about the conflict were identified between the publications (Fig. 3B):

- a) Existing (unsolved) conflicts elaborated and described as research papers and review papers. Most of the papers were found in this group (66% of all papers).
- b) Existing (unsolved) conflicts described as underlying narrative - the conflict was not described in the main/results part of the paper; the main/results part contained, e.g., a program to counteract the conflict (6% of all papers). Here, mainly land-use conflicts were described.
- c) Existing (unsolved) conflicts on national level / large scale. Those conflicts were represented with many cases described in one paper (> 50 conflicts; 8% of all papers). These authors have analyzed between 81 and 180 cases but partially, the exact number of cases was not provided. This group was dominated by land-use conflicts (five out of seven papers).
- d) Hypothetical conflicts, described as potential conflict in the future (is not yet existing), e.g., optimization modelling, scenario modelling, projections or risks (15% of all papers). The majority of human-wildlife conflicts (eight out of nine papers) were found in this group because the risk of damage or disease transmission was described by using references from other case studies. Six land-use conflicts were also found in this group. In contrast, no socio-economic and ethnic conflicts were found in this category because of many ethnographic studies with direct data collection of the conflict on site, e.g., by observation, interviews, or discussions.
- e) Solved conflicts where the conflict itself was described but also the successful conflict resolution. The minority of papers was found in this group (5% of all papers).

3.2. Specific topics of conflicts in European urban peripheries

Within the four general categories of conflicts (land-use, socio-economic, ethnic, and human-wildlife) twelve conflict topics were identified (Table 3) The conflict topics were assigned across the conflict categories and visualized in Fig. 4. “Socio-economic imbalance” was the topic that was most often assigned across the conflict categories (Fig. 4). This topic was also the most often occurring combination with the topic of “ethnic differences” in socio-economic and ethnic conflicts in urban peripheries (Annex Figure A.4).

In the following sections, a few examples are provided for conflict topics, sorted according to the conflict categories land-use, ethnic, socio-economic, and human-wildlife. Due to the fact that some land-use, ethnic, and socio-economic conflicts were overlapping, we have added a paragraph before describing the human-wildlife conflicts.

Most the analyzed papers were describing case studies related to **land-use conflicts** and therefore, most of the conflict topics were shown in this category (Fig. 4). In this category, mainly land-use conflicts regarding topics like house construction and environmental destruction emerged but also conflicts regarding different cultural values/lifestyle, nuisance, and risks from the environment or from species, among others. Land-use conflicts often contained multiple conflict topics in parallel and the original (especially underlying/indirect) causes were often difficult to identify. For example, based on the gathered data, it was difficult to distinguish if a change of a lifestyle from urban to rural has led to the development of housing in former rural areas, economic imbalances between residents and newcomers and/or changing administrative power relations. Therefore, different conflict topics were assigned to one conflict category (see Annex Figure A.4). The most often emerged combination between conflict topics were related to "house construction" and "environmental destruction" as well as between "house construction and "imbalance in administrative power" (Annex Figure A.4).

A classic example of a land-use conflict between house construction and environmental destruction was described by Sandström and Elander (2021). In this case, a new logistic center should be placed next to a Natura 2000 site on the outskirts of Örebro in Sweden. However, differently to other similar examples of construction versus nature

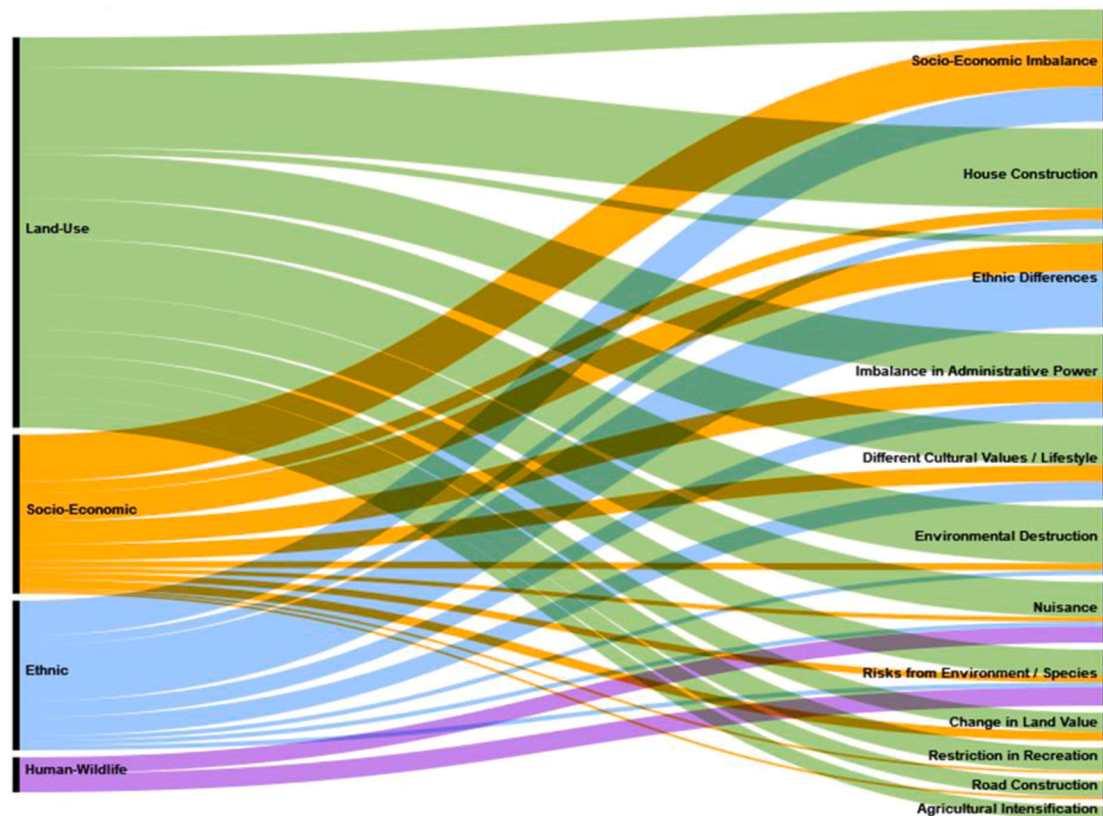


Fig. 4. : Alluvial diagram showing the conflict categories (left) and the specific conflict topics (right). A case study was concerned with several conflict topics. Some papers were counted twice due to overlapping conflict categories. The size of the conflict categories reflects the amount of counts per case study (once per case study where the actor was mentioned) and not the amount of papers. Figure developed with RAWGraphs (Mauri et al., 2017).

conservation, there was no violence of legal regulations and a good communication between the stakeholder groups. In contrast, poor communication, mistrust and different lifestyles caused a land-use conflict between farmers and horse riders in Swedish urban peripheries (Elgåker et al., 2012). This conflict was also overlapping with the socio-economic conflict category due to the socio-cultural connotation. Changes in land use and land cover due to changing lifestyle and different perception of the urban periphery have been also reported by Kizos et al. (2011) between newcomers and farmers in peri-urban – formerly agricultural – areas in Greece and by Fletcher et al. (2011) between citizens, surfers, and tourists for the development of a surf reef at the coast of Bournemouth in England. These few case studies exemplified already the huge diversity of cases describing conflicts in urban peripheries.

Land-use conflicts in urban peripheries related to agricultural intensification were identified in six publications (approx. 11% of the land-use conflicts). Agricultural intensification was including conflicts between farmers on the one hand, and residents, tourists, and environmental NGOs on the other hand. For example, Ahmed et al. (2011) reported for the case of peri-urban areas in Sweden about the excessive usage of pesticides by farmers that has worried neighbors of causing potential health risks. Hof and Blázquez-Salom (2015) showed an example of conflict in urban peripheries for environmental destruction caused by tourism. The authors described a conflicting situation between increasing high-quality tourism that required a higher water supply than the formerly mass tourism and the water demand for agriculture in peri-urban Calvià of Mallorca. The consequence was the privatization of water and higher costs of water supply. As seen in Fig. 4, also imbalance in administrative power have caused land-use conflicts in urban peripheries by misuse of laws and regulations, administrative

misbehavior, or even corruption. This imbalance was representatively described by Savchuk and Zapototskyi (2020) who explained a corruption that has fueled a land use change of valuable ecological land to a cottage settlement in suburban Kiev (Savchuk and Zapototskyi, 2020). The conflict topic "nuisance" covered disturbance in peri-urban settlements or overcrowded land use in urban peripheries by different actors. For example, the damage of cropland by horse riders (Elgåker et al., 2012) or wildlife (e.g., Cahill et al., 2012; Scott et al., 2018) was included in this topic. The conflict topic "risks from the environment or from species" (see Table 3 and Fig. 4) included natural hazards, e.g. flooding (Sudmeier-Rieux et al., 2015) and the risk of disease transmission from wildlife (e.g., González-Crespo et al., 2018; Stillfried et al., 2017).

The quantitative land-use studies on large-scale and national level and with a huge amount of cases handled also many different conflict topics (Darly and Torre, 2013; Dunk et al., 2015; Melot and Paoli, 2016; Timár and Váradi, 2001; van Dijk and van der Wulp, 2010). However, they did not report about land-use conflicts in relation to ethnic differences reflecting that this conflict combination might be less common. All five quantitative land-use studies mentioned road construction and urban development as main conflict topics which was in line with our findings.

Ethnic conflicts handled mainly the interrelated conflict topics socio-economic imbalance and ethnic differences, followed by different cultural values / lifestyles and imbalance in administrative power (Annex Figure A.4). Ethnic conflicts in urban peripheries were often related to violence (e.g., Erman and Eken, 2004; Ekholm and Dahlstedt, 2020; Moutselos, 2020; Selmini, 2016). Underlying causes were cultural differences, different norms, stigmatization, stereotyping, discrimination, racism, negative feelings between residents, and immigrants as

shown for cases in the urban peripheries of Amsterdam (Crul et al., 2020), Dublin (Bowden, 2017), Tampere (Puumala and Maïche, 2021), London (Baker, 2019), Rome (Selmini, 2016), and especially in French urban peripheries (Charmes et al., 2021). Nine papers (32%) described the ethnic conflicts in the “banlieues” of French cities, especially in suburban Paris. The nationwide anti-state riots in the year 2005 were a result of accumulating frustration and lack of prospects, especially of the youth from immigrants and descendants from former French African colonies, e.g. Algeria, Morocco, and Tunisia. These disputes were also a result of the “French ethnicity-blind policymaking” (Moutselos, 2020), meaning the state ignorance, failure of integration, and inability to support equality of life and social cohesion (conflict topic “imbalance in administrative power”; see Table 3 and Fig. 4). Young French Muslims see themselves as French Arabs and therefore as French inhabitant but this perception was said to be neither recognized by the “native” French population nor by representatives of local authorities like the police (Feki, 2007; Ragazzi, 2023). Ethnic conflicts were eleven times (46% of all ethnic conflict cases) mixed with socio-economic conflicts because socio-economic discrepancies can cause dissatisfaction that results in negative views about migrants, e.g., competition for jobs (Erman and Eken, 2004). These confrontations are often happening in the suburbs where socio-economic differences are obvious. Suburbs have sometimes a negative connotation as being not only the spatial but also social periphery. Suburban areas can be inhabited by low-income groups if the living costs in the city center are higher (Amarouche et al., 2021). Our results showed that in addition to that, spatial planning can lead to marginalization of such suburban areas because social housing has been often located there (conflict topic “socio-economic imbalance”; see Table 3 and Fig. 4). For example, Moutselos (2020) reported that badly managed and hardly maintained social housing estates of suburban Paris were causing a locked-in situation for its residents because people cannot pay an accommodation outside social housing. The author has also revealed that the presence of large estates was associated with the occurrence of violence, which is defined by the share of foreigners and the rate of unemployment. Similar relationships related to the feeling of threat from immigrants by residents have been demonstrated by Crul et al. (2020) for suburban Amsterdam. Spatial and therefore, social segregation have been also created by urban sprawl, or spatial planning in other cities, e.g. in the urban periphery of Istanbul (Erman and Eken, 2004) and Lisbon (Cuberos-Gallardo, 2021). In the case of Kontula, the hotspot of immigrants in the peri-urban area of Helsinki, the bad picture of this urban periphery was also drawn and enforced by the media which has stigmatized this district. At the same time, the socio-economic status in Kontula was low but not significantly lower than in other districts of Helsinki (Tuominen, 2020).

The same as for ethnic conflicts, **socio-economic conflicts** were treating mainly the interrelated conflict topics “socio-economic imbalance” and “ethnic differences” but less the “different cultural values / lifestyle” in relation to “ethnic differences”. The conflict topic “imbalance in administrative power” was slightly more emphasized in relation to socio-economic conflicts than for ethnic conflicts (Annex Figure A.4). A socio-economic conflict in urban peripheries regarding an “imbalance in administrative power” in relation to a “socio-economic imbalance” was shown by Gogishvili and Harris-Brandts (2019) for the internal migration in Georgia. Georgians had to escape from armed conflicts in autonomous regions and settled in affordable housing of, e.g. Tbilisi, but they were socially and spatially excluded from public service, education, health, and employment. This isolation was forced by the government because of the relocation into so called “collective centers” (Gogishvili and Harris-Brandts, 2019). Another interesting development of a socio-economic conflict in urban peripheries was reported by Bridge (2006) for the conflict topic “socio-economic imbalance” in relation to “changes in land value” in suburban Bristol. The new middle-class was confronted with the trade-off between quality housing and good education for their children at the same time. The families rather live in undesired bungalows in suburban areas close to highly ranked schools

than in comfortable Victorian houses in the city center where a school satisfying their needs was lacking. This examples also shows that urban development and planning not always fit to the needs of the new emerging middle-class.

The socio-economic conflicts were most often mixed with ethnic and land-use conflict. Therefore, some mixed cases are shown in the following examples. The development process of a mixed **socio-economic and ethnic conflict** (conflict topics “socio-economic imbalance”, “ethnic differences”, and “different cultural values / lifestyles”; see Table 3 and Fig. 4) in the periphery of Hungarian city of Rajka was described by Balizs and Bajmócy (2019). The driving force of the conflict was related to the location of this village close to Slovakia and its capital Bratislava. The new Slovak residents in Rajka, who are commuting for work to Bratislava, have a higher income than the long-established residents of this village and introduced also a different social life (e.g., activity in the community, education, health and social services). In addition, the language barrier was preventing an integration into the local community. These reasons fostered conflicts between newcomers and old residents of Rajka. A **mixed land-use conflict with socio-economic aspects** was shown in Vasárus et al. (2018) for the suburban areas in Hungary. Vasárus et al. (2018) described the case of old residents versus newcomers after new house constructions in peri-urban landscapes who collided due to different expectations from a landscape, different income levels, and lifestyles (conflict topics house construction, socio-economic imbalance, and different cultural values / lifestyles). The situation was worsened by poor public transport, increasing car traffic, lack of sound governance approaches, and financial resources. An example of an **ethnic conflict that was overlapping with a land-use conflict** (only four cases in total identified in our study) was described by Mushaben (2014). Here, the land-use conflict in an outskirts of Berlin was related to the planning of a mosque. On the one hand, this conflict was partially reflecting a “normal” land-use conflict such as the Not-In-My-Backyard (NIMBY) phenomenon (Mushaben, 2014) where residents feared a deterioration of their direct neighborhood and environment due to land use changes. On the other hand, many different actors with extreme views, especially the right wing, were involved making this conflict a “special” case that was mixed with reservation, fear, and even hostility against foreign cultures and norms (conflict topics “house construction”, “socio-economic imbalance”, “ethnic differences”, “different cultural values / lifestyles”, and “imbalance in administrative power”; see Table 3 and Fig. 4).

The **human-wildlife conflicts** in urban peripheries were the only category that was not overlapping with the other conflict categories. They were also part of the hypothetical conflicts because the potential conflicts with humans were rather taken as underlying narrative in the introduction of the publications and citing other existing papers describing the potential conflict. In addition, this category covered only studies from natural sciences. The results’ sections of those papers rather contained species occurrence, collection of species / organic material for population genetic analysis, or stochastic modelling, among others. The description of possible conflicts was only related to the conflict topics “nuisance” and “risk from the environment or from species” (Fig. 4 and Annex Figure A.4), e.g., risk of disease transmission or damage (e.g., Cahill et al., 2012; González-Crespo et al., 2018; Hagemann et al., 2022; Lovari et al., 2017). Conflicts of humans and wild species were observed in urban peripheries of, e.g., Barcelona with wild boar (Cahill et al., 2012; González-Crespo et al., 2018), London with red fox and Eurasian badger (Scott et al., 2018), Siena with crested porcupine (Lovari et al., 2017), and Brussels with geese (Groom et al., 2020).

4. Discussion

As shown in our study, urban peripheries are becoming an important socio-geographical area in terms of living in the future. In such areas, processes of marginalization and related conflicts were observed not only in a spatial term (i.e., in the periphery of urban centers) but also in

the terms of social segregation and deprivation (ESPON, 2013). In contrast, the findings have also shown that urban peripheries are not always spatially disadvantaged or/and socially deprived areas (e.g., Balizs and Bajmócy, 2019), but people also identify themselves with such transitioning peripheral spaces (e.g., Tuominen, 2020). Urban peripheries can be attractive living areas as shown by Vasárus et al. (2018). Conflicts in urban peripheries were reflected in this study as interdisciplinary topic, shown by many interdisciplinary papers and a balanced amount of publications from social science as well as natural science. None of the case studies had only one conflict topic, showing the mingling of different aspects and contexts. Despite this diversity, four main conflict categories (land-use, ethnic, socio-economic or human-wildlife) and twelve conflict topics could be distinguished.

Urban peripheries are prone to be a conflict area due to the different usage mixes and actors (Dinter and Roşu, 2021); like citizens, authorities, ethnic groups, rural land owners, environmental organizations, other / civil organizations, companies, tourists, and wildlife. Predominant actors involved in our analyzed conflicts were citizens, authorities, and ethnic groups (Fig. A.5). Conflicts in urban peripheries between citizens were mainly between newcomers and established residents (e.g., Balizs and Bajmócy, 2019; Fletcher et al., 2011). Conflicts between ethnic groups were (obviously) described in ethnic conflicts in particular, i.e. clashes between immigrants and local “native” residents (e.g., ; Baker, 2019; Erman and Eken, 2004; Feki, 2007). Local authorities were directly or indirectly involved – either conflicts were provoked and reinforced by governmental decisions (e.g., Erman and Eken, 2004; Home, 2002) or authorities were indirectly fueling the ethnic conflict by inactivity and ignorance (Cremaschi et al., 2020; Escafré-Dublet and Hamidi, 2023). The relevant conflict groups of citizens and authorities were especially described in land-use conflicts (e.g., Khoshkar et al., 2018; Manzano et al., 2021). These conflicts often emerged due to the lack of involvement of affected stakeholders in planning decisions. Solved conflicts are best-practice examples on how contrasting views and different interests can be mediated among various governance actors. In the following paragraphs, we outlined a few striking examples to successfully counteract conflicts in urban peripheries by using solved conflicts but also presenting recommendations provided by authors of ongoing conflicts.

4.1. Approaches to solve conflicts in urban peripheries

Similar to the huge variety in conflict types and contexts, recommendations to potentially solve or reduce conflicts in urban peripheries could be not be exhaustively discussed in this section. In addition, it is important to mention that the here discussed policy and planning recommendations are case- and context-specific (Sandström and Elander, 2021). A best-practice example to solve conflicts in urban peripheries focusing on **land-use conflicts** related to house and road construction was presented by van der Stoep et al. (2017) for Krimpenerwaard at the outskirts of Gouda in the Netherlands. This case showed that strategic framing with convincing arguments aligned with inherent interests for urban and rural development of local authorities had empowered the local citizen and contributed to solve a conflict. Additionally, the case of Sandström and Elander (2021) in Örebro in Sweden had shown that carefully planned stakeholder engagement and participatory planning accompanied with relevant environmental impact assessment could lead to solve land-use conflicts related to construction and nature conservation. Besides house construction, also road development could be a possible source of conflict (e.g., van Dijk and van der Wulp, 2010). The construction of a road could cause health issues (noise, pollution) as reported by Torre et al. (2015) for an outskirts of Paris. In this case, residents accepted the land use change after protection measures against noise and pollution were installed – also because they did not fear anymore a price drop in their house value (Torre et al., 2015). Another compromise was the relocation of the road under consideration according to the needs or demands by the local community (Wolny and Żróbek, 2017).

Land-use conflicts in urban peripheries related to environmental destruction and tourism / leisure could be solved by involving residents in decisions related to the nature reserve. Firstly, it increases their support for management and conservation and also leads to a higher acceptance by local residents and higher trust in the administration of the nature reserve (Arnberger and Brandenburg, 2007). Secondly, an improved environmental knowledge is not only important for authorities administering the nature reserve but also for its users. However, Heer et al. (2003) presented a case in a suburban recreational forest area close to Basel that environmental knowledge about the forest ecosystem by different user groups have not reduced the utilization pressure on this forest area. A part of user groups was still not aware of the negative environmental consequences of their recreational activities. Therefore, more and specific educational work regarding the causes and effects of environmental use and behavior should be conducted (Heer et al., 2003).

Land use planning is only effective if planning institutions involved in the planning process are strong (Sudmeier-Rieux et al., 2015). Land use conflicts are difficult to handle if the misuse of laws and corruption have been reported (e.g., Savchuk and Zapototskyi, 2020). In uneven power relations where winners and losers are reported, more participatory and collaborative approaches are required. The losers are in many cases environmental associations and citizens (Pietta and Tononi, 2021) while often at the same time strong lobbyists such as companies are advantaged in conflicting situations. While leading a participatory process, the local authority, who should act in a fair way, has the power to decide which actors are involved in such processes. The planner should be regarded in this case as a mediator, regulator, and negotiator to balance societal power (Pietta and Tononi, 2021; Sandström and Elander, 2021). Tools for analyzing trade-offs of diverging objectives in land-use could support the decision-process. For example, Pareto-optimized land use planning could be an approach that helps to better adjust the diverging interests, contrasting aims, and emerging risks in spatial planning (Caparros-Midwood et al., 2019). However, incompatible planning or trade-offs are sometimes unavoidable (e.g., Caparros-Midwood et al., 2019; Schulp et al., 2022).

Ethnic conflicts in urban peripheries had different possible solutions but that were most often contested by citizens, ethnic groups, or scholars. The antidiscrimination policy of France can be taken as example because it has been described and its effects discussed in various publications (e.g., Castañeda, 2022; Escafré-Dublet and Hamidi, 2023; Feki, 2007; Ragazzi, 2023). The difficulty behind solving a historically long existing conflict starts with the understanding of discrimination and, therefore, also antidiscrimination and related tools. However, people understand discrimination differently. This conceptual vagueness was considered at first as a strength where different “stakeholders will coalesce for a plan under the false impression that everyone agrees” (Escafré-Dublet and Hamidi 2023, p.10) but Escafré -Dublet and Hamidi (2022) sees that this approach will weaken antidiscrimination policy in the long run. Census can be used to analyze and assess the level of ethnic differences but rather captures economic factors than country of origin, therefore, ignoring the existing conflicts of race, religion, and custom. This so-called colour-blindness by authorities inhibits the deeper analysis of conflicts and their origins and hiding the assessment of potentially vital measures against discrimination. Local authorities need to be much more sensitized and culturally trained, developing skills of handling cultural differences (Kundu, 2001; Pless and Maak, 2004).

Feki (2007) also explained that “understanding the role of Islam in the challenges facing French Muslims” (p. 757) is a good starting point to solve the problems in France. Considering the historical development (analyzing the colonial past) of immigration and intergenerational development can generate a better understanding of the motivation, feelings, and specific behavior of French Muslims. The contrast to color-blindness is the counter-radicalization described by Ragazzi (2023). This policy approach was initiated by the French government to

prevent terrorism. Specific sensitive (especially suburban) areas should be identified where potential conflicts could occur. Police is over-represented in these areas. This policy approach forms a trade-off in citizenship and balancing between prevention and repression – “between the interests of the youth “at risk” and the interests of society against “risky” youths” (Ragazzi, 2023). However, the state alone is helpless if the French society is not willing to change their stereotypes. Antidiscrimination has to be taken up by societal activities (Escafré-Dublet and Hamidi 2023) as for example described in (Epstein, 2016) through an intercultural theater, rap, opera, arts, and multimedia. The everyday intercultural confrontation improves to cope with ethnic differences but it is neither comfortable nor easy (ibid.). France has a long way to go solve the question of “victim and culprit” (Escafré-Dublet and Hamidi, 2023; Ragazzi, 2023). In contrast, ethnic conflicts due to language barriers could be easier solved by integration courses and language training. However, Puumala and Maïche (2021) showed a case in suburban Tampere in Finland where just speaking the local language does not mean that the migrant would be accepted by the community. The social component needed to be added. For example, Finns would not expect a person with migration background going to the Finns tradition of sauna sessions. The adaptation to local norms and traditions can help in the social integration. In addition, the preparation and sharing of food as a social function of trust and hospitality has strengthened the neighborhood of different ethnic backgrounds (Puumala and Maïche, 2021, p. 820).

Similarly, divers and difficult to grasp was the finding of **solutions for socio-economic conflicts** in urban peripheries. Tough cases of socio-economic conflicts such as resettlement and governmentally provoked isolation as described in Gogishvili and Harris-Brandts (2019) are hard to handle. There is a need for a better integration of the displaced people in the education and employment system and an adequate financial support for the fundamental needs of health, safety, and sanitation. These basic demands can be transferred to any case of socio-economic conflict. In addition, in an ideal world, justice and power are equally and legally distributed and free from lobbyism and populist tendencies as described by Erman and Eken (2004) for the mixed ethnic and socio-economic conflict in suburban Istanbul.

In comparison to ethnic and socio-economic conflicts in urban peripheries, **solutions of human-wildlife conflicts** in urban peripheries according to the analyzed papers were rather pragmatic because they were related more often to management. Possible solutions were adapted behavior, e.g. less feeding (e.g., Olsson et al., 2017; Groom et al., 2020), higher awareness of people for possible human-wildlife conflicts and risks (Kimmig et al., 2020), adaption of the landscape, e.g. fencing (Groom et al., 2020), sterilization, or capture / hunting (Amendolia et al., 2019; Cahill et al., 2012; Massei et al., 2011).

In relation to **all categories of conflicts**, there is a need to rethink administrative power and redistribute societal power during policy and planning processes in urban peripheries (Pietta and Tononi, 2021; Sjögren, 2021). Sharing power and, consequently, also sharing responsibility is a step to more co-creation in policy making and planning in peripheral contexts. It is more difficult for citizens to justify a complaint regarding specific circumstances if they are those who have caused the existence of this circumstance. In addition, local authorities might not be aware of existing conflicts during the planning or policy making process and complaints only occur when there is no possibility anymore to intervene. Legal regulations exist on EU level to involve citizens in planning, e.g. the directive on environmental impact assessments (Directive, 2011/92/EU, 2011; Directive, 2014/52/EU, 2014) and the Strategic Environmental Assessment (Directive, 2001/42/EC, 2001). However, there exist always different definitions and levels of participation (e.g., compare Arnstein, 1969; Wright, 2010), i.e. top-down and bottom-up (Guarneros-Meza and Geddes, 2010; Swyngedouw, 2009). In addition, it has to be noted that not every democratically taken decision will lead to social acceptance (Perrin et al., 2018). The development and recognition of multiple lines of argumentation,

regularly exchanging respectful and trustful with affected governance actors (e.g., Khoshkar et al., 2018), and also more specifically the justified but also socially sensitive framing (van der Stoep et al., 2017) contributes to find a common ground in navigating through a decision process where hopefully most or even all stakeholders agree on. Furthermore, a lucky circumstance and smart use of a windows of opportunity can appear as exemplified for Krimpenerwaard (van der Stoep et al., 2017).

4.2. Implications for policy and planning

In general, conflict prevention and conflict resolution are important tasks in the frame of policy-making and planning (FriEnt, 2019; Torre et al., 2014). Otherwise, it would be hard to imagine sustainable futures of landscapes – considering the fact that the basic driver for urban expansion, namely land use demand for housing, infrastructure, economy, leisure and comfort, among others, is still high (European Environment Agency, 2023; Zhang, 2016). The majority of conflicts described in this study were land-use related. It underlines the importance of legal and regulatory instruments (for the definition see IPBES, n. d.), specifically including planning and zoning, which are the basic approaches addressing aspects of land use (Ronchi et al., 2019). Legal and regulatory instruments should also focus on foreseeable possible conflicts, e.g. in the frame of forecast approaches (Spyra, 2014), and not only on mitigating the existing conflicts. Such an approach might be effective in controlling urban sprawl and improving the management of urban peripheries in Europe due to the inclusion of sanctions and restrictions but such “oppressive” approaches should be complemented with participatory planning and / or other types of policy instruments. Legal and regulatory instruments are often the dominating group of the considered policy instruments in European urban peripheries (Spyra et al., (submitted)). Especially conflicts of economic interests could be approached by economic and financial instruments that have the capacity to modify governance actors’ behavior towards sustainable aims. In contrast, for ethnic conflicts in urban peripheries, a lot of sensitization towards the situation, heritage, culture of various societal groups and their specificities are needed among all governance actors. Such knowledge-based sensitization could be supported especially by social and cultural policy instruments. Wildlife-related conflicts in urban peripheries could be mainly handled by socio-cultural and legal instruments (Roth et al., under review). However, the described conflicts are often mixed between various categories. Due to this aspect and to the multiplicity and the dynamic emergence of most of the conflicts, a considerably designed but flexible policy mix could be a reasonable mitigation approach (Spyra et al., submitted).

In addition, the first step in the process of conflict mitigation, not only in urban peripheries, should be the identification of the cause, type, and involvement of the conflict – ideally in combination with participatory processes (Brown et al., 2017). The involvement of all relevant groups of governance actors in a policy-making process is crucial as shown in our analysis. Coordinated multi-level governance involving different actors and governance levels could belong to the solutions – also related to conflicts in cross-boundary urban peripheries (Frank et al., 2017). In this situation, multi-level governance, i.e. a new or improved collaboration between different administrative units, could better respond to different conflict types (Spyra et al., 2020; Sheng et al., 2023).

Policy and planning related to conflicts in urban peripheries should be also equipped with monitoring activities observing to what extend conflicts are mitigated. Such monitoring activities should also cover the causes of conflicts, i.e., to observe what kind of drivers exist, how they correlate to existing and potential conflicts, and which drivers of possible conflicts could emerge in future. In this way, it would be also possible to observe hypothetical conflicts (which were also identified in our study). Nevertheless, what complicates this approach is the difficulty to determine an emerging process as a conflict, a driver of a conflict, or a mix between both. This shows very complex governance

situations where the causes are mixed with the process and the consequences. It should be also noted that the here mentioned implications are non-exhaustive and rather general due to the fact that the specific suggestions of solutions in our study are context-specific (see Section 4.1). Moreover, only 5% of the described conflicts in our study were “solved”. This fact limits the discussion about possible solutions and successful instruments of solving a conflict. In addition, the implementation of possible solutions might be even more challenging in the Global South because these countries rather face other or more serious conflicts in urban peripheries (see, e.g., Dadashpoor and Ahani, 2019).

5. Conclusion

The analyzed papers reflected the huge diversity in context and topics of conflicts in European urban peripheries that have been also reflected in the variety in locations, actors, methods, and overlapping conflict categories and topics. Therefore, a generalization from our results was limited. The majority of publications in European urban peripheries were related to land-use conflicts. In addition, land use conflicts were most often related to many different conflict topics while ethnic and human-wildlife conflicts were rather handling a few conflict topics. The described human-wildlife conflicts in urban peripheries were only related to hypothetical conflicts as reflected in the description of these papers and, therefore, as underlying narrative of a paper as well as by specific reference to other publications. Ethnic conflicts in urban peripheries were especially described for France and especially for suburban Paris. We have discussed a few technical and deliberative solutions to solve the conflict in urban peripheries. Mediating through conflicts in urban peripheries do not fundamentally differ to conflicts in other locations even though it could be even more complex because more actors and administrative levels might be involved due to the undefined nature and interwoven character of mixed land-uses and different socio-economic domains. A conflict can increase if affected stakeholders are neglected or excluded. In addition, treating many different aspects separately and, thus, lacking a systemic thinking, could cause the emergence of new conflicts. However, increasing complexity could also limit the identification and implementation of adequate solutions for conflicts in urban peripheries. Therefore, a case-specific involvement of governance actors who are sensitized for different points of view and an operational context are recommended.

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Table A.1

The primary codes for the qualitative content analysis that were used for code combinations (see Table A.2 and Table A.3. The codes are alphabetically sorted).

Primary Code	Definition
Agriculture	Aspects that relate to activities and features of farming.
Citizens	People who live in a specific city or urban periphery.
Conflict	Aspects that relate to tensions, disputes, quarrels, controversies, confrontation, disagreements, troubles, fights, or clashes. These conflicts can include also to some degree violent conflicts but no wars.
Countermeasures	Aspects that relate to actions by local authorities to solve the conflict. This code was a sub-code of “Legislation_Laws”.
Cultural reasons	Aspects that relate to socio-cultural behavior and differences, e.g., changes in lifestyle.
Demographic reasons	Aspects that relate to differences in population density and age structure.
Driver	Aspects that relate to the underlying direct and indirect driving forces that have caused the conflict.
Economic reasons	Aspects that relate to monetary issues and / or differences in income and employment.
Ethnic groups	People who share common attributes such as traditions, language, history or religion.
Gender	Aspects that relate to gender; especially when women where emphasized.
Health	Aspects / factors that relate to health. In this study was a focus on aspects / factors that could make people sick – including pollution and waste that could impact health and including unpleasant feelings of noise.
Land Ownership	Aspects that relate to land tenure.
Land Use Type	Aspects that relate to different types of land use and land cover, e.g. grassland, cropland, and forest.
Legislation_Laws	Aspects that relate to governance and policy – including governmental organizations or local municipalities as actors.
Leisure	Aspects that relate to enjoyment of places during the non-working time, especially sports.

(continued on next page)

CRediT authorship contribution statement

Kleemann Janina: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Struve Berenike:** Conceptualization, Investigation, Methodology, Writing – review & editing. **Spyra Marcin:** Conceptualization, Methodology, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Secondary data were used: published peer-reviewed scientific literature.

Annex 1. : Search terms

TS= (("urban sprawl*" OR "urban fringe*" OR "outskirt*" OR "suburb*" OR "urban peripher*" OR "exurban*" OR "peri-urban*" OR "periurban" OR "urban edge*") AND ("conflict*" OR "tension*" OR "dispute*" OR "quarrel*" OR "controvers*" OR "confront*" OR "disagreement*" OR "trouble*" OR "fight*" OR "clash*") AND Europe* OR ("German*" OR "Austria*" OR "Switzerland" OR "Swiss" OR "Netherlands" OR "Dutch" OR "France" OR "French" OR "Belgi*" OR "Luxembourg*" OR "Poland" OR "Polish" OR "Denmark" OR "Danish" OR "Czech" OR "Ital*" OR "Spain" OR "Spanish" OR "Portug*" OR "United Kingdom" OR "England" OR "Iceland*" OR "Swed*" OR "Norw*" OR "Finland" OR "Finnish" OR "Slovakia*" OR "Slovenia*" OR "Hungar*" OR "Croatia*" OR "Bulgaria*" OR "Romania*" OR "Bosnia and Herzegovina" OR "Albania*" OR "Georgia*" OR "Aserbajdschan*" OR "Serbia*" OR "Montenegro" OR "North Macedonia*" OR "Gree*" OR "Estonia*" OR "Latvia*" OR "Lithuania*" OR "Belarus*" OR "Ukrain*" OR "Ireland" OR "Irish" OR "Turkey" OR "Turkish" OR "Russia*" OR "Cyprus" OR "Andorra" OR "Monaco" OR "Moldova*" OR "Moldavian" OR "Malta" OR "Liechtenstein" OR "San Marino"))).

Annex 2

Table A.1 (continued)

Primary Code	Definition
Methods	Aspects that relate to the methodological approach of the study – including conceptual frameworks.
Nature Conservation	Aspects that relate to the protection and preservation of nature and the environment.
Other organizations	Organizations that are neither governmental organizations nor for nature conservation, e.g. civil organizations.
Potential conflict	Aspects that relate to planning scenarios where a conflict could occur or hypothetical conflicts. This code was a sub-code of “conflict”.
Security	Aspects that relate to security for people – including economic security, risk of violence or hazards.
Tourism	Aspects that relate to holiday and visits of places that the person has not or rarely visited before (to distinguish from leisure); including tourists as actors.
Urban Expansion	Aspects that relate to the growth of urban settlements and housing.
Wildlife	Untamed individuals of a species.

Table A.2

Code combinations for conflict topics for the qualitative content analysis. House and road construction were separated later. Risk form species were merged with risk from the environment in the analysis of this paper.

Conflict topic	Code or code combination
House construction and Road construction	Urban Expansion AND Conflict
Agricultural intensification	Agriculture AND Conflict
Changes in land value	Economic reason AND Land Ownership AND Conflict
Restriction in recreation	Nature Conservation AND Leisure AND Conflict
Nuisance	Wildlife AND Conflict
Environmental destruction	Nature Conservation AND Conflict
Risk from the environment	Nature Conservation AND Conflict AND Security
Risk from species	Wildlife AND Conflict AND Health
Imbalance in administrative power	Legislation_Laws AND Conflict
Socio-economic imbalance	Economic reason AND Conflict
Different cultural values / lifestyle	Cultural reasons AND Conflict
Ethnic differences	Ethnic groups AND Conflict

Table A.3

Code combinations for actors for the qualitative content analysis.

Actors	Code or code combination
Tourists	Tourism
Wildlife	Wildlife
Farmers	Agriculture AND Land ownership
Authorities	Legislation_Laws
Companies	Economic reason AND Land Ownership
Environmental organizations	Legislation_Laws AND Nature Conservation
Ethnic groups	Ethnic groups
Citizens	Citizens
Other / civil organizations	Other organizations

Annex 3

Annex 3

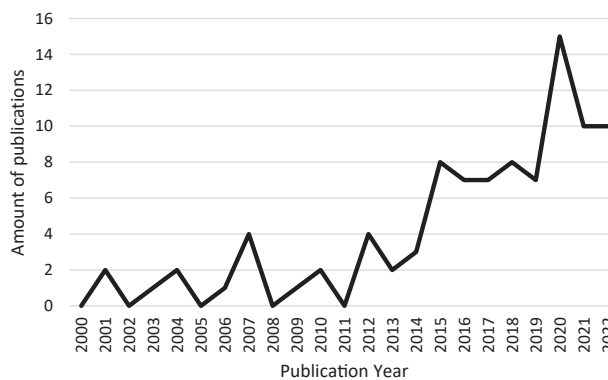


Fig. A.1. Publication year of the analyzed papers about conflicts in peri-urban areas.

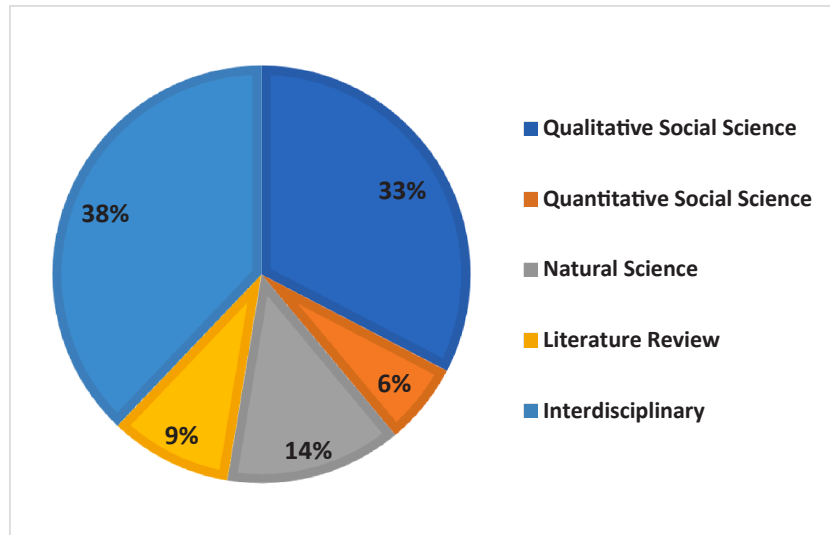


Fig. A.2. Share of publications from social science, natural science, interdisciplinary studies and literature reviews.

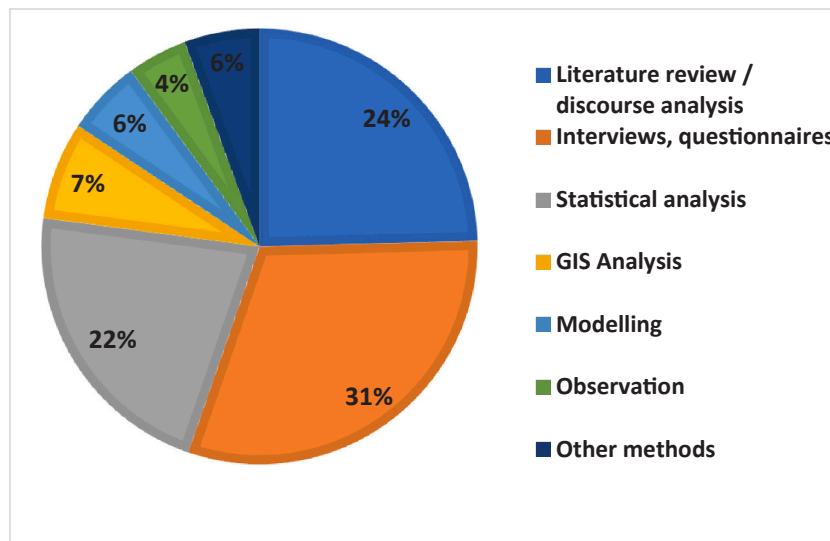


Fig. A.3. Methods that were used in the papers to identify peri-urban conflicts; multiple counts per publication were possible. Other methods were molecular analysis, population genetic analysis, user activities analysis, focus group discussion and workshops, “soundwalks” and social network analysis.

Land-use conflicts	ID	A	B	C	D	E	F	G	H	I	J	K	L
House construction	A		5	2	4	2	3	13	6	11	9	10	3
Road construction	B			0	2	0	4	4	4	0	1	2	0
Agricultural intensification	C				2	0	1	5	1	1	0	3	0
Changes in land value	D					1	1	4	1	1	3	2	0
Restriction in recreation	E						2	6	1	3	2	1	0
Nuisance	F							7	5	0	1	5	0
Environmental destruction	G								5	7	5	5	1
Risk from the environment or from species	H									2	1	2	1
Imbalance in administrative power	I										6	6	3
Socio-economic imbalance	J											7	2
Different cultural values / lifestyle	K												2
Ethnic differences	L												

Socio-economic conflicts	ID	A	B	C	D	E	F	G	H	I	J	K	L
House construction	A		1	0	1	0	0	3	1	4	4	3	1
Road construction	B			0	1	0	0	1	0	0	1	1	0
Agricultural intensification	C				0	0	0	0	0	0	0	0	0
Changes in land value	D					0	1	1	0	0	3	1	0
Restriction in recreation	E						0	0	0	0	1	0	0
Nuisance	F							0	1	0	0	1	0
Environmental destruction	G								1	3	3	1	0
Risk from the environment or from species	H									1	2	1	0
Imbalance in administrative power	I										8	2	4
Socio-economic imbalance	J											6	13
Different cultural values / lifestyle	K												4
Ethnic differences	L												

Ethnic Conflicts	ID	A	B	C	D	E	F	G	H	I	J	K	L
House construction	A		0	0	0	0	0	0	0	4	3	2	3
Road construction	B			0	0	0	0	0	0	0	0	0	0
Agricultural intensification	C				0	0	0	0	0	0	0	0	0
Changes in land value	D					0	0	0	0	0	0	0	0
Restriction in recreation	E						0	0	0	0	0	0	0
Nuisance	F							1	0	0	0	0	2
Environmental destruction	G								1	1	1	0	1
Risk from the environment or from species	H									1	2	0	1
Imbalance in administrative power	I										6	3	6
Socio-economic imbalance	J											4	14
Different cultural values / lifestyle	K												8
Ethnic differences	L												

Human-Wildlife Conflicts	ID	A	B	C	D	E	F	G	H	I	J	K	L
House construction	A		0	0	0	0	0	0	0	0	0	0	0
Road construction	B			0	0	0	0	0	0	0	0	0	0
Agricultural intensification	C				0	0	0	0	0	0	0	0	0
Changes in land value	D					0	0	0	0	0	0	0	0
Restriction in recreation	E						0	0	0	0	0	0	0
Nuisance	F							1	6	0	0	0	0
Environmental destruction	G								0	0	0	0	0
Risk from the environment or from species	H									2	0	0	0
Imbalance in administrative power	I										0	0	0
Socio-economic imbalance	J											0	0
Different cultural values / lifestyle	K												0
Ethnic differences	L												

11 to 14 cases
6 to 10 cases
1 to 5 cases

Fig. A.4. Topic combination matrix of conflicts in urban peripheries. The numbers reflect the amount of combined mentions in the specific publications.

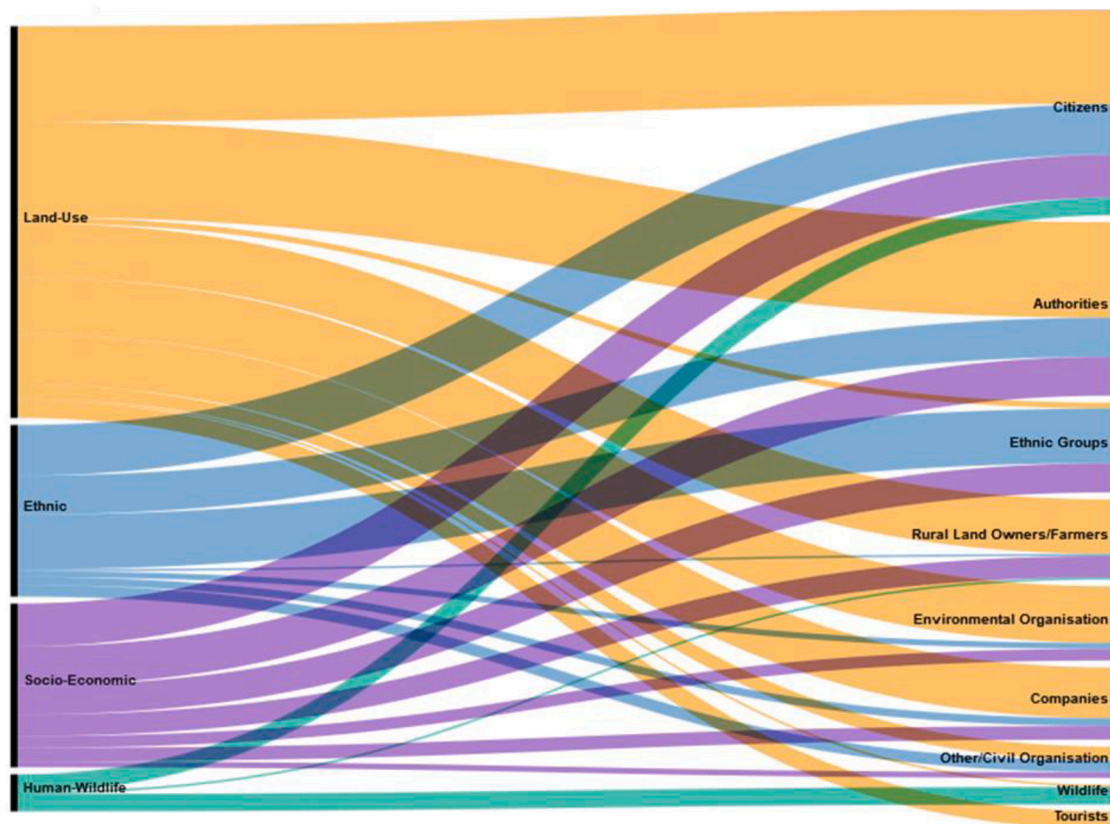


Fig. A.5. Alluvial diagram showing the conflict categories (left) and the actors (right). Some papers were counted twice due to overlapping conflict categories. A case study was concerned with several actor groups. Please note that the size of the conflict categories reflects the amount of counts (once per case study where the actor was mentioned) and not the amount of papers. Figure developed with RAWGraphs (Mauri et al., 2017).

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