

LITERATURE REVIEW ON RIVER RESTORATION IN THE PERSPECTIVE OF SOCIAL MOVEMENTS

Siti Zunariyah

Sociology Department Sebelas Maret University

Surakarta, Indonesia

Email: zunariyah@staff.uns.ac.id

<https://orcid.org/0000-0003-3611-2728>

ABSTRACT

The river restoration movement is a new variant of the mainstream environmental movement. This issue is not supported by existing studies although it is shaped by social, economic, political and ecological interests at local and global scales. This article is an attempt to make a preliminary assessment of the academic literature occurring in several countries in the perspective of the environmental movement. This article uses the method of searching scientific articles or literature reviews, namely reading, summarizing, and reporting the source of previous data found on certain topics written by previous researchers. Grouping articles in the perspective of social movements consisting of resource mobilization, political opportunities, framing and collective identity and social networks is carried out in order to produce critical notes as well as recommendations for further research.

The results of the literature review show that research on river restoration movements with various perspectives of social movements has explained the process of resource mobilization and political processes. Various actors and actors are mobilizing resources; develop concrete and symbolic strategies and actions; conducive policy changes; and active community initiatives to encourage policies that enable the river restoration movement to remain sustainable. With the perspective of resource mobilization, the process of how organizational resources are distributed and exchanged can influence the role played by different actors in social networks

Keywords: *River Restoration, Environmental Movement and Literature Review*

A. INTRODUCTION

This literature review makes a preliminary assessment of the available academic literature on river restoration in several countries in the perspective of environmental

movements. River restoration is a response to river degradation that has occurred in recent decades as it has been altered by humans to provide irrigation and flood regulation, hydropower, port network transportation, and drinking water supply.¹ Rivers have also been heavily modified by urban growth and demand for water through the drainage and disposal functions of industrial and household waste, thus causing uncontrollable pollution and pollution.² According to recent research, nearly 80% of the world's population is currently exposed to threats to the security of degraded river water habitats.³ The World Water Council estimates that more than half of the world's rivers are polluted or at risk of drying up. In addition, clean water reserves in the world are less than 20% due to habitat loss which is the main cause of extinction of aquatic ecosystems. This condition is a driving factor for the emergence of a global agreement between countries to form the 2020 UN Decade on ecosystem restoration so that urban areas are able to adapt to the impacts of climate change.⁴ River restoration is also used as one of the pillars supporting the Sustainable Development Goals (SDGs) on clean environmental arrangement, maintained ecosystems and clean air and water quality.⁵ That way, the river restoration agenda finds its urgency.

In general, there are five concepts of river restoration in improving the existence and restoring the essence of the river, namely hydrological restoration, ecological restoration, morphology, socio-economy, and institutional and regulatory restoration.⁶ The five elements of river restoration emphasize the importance of the interaction between structure and function, creating the dynamics and diversity of systems and the challenges presented for river restoration.⁷ Unfortunately, restoring certain structures and forms of rivers will require additional measures to manage the natural relationship between the resulting structure and function. These five elements still require an assessment of what needs to be restored, which involves identifying suitable reference conditions for reference, including taking into account the local conditions and needs of the community.⁸ Thus, river restoration must also consider its social context both with regard to the recognition of democratic values that have been widely accepted and practical questions about the acceptance of ecosystem services as a result of river restoration by those living around the river.⁹ Unfortunately the study of river restoration tends to be dominated by ecological aspects rather than social aspects that have an important role in Success.

Support for strengthening social aspects in the study of river restoration comes from Andrew Light who reminds that river restoration is based on the main idea that to restore rivers successfully has long-term effects, so communities must be involved and have a strong

commitment to restoration efforts.¹⁰ Similarly, Mathias Gross stated that river restoration can be viewed as a civic-led public project that emerged in the form of a social movement. Well-practiced river restoration will have the potential to foster democratic values and practice critical assessment of socially organized claims through social movements.¹¹ River restoration is also referred to as an attempt to redefine spaces from a privileged cultural and ideological point of view and has historical links to the preservation discourse of the mainstream environmental movement.¹² That way the study of social aspects in river restoration finds its relevance.

The connection between river restoration and the environmental justice movement can be traced back to recent developments in the environmental movement in Western Europe and the United States. The environmental movement emerged and developed as an alternative form to realize environmental awareness. The environmental movement has transformed from a grassroots group fighting radically for structural reform to a mass movement that is institutionalized into an organization and works in a neo-liberal order. In Eastern Europe and former Soviet countries the environmental movement also flourished during the 1980s due to its articulation with claims to national sovereignty, but after 1989 it collapsed and now has no institutional basis.¹³ Nevertheless, the environmental movement is considered successful in achieving its goals over the past few decades while being able to substantively garner broad public support, especially in Western Europe and America even among the oldest social movements.¹⁴ The environmental movement is seen as a political-cultural movement to solve environmental problems that encourages the common awareness of all actors to be involved in efforts to solve them.

The mainstream contemporary environmental movement, originating from the rising middle class, along with the changing consumer culture of the Europe Post-World War II emergence of pesticide-free food as an effort to preserve nature became the main emphasis of this movement. An attempt to escape from dense, busy urban environments to the suburbs in search of tranquillity through outdoor recreation within areas considered wilderness. But ironically, this movement has also triggered a massive increase in consumer waste production and habitat expansion through suburban expansion.¹⁵ Furthermore, although the enactment of environmental laws in the 1960s and 1970s was largely due to political pressure exerted by these movements, these laws often ignored the interests of poor groups and people of colour. In many cases these laws are exacerbated by the uneven distribution of environmental quality.¹⁶ The environmental justice movement emerged in the late 1970s

and early 1980s as a political, cultural and economic response to the disproportionate environmental hazards that occurred between rural and urban communities as well as between the poor and between people of color.¹⁷

The environmental justice movement criticized the mainstream (traditional) environmental movement, which is a movement that grew out of a sense of concern to protect nature and other natural resources for future generations. Meanwhile, the environmental justice movement not only considers civil rights, human health rights and the disruption of their livelihood systems due to ecological damage, but also considers conservation, conservation and service to nature as its scope. Thus, the main concern of the environmental justice movement is seen as broader than the mainstream environmental movement.¹⁸

The complexity of environmental problems marks a decline in social resilience of the community, especially in disadvantaged groups. Therefore, since the 1990s a number of groups such as the Sierra Club and Nature Conservancy have begun to acknowledge and correct their neglect of disadvantaged populations.¹³ Elitism in the mainstream environmental movement seems to marginalize their attention to environmental justice issues. Klinge and Taylor in Tomblin (2009) point out the predominance of conservationist political roots bias in the environmental movement, prompting some grassroots movement groups to accommodate the ecological restoration movement as part of the environmental movement's agenda in the last 20 years. Not unlike the environmental justice movement, the emergence of the grassroots ecological restoration movement was able to throw a political and intellectual break in the mainstream environmental movement, albeit in a much more subtle way.¹² For Keith Bowers (2005), former chairman of the International Society for Ecological Restoration, ecological restoration is about restoring a sense of awe and respect for the environment through direct participation, because river restoration is a reframed environmental movement. Furthermore, its proponents praise the ecological restoration movement as a middle ground that can reduce the tension between conservation goals and utilitarian conservation practices inherent in mainstream environmental movements.¹⁹ Thus, a literature review of the river restoration movement can bring new knowledge about the ecological restoration movement while strengthening its position as a new variant of the environmental movement.

B. METHOD

This article uses a scientific article search strategy or literature review, namely reading, summarizing, and reporting previous data sources found on certain topics written by previous researchers.²⁰ By conducting this literature review, it can be known the results of previous research that has a relationship with the topic being studied. In this literature review the article search used databases from Google Scholar, Wiley Online Library, ScienceDirect, and Taylor & Francis Online. The scientific article sought is research that examines river restoration spread across various countries. The keywords used are: ("river restoration"), ("environmental movements"), and ("river restoration movements" or "river social movements"). Article criteria are limited to publications of the last 20 years in the form of scientific articles and research reports. Once the articles are collected, the next step is to group the articles in the perspective of social movements consisting of resource mobilization, political opportunities, collective framing and identity and social networks. The five categories were analyzed to find trends in frequently used and infrequently used perspectives. In the context of the river restoration movement, this method has been used to summarize global trends in river restoration,²¹ identifying forms of utilization of environmental services after river restoration.²² Unfortunately, the environmental movement's perspective on river restoration is still underdeveloped. That way, this literature review is able to open opportunities for themes and research topics that can be carried out in the theme of the river restoration movement.

C. RESULT AND DISCUSSION

The study of the river restoration movement in the perspective of social movements that have been carried out is divided into four approaches, namely through the perspective of resource mobilization and political processes; the perspective of framing; the perspective of collective identity; and the perspective of networks. The first group, through the perspective of resource mobilization and political processes can be found in research by John Hinck (2010) who describes the social process of the Bronx river restoration movement in New York. The actor of this movement is the Bronx River Alliance which aims to divert the ecological function of the river and restore habitat for otters that are an endemic species. The chosen movement strategy is the action of cleaning the river body from garbage and waste, arranging the riverside area as a tourist facility and environmental education media. The

group is also aggressively raising funds for a number of parties for the sustainability of the movement, even pushing the river restoration agenda in the political agenda of the local government. In its development, this group transformed into a "voice of the river" which represents the voices of river interests to remain protected from damage, even this group has been institutionalized in the form of a Foundation.²¹

Further research by Suharko and Kusumadewi (2020) in their article entitled Civil Society Organizations and River Restoration: A Study on the Movement to Collect a Strand of Garbage in the Karang Mumus River in Samarinda City. The actors of this movement are Civil Society Organizations (CSOs) spearheaded by Misman who aim to restore rivers damaged by critical land, river siltation, flood intensity and reduce water quality and biodiversity. The chosen strategy was in the form of a symbolic movement by picking up a piece of garbage in the river as an entrance to arouse public awareness. In addition, this movement also carried out river cleaning and environmental education actions through river schools which were carried out regularly and published on social media. As a result, a number of supports and awards came from various parties, both the government, NGOs and the general public.²²

The resource mobilization approach contained in the two studies mentioned above, implies that the river restoration movement does not only rely on the process of resource mobilization in both material and non-material forms. In addition, this movement also builds the mobilization process at the government level by taking advantage of political opportunities and drafting regulations that support river restoration. Regarding the process of mobilizing resources and the political process, the process of building cooperation and alliances between actors is formed to expand wider support. Both of these studies reinforce the idea that social networks work through a process of exchanging good resources to form social movements.²³

Meanwhile, the approach to the political process can be found in research by Heejin Han (2015) on the importance of the political process in the restoration movement in the four major rivers tends to be counterproductive to the democratic system prevailing in Korea. A non-participatory, top down and centralistic approach is the approach of policy makers to restore rivers buried for decades. Although a number of clashes took place between planners and environmental managers against environmental activists and Korean civil society. The strong agency of some Korean leaders, however, has significantly boosted the movement's

progress. Thus, the strong state interest in restoring urban river ecosystems is precisely the main supporting factor compared to the interests of society at large.²⁴

Clark (2007) explains how political opportunities to restore rivers grow and develop as progressive policies go hand in hand with emerging climate change policy politics. The birth of a conducive policy cannot be separated from the role of various stakeholders, so that stakeholder collaboration is also an option in the river restoration movement. Institutionally, the river restoration movement is able to provide a choice of collaborative strategies between interested parties and various layers of movements. Collaboration allows them to sit together and equalize their views, ideas, ideas and even interests to find better solutions. The collaboration of these parties can be a means of social learning between the parties as well as a channel and medium for dialogue on various possible conflicts of interest that arise from various parties.²⁵

Research by Theresa Woody (1993) on the dynamics of The Sierra Club as a grassroots environmental organization pursuing a conservation agenda through lobbying, litigation, education and electoral politics. Through the "Save Our Everglades" campaign, the organization is strengthened by science-conservation links and includes efforts to protect, enhance and restore aquatic ecosystems. This effort succeeded in forming a coalition of environmental communities to lobby Congress to be given the authority to restore the river through the Water Resources Act (WRDA) of 1986. Through the cooperation and involvement of scientists, the Army Corps, environmental activists from different regions, localities and communities, the ecological integrity of the Kissimmee river can be restored only with a holistic approach to the form and function of the previous ecosystem. The Kissimmee River restoration campaign is an excellent example of scientists and conservationists combining the resources at their disposal to transform public policies that benefit the environment. Not only campaigns as a form of networking are developed, but their sustainability is strengthened through existing regulations. Thus, the ability to build alliances and social networks between actors becomes part of the political process for the sustainability of the movement through existing regulations.²⁶

The second group, the framing perspective in the river restoration movement can be found in the research of Arjen E. Buijs (2009) which considers that the river restoration movement gains support because of the framing process of discourses and issues developed. There are three framing developed, namely; (i) framing that focuses on cultural heritage and place attachments; (ii) an interesting framing of nature, focusing on nature as an attractive

living space and the intrinsic value of nature; and (iii) rural framing with a focus on rural values, agriculture and cultural heritage. Opposition to river restoration plans stems from the framework of rural framing. People who use this framework oppose safety arguments for river restoration and highlight potential threats to a sense of place and agriculture. Meanwhile the project initiator's focus on biodiversity and safety did not resonate well among local communities, due to their differing views on nature. So that a representative perception of local communities is needed so that strategic alliances can be built between the community and the initiators of the movement. Although a number of negative effects of river restoration related to natural aesthetics are likely to cause resistance from the community, compensation in the form of benefits of ecosystem services resulting from river restoration can gain wider support. That way, there is a framing that is appropriate and acceptable to the community so that the river restoration movement can be realized. This research provides important lessons for efforts to build networks through networks of meaning and certain discourses as driving factors for river restoration movements.²⁷

Furthermore, the framing perspective used by Jonathan Long, Aregai Tecle and Benrita Burnette (2003) sees framing against myths, metaphors and social norms as able to facilitate collective action and as the basis for ecological restoration movements. The framing of the White Mountain Apache Tribe's experience is demonstrated as a deep-rooted cultural foundation and motivates river restoration efforts through the historical story of the time of creation of water bodies into the landscape and how honoring them is through naming and placing as markers. In addition, traditional healing principles and agricultural traditions help guide modern restoration techniques. Thus, the resulting framing is in the form of a metaphor that illustrates how the stability of the relationship between ecological, social and health dimensions based on culture as the basis of river restoration practices. This research is able to inspire how the interrelationship between nature and humans through the promotion of river maintenance that upholds existing cultural traditions. This movement is able to spread knowledge to young people so as to provide new hope for efforts to restore the health and productivity of river ecosystems collectively.²⁸

Discourse framing strategies can also be found in the work of William M Adams, Martin R Perrow and Angus Carpenter (2004) explaining two contrasting discourses in the restoration and management of river ecosystems, namely material discourse and aesthetic discourse related to floodplain management. Both discourses are driven by different groups of scientists whereas materials discourses tend to be driven by groups of engineers through

landscape changes that have tended to be dominant since 1990. Furthermore, the discourse underwent a shift in the midst of public awareness of the importance of aesthetics and appreciation for nature. This shift in discourse is represented by biologists who see the importance of biodiversity restoration in addition to floodplain restoration. In its development, the presence of the two discourses contested each other even though in the end the two discourses had to be presented simultaneously in the river restoration movement.

The third group, the perspective of collective identity formation can be found in research by Anru Lee (2007) on cultural identity approaches that can be played in river restoration movements amid the search for local identities that are deteriorated in global discourse. Through the formation of unique and different local characteristics, the restoration movement was able to gain broad support and participation from waga so as to assist the formal mechanism process in public involvement as a model for urban river restoration. In addition, efforts to build collective identity are also carried out through ecological language conversations that help them create a strong political discourse that not only fundamentally challenges the legitimacy of the central government, but also forces the country's central government to rethink and reshape the foundation of Taiwan's national identity which in turn helps environmental conservation efforts. Since identities are created and shaped through social relationships, networks play an important role. They build and strengthen individual identities and give them a political awareness that allows them to get closer ideologically to specific political issues.

The perspective of collective identity in the river restoration movement is both a source of meaning and a person's experience as well as a process of constructing meaning based on cultural attributes.³⁹ As a spirit of soul, the identity of the local language used by movement activists becomes capital to communicate the movement process including recognition of indigenous peoples' knowledge about how to care for and restore rivers contributes to the sustainability of the movement. That way the movement process can affect the solidity of the tissue form based on mutual recognition. Some of these arguments reinforce Diani's (2002) idea of movement as a form of non-hierarchical network of organizations with boundaries defined by collective identity, that is, by the mutual recognition of actors as members of movements linked by distinctive cultures and solidarity.

Next is a study by Colen A. Fox et al (2017) which describes the Tainui Tribe community fighting for environmental justice through recognition of indigenous knowledge. Through the formation of a collective identity, the Tainui Tribe made efforts to care for and restore

the Waikato river damaged by urbanization and agriculture and the construction of seven dams. Many cultural and historical sites have been lost and damaged, even though the Waikato river is very valuable for this tribal community. For the Tanui Tribe, the Waikato river is a tupuna (ancestor), which has mana (prestige) and in turn represents the mana and mauri (life force) of the tribe. The river is also regarded as an ancestor, as an inseparable creature and is the basis of the tribal and cultural identity of the Waikato-Tainui people. Community links with the river were severed since 1860 when royal military forces invaded their territory and made extensive use of the Waikato and Waipaa rivers. The construction of new settlements and agriculture developed along the river corridor. Although the region contributes to economic growth in New Zealand, the Waikato Tainui have seen a decline in their wealth of eels and anchovies, which for generations have been their source of livelihood. Waikato Tainui negotiated with the kingdom so that the river could be managed jointly with the principle of mana oteawa (health and welfare of the river) and mana whakahaere (health and welfare of the people). With the formation of collective identity, recognition of indigenous rights can be realized.²⁹

The fourth group, the network perspective was used by Paul. J. Kinder Jr. (2017) who researched the effectiveness of North Virginia's Upper Shavers Fork (USF) river restoration governance system by exploring the relationship between the structure and dynamics of social networks underlying river restoration performance. This study used retrospective Survey and Social Network Analysis (SNA) methodology to evaluate the evolution of social networks in USF river restoration over time (before, during and after restoration). The results show the emergence and persistence of adaptive and polycentric governance structures in restoration efforts, the core-periphery pattern persists in the same three main organizations and holds the most central network position over the time period that the study has. Centrality is able to show the power, influence and leadership that a person has in the movement. Various attributes, professional background, proximity to the restoration site and organizational affiliation will explain its ability to obtain a position in its network. USF river restoration is able to present a portrait of a holistic, integrative, top down and centralized river restoration paradigm shift moving to a more decentralized and adaptive structure. This research provides empirical results that link the effectiveness of natural resource management with network structure and dynamics to guide river restoration efforts in other regions in the future. However, much more empirical evidence is needed to compare the structure and dynamics of similar networks over time (longitudinal) and over different

geographic regions. Moreover, the study only analyzes the most central organizational groups in the form of triad relations and ignores other forms of relations that would be related to the effectiveness of adaptive and effective natural resource governance systems.³⁰

Meanwhile, Yi Jen Shie et al (2013) conducted a study entitled *An Analysis of Policy Networks in Kao-Pin River Restoration Movement*. The first phase of the study used Rhodes' typology of policy networks to categorize the membership of complex movement participants. The second stage uses a dialectical model of policy network theory from Marsh & Smith to analyze complex interactions, e.g., protest, alliance, competition, and coordination, between governments, professionals, environmental groups and interest groups. Research continues to verify the interplay of environmental policies, policy networks, participants, and policy outcomes of Kao-Pin River governance. The alliance of the Kao-Pin River restoration movement and the anti-dam movement is an influential movement group in Southern Taiwan. Almost all environmental organizations are involved in this network and they are also a minority group that is considered unfavorable to the policy-making process. With this minor position, they mobilize scattered social resources, organize networks interactively and intensively to gain public legitimacy and trust and draw public attention to environmental issues. In its development, the social networks formed also gave birth to influential (central) groups in the movement. They are able to organize networks so that they are more interactive and efficient in formulating river restoration policies. This means that the group is able to develop intensive interaction skills with other groups so as to give birth to alliances and coalitions. Nevertheless, despite the success of forming alliances and coalitions, the network-forming elements are limited to the perspective of policy networks, and have not looked at other elements.

Study by Simona Lee Perry, B.S (2009) on local knowledge-based ecosystem restoration in the area around degraded urban rivers, namely the Lower Neponset and Estuary rivers in the harbor of South Boston, Massachusetts. The results show that recognition of socio-cultural diversity in local residents' interpretations of Lower Neponset River restoration is important for environmental managers, planners, and local decision-makers to recognize ecological and economic development "best practices". The patterns of convergence and interpretive divergence between environmental communities observed in GIS analysis suggest possible ways to break through existing conflicts using symbolic space. Thus, the conflict that occurs in the restoration of the lower Neponset river is more than just a technical or biophysical problem in the form of how to best manage public access, conserve ecological

resources, protect the river from development and return native flora and fauna to the river. However, the conflict of urban river restoration is closely related to how local residents project and interpret the collective meaning of the river landscape and its surroundings. The study recommends that environmental managers, planners, and local politicians and decision-makers give equal consideration to socio-cultural, political, economic, and ecological factors around urban rivers and the emergence of a diversity of restoration meanings can be a guide to move towards ethical and socially and ecologically sustainable environmental restoration and management practices. An important note of the study is that different interpretations of environmental problems lead to different policy preferences and proposed solutions. Failure to identify, understand, and validate such differences can lead to unexpected or unnecessary conflicts both between local residents and between local residents and experts.³¹

Research by Matiaz Ramirez et al (2020) on the dynamics of place-based social movements and networks of science and technology-based social movements facilitated by scientists, activists and local communities. Using a case study approach on social movements in defense of urban wetlands in the city of Bogota. A mixed method was chosen that included interviews, data visualization and semantic analysis of research agendas and social movement priorities while simultaneously being used to measure the social impact of science and technology on movements. Efforts to improve urban habitats and protect public resources (wetlands) not only involve active participation of grassroots groups but are also based on science and technology systems that are important, flexible and relevant to community needs. Two key concepts are used, namely (1) the concept of conflict to distinguish social movements from other forms of collective action of civil society related to the development of institutions in policy framing; (2) The concept of bricolage is used to explain how heterogeneous networks of actors achieve alignment of goals with limited resources to construct new socio-technical configurations. Through the principles of bricolage, expansion of collective action and formation of local alliances, which bring together diverse actors including local academics. Organizational structures based on place-based networks for "mobilized publics" represent particular expressions for collective action on civil society. It has the ability to overcome local barriers in developing community action based on bonds of social solidarity. That is, alliances between civil society and academia can create new platforms for community engagement in reframing the concept of socio-ecological systems beyond the plans of urban planners. However, the presence of

heterogeneous actor networks is still based on common places, efforts to dissect other elements that make up actor networks have potential that should also be explored.³²

Research by Mafasha Maharoof (2011) on how a number of river restoration networks in various countries develop information networks through media through their websites. Researchers map the actions, programs and activities owned by each network through their official website. Based on its findings, a total of 330 river restoration network members have been identified in the European Centre for River Restoration (ECRR) network and are targeting membership to reach 1000 so that the range of movement becomes wider. Using a network perspective, this study conducted two kinds of analysis. The first analysis provides geographic network coverage and the second provides functional coverage of networks/centers to spread the word about river ecological restoration, how successful their approach is and the technical, cultural, social and economic constraints they face. These experiences resulted in recommendations being presented to the ECSR so that they could be formulated more globally and gain international recognition. Furthermore, they made a SWOT analysis to determine the effectiveness and efficiency of the recommendations produced so that they could be forwarded at a wider network level. With this process, each network member is able to gain mutual learning and improve the organization's ability to carry out river restoration movements. However, this study relies on mapping social networks sourced from abstract websites so that it has not explored the concrete dimensions of existing networks. The elements forming networks are still based on knowledge and information as resources (internal to the organization) that form the movement network but because networks are built have different socio-political backgrounds (external), the elements of the political process as network builders do not receive attention.³³ Thus, the position of social networks is not only important as a bridge of interests, but also a strategic instrument to extend public support and participation in the river restoration movement.

D. CONCLUSION

A number of studies on river restoration movements with various perspectives of social movements have explained the process of resource mobilization and political processes. Various actors and actors are mobilizing resources; develop concrete and symbolic strategies and actions; conducive policy changes; and active community initiatives to encourage policies that enable the river restoration movement to remain sustainable. With the perspective of resource mobilization, the process of how an organization's resources are

distributed and resource exchange can influence the role played by different actors in social networks.³⁴

It is also important to look at the dynamics of competition between movement organizations as a potential source of fragmentation in networks.³⁵ In fact, differences in framing strategies can also affect the structure and pattern of bonds within the social networks formed.³⁶ Framing the benefits of river restoration becomes an entry point to garner community support; Support for river restoration movements is also obtained if it involves framing culture in ecological, social and health dimensions; And the most important thing is also the framing of material and aesthetic dimensions so that the movement is increasingly accepted by the public at large. Thus, various forms of framing that have been carried out serve the framework as well as the preference of movement discourse framed by actors,³⁷ so as to facilitate efforts to form collective identity.³⁸

Referring to the research mentioned above, a common thread can be drawn. Social networks in river restoration movements that occur in a number of countries generally involve a number of environmentalist individuals and organizations acting as actors and agencies. In its development, there was an expansion of movement actors who not only placed humans in the central position of the movement, but also other living things such as otters (biotic) and even rivers (abiotic) were also represented in a number of forums to fight from damage and degradation. The network structure formed can occur between individuals, between organizations and between individuals and organizations. The network structure formed results in the position of actors being centralistic and decentralized as well as convergence and divergence. Network structures are formed through a process of conflict that can threaten the existence of networks and coalitions that are able to maintain network sustainability. Network dynamics are not only determined by network structures and patterns, but are also determined by diverse temporal and spatial contexts and networks are constantly evolving. The evolution is influenced by internal and external factors of the network.

Network forming elements can be resources that are used jointly between network members in the form of knowledge, skills, experience and collective identity. Other network-forming elements are the political system that allows the river restoration movement to work as well as the network's ability to form a political system that supports the river restoration movement. The conflictual elements that emerge in the network are colored by contestation of discourses and interests related to river restoration. The ability to frame certain discourses

and interests has led towards different river restoration goals. Thus, the network of river restoration movements involves a number of actors and actors who form the structure and pattern of the network. Network dynamics occur along with various forming and conflictual elements at work that have implications for river restoration movements.

When referring to the definition of a social movement as a network of informal interactions between a plurality of individuals, groups or communities involved in political or cultural conflicts on the basis of a common collective identity, it is necessary to develop a typology of forms of collective action through the analysis of river restoration movement networks. In the context of the environmental movement, there are certain steps to distinguish it from other collective actions; (1) identify alliance patterns, i.e. structures of collaboration between organizations at any given time; (2) look for indications of drivers of collective identity by exploring the continuity of collaboration over time and the extent to which mutual recognition occurs; (3) assess the conflictual nature of the interactions that take place in the network. The social network perspective is not only a framework to see how networks function to intervene in the participation process of individuals and groups but also a means of exchanging resources between actors so that a network of movement actors is formed. This process of resource mobilization that emphasizes rationality and structure is important to track as a networked process through a number of preferences for framing the discourse of selected movements so as to facilitate the process of collective identity formation. Thus, the network of movement actors is not only about the bonds formed by movement actors who have the instrumental basis of the movement, but the structure of the network of actors is also formed through the similarity of meanings, discourses, ideologies, goals and even collective identities. For this reason, actor networks are able to provide a bridge between the micro and macro dimensions of movement through mechanisms and dynamics of movement that are reproduced over time. Not to maintain the network structure formed, but the network of actors allows the emergence of creative and transformative agencies so that the results of the river restoration movement can be widely accessed.

E. ACKNOWLEDGMENT

This work was supported by grants from the Non-State Budget Funds Universitas Sebelas Maret Indonesia Fiscal Year 2024 Number: 194.2/UN27.22/PT.01.03/2024.

F. REFERENCES

- ¹ Wade R. The management of common property resources: Collective action as an alternative to privatisation or state regulation. *Cambridge J Econ.* 1987;11(2):95–106.
- ² Perini K, Sabbion P. *Urban Sustainability and River Restoration.* Urban Sustainability and River Restoration. John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, United Kingdom; 2017.
- ³ Vörösmarty CJ, McIntyre PB, Gessner MO, Dudgeon D, Prusevich A, Green P, et al. Global threats to human water security and river biodiversity. *Nature.* 2010;467(7315):555–61
- ⁴ Brown LR, Cuffney TF, Coles JF, Fitzpatrick F, McMahon G, Steuer J, et al. Urban streams across the USA: Lessons learned from studies in 9 metropolitan areas. *J North Am Benthol Soc.* 2009;28(4):1051–69.
- ⁵ Frascaroli F, Parrinello G, Root-Bernstein M. Linking contemporary river restoration to economics, technology, politics, and society: Perspectives from a historical case study of the Po River Basin, Italy. *Ambio [Internet].* 2021;50(2):492–504. Tersedia pada: <https://doi.org/10.1007/s13280-020-01363-3>
- ⁶ Maryono A. *Restorasi Sungai.* Gadjah Mada Press Yogyakarta; 2007.
- ⁷ Theiling CH, Janvrin JA, Hendrickson J. Upper mississippi river restoration: Implementation, monitoring, and learning since 1986. *Restor Ecol.* 2015;23(2):157–66.
- ⁸ Kondolf GM, Pinto PJ. The social connectivity of urban rivers. *Geomorphology [Internet].* 2017;277:182–96. Tersedia pada: <http://dx.doi.org/10.1016/j.geomorph.2016.09.028>
- ⁹ Eden SE, Tunstall S. Ecological versus social restoration? How urban river restoration challenges but also fails to challenge the science-policy nexus in the United Kingdom. *Environ Plan C Gov Policy.* 2006;24(5):661–80.
- ¹⁰ Light A. I . Hegemony and Democracy How Politics in Restoration Informs the Politics of Restoration. *Management.* 1994;12(2):140–4.
- ¹¹ Gross M. *Science Studies 2/2002 New Natures and Old Science: Hands-on Practice and Academic Research in Ecological Restoration.* *Sci Stud (St Bonaventure).* 2002;15(2):17–35.
- ¹² Tomblin DC. The ecological restoration movement: Diverse cultures of practice and place. *Organ Environ.* 2009;22(2):185–207.
- ¹³ Brulle RJ. *Agency, Democracy, and Nature.* Agency, Democracy, and Nature. 2018.
- ¹⁴ Mertig AG, Dunlap RE. Environmentalism, new social movements, and the new class: A cross-national investigation. *Rural Sociol.* 2001;66(1):113–36.
- ¹⁵ Rootes C. *Environmental Movements; Local, National and Global.* Routledge; 2014. 1–23 hal.

- ¹⁶ Buttel FH, Gottlieb R. Forcing the Spring: The Transformation of the American Environmental Movement. Vol. 24, Contemporary Sociology. 1995. 51 hal.
- ¹⁷ Schnaiberg A, Pellow DN, Weinberg A. The treadmill of production and the environmental state. *Res Soc Probl Public Policy*. 2002;10:15–32.
- ¹⁸ Anguelovski I, Martínez Alier J. The “Environmentalism of the Poor” revisited: Territory and place in disconnected glocal struggles. *Ecol Econ* [Internet]. 2014;102:167–76. Tersedia pada: <http://dx.doi.org/10.1016/j.ecolecon.2014.04.005>
- ¹⁹ Aronson J, Clewell A, Covington W, Harris J, Higgs E, Hobbs RJ, et al. SER International Primer on Ecological Restoration | resources | Society for Ecological R ... Page 1 of 7 SER International Primer on Ecological Restoration SER International Primer on Ecological Restoration | resources | Society for Ecological R ... Page. *Ecol Restor*. 2004;1–7.
- ²⁰ Luxton I, Sbicca J. Mapping movements: a call for qualitative social network analysis. *Qual Res*. 2021;21(2):161–80.
- ²¹ Hinck J. The Bronx River Alliance: A Model Community Action Organization And an Internship in Development. 2013;(2010).
- ²² Suharko S, Kusumadewi CDM. Organisasi Masyarakat Sipil dan Restorasi Sungai: Studi pada Gerakan Memungut Sehelai Sampah di Sungai Karang Mumus di Kota Samarinda. *J Sociol Reflektif*. 2019;14(1):81.
- ²³ Diani M. Networks and Social Movements: A Research Programme. *Soc Movements Networks Relational Approaches to Collect Action*. 2003;
- ²⁴ Jun KS, Kim JS. The four major rivers restoration project: Impacts on river flows. *KSCE J Civ Eng*. 2011;15(2):217–24.
- ²⁵ Clark BT. River restoration in the American West: Assessing variation in the outcomes of policy change. *Soc Nat Resour*. 2009;22(5):401–16.
- ²⁶ Woody T. Grassroots in Action: The Sierra Club’s Role in the Campaign to Restore the Kissimmee River. *J North Am Benthol Soc*. 1993;12(2):201–5.
- ²⁷ Buijs AE, Arts BJM, Elands BHM, Lengkeek J. Beyond environmental frames: The social representation and cultural resonance of nature in conflicts over a Dutch woodland. *Geoforum* [Internet]. 2011;42(3):329–41. Tersedia pada: <http://dx.doi.org/10.1016/j.geoforum.2010.12.008>
- ²⁸ Jonathan Long AT and BB. Cultural Foundations for Ecological Restoration on the White Mountain Apache Reservation. *Conserv Ecol* 8(1) 4 [online] [Internet]. 2003;8(1). Tersedia pada: <http://www.consecol.org/vol8/iss1/art4%0ASynthesis>
- ²⁹ Lee A. Southern Green Revolution: Urban Environmental Activism in How does access to this work benefit you? Let us know ! Southern Green Revolution : Urban Environmental Activism in Kaohsiung , Taiwan. 2007;
- ³⁰ Kinder Jr. PJ. Social Capital Structure and Dynamics in Stream Restoration: A Social Network Analysis Approach to the Upper Shavers Fork, West Virginia. ProQuest Diss

Theses [Internet]. 2017;72(10):126. Tersedia pada:
http://sfx.scholarsportal.info/guelph/docview/1900975851?accountid=11233%250Ahttp://sfx.scholarsportal.info/guelph?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&genre=dissertations+%2526+theses&sid=ProQ:ProQuest+Dissertations+%2526+The

- ³¹ Perry SL. More than one river: Local, place-based knowledge and the political ecology of restoration and remediation along the Lower Neponset River, Massachusetts. ProQuest Diss Theses [Internet]. 2009;240. Tersedia pada:
http://sfx.scholarsportal.info/guelph/docview/304924632?accountid=11233%255Cnhttp://sfx.scholarsportal.info/guelph?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&genre=dissertations+%2526+theses&sid=ProQ:ProQuest+Dissertations+%2526+The
- ³² Ramírez-Agudelo NA, Anento RP, Villares M, Roca E. Nature-based solutions for water management in peri-urban areas: Barriers and lessons learned from implementation experiences. *Sustain*. 2020;12(23):1–36.
- ³³ Maharoo M. How Can The Message of Ecological River Restoration be Best Brought out Content. *Dienst Landelijk Gebied Centraal Case*; 2011. 1–82 hal.
- ³⁴ Krinsky J, Crossley N. Social Movements and Social Networks: Introduction [Internet]. Vol. 13, *Social Movement Studies*. Taylor & Francis; 2014. hal. 1–21. Tersedia pada:
<http://dx.doi.org/10.1080/14742837.2013.862787>
- ³⁵ McCarthy JD, Zald MN. Resource Mobilization and Social Movements: A Partial Theory. *Am J Sociol*. 1977;82(6):1212–41.
- ³⁶ Mische A. Cross-Talk in Movements: Reconceiving the Culture-Network Link. *Soc Movements Networks Relational Approaches to Collect Action*. 2003;
- ³⁷ Benford RD, Snow DA. Framing processes and social movements: An overview and assessment. *Annu Rev Sociol*. 2000;26(May 2021):611–39.
- ³⁸ Melucci A. The new social movements: A theoretical approach. *Soc Sci Inf*. 1980;19(2):199–226.
- ³⁹ Webster F, Castells M. The Power of Identity. Vol. 49, *The British Journal of Sociology*. Wiley-Blackwell, A John Wiley & Sons, Ltd, Publication; 1998. 671 hal.