

RESEARCH ARTICLE



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Social Capital in Collective Action on Water Resources Management in Buleleng, Bali, Indonesia

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ABSTRACT

Many studies have shown that community social capital supports sustainable natural resource management. This study demonstrates the relationship between social capital and collaborative management of the environment. This study was conducted in Bali's Buleleng Regency using a survey methodology. Research data were collected for six months, July – December 2022. The study results show that people in eight villages are in the "Den Bukit" area and carry out collective action "*Atas Nama Air.*" This collective action took place in the last year after strengthening social capital. Strengthening social capital is carried out by community leaders and supported by government intervention through Social Forestry programs. The findings of this study suggest that community leaders' capacity and social capital, as well as government support for encouraging sustainable natural resource management, should be strengthened.

Introduction

Sustainability in natural resource management is not only about granting management rights to local communities but also about how the capacity of the community as the leading actor can optimize its utilization [1–3]. The goal of "sustainability" in community management calls for a particular amount of social capital [4]. Social capital development can lead to the cooperative management of other common-pool natural resources [5]. Actor and public perspectives indicate a positive correlation between social capital and protected forest sustainability [6]. Other studies have found that various social capital measures can be used to measure the state of forests [7]. The main components of participative and sustainable community development are social capital and local indigenous people [8], indicating that a community with a high level of social capital is capable of sustainable resource management [9–11].

Collective action becomes more challenging and, hence, less frequent in the absence of roles and procedures for decision-making and resource mobilization [12]. People are more confident in investing in collective action when social capital is high in formalized groups because they know that others will do the same [13]. A barrier to collective action in water initiatives is the need for more social capital [14,15]. Social capital and collective action are reciprocal [16,17]. Social capital can be a more representative framework for understanding and describing collective action [18]. Social capital with trust, norms, and networks can improve community management effectiveness and facilitate coordinated actions [19]. Another study found that a high level of social capital significantly affects a high level of collective action [20]. In communities with strong social capital supported by government intervention, it is effortless for communities to take collective action [21].

Previous studies have shown that social capital is closely related to collective action. Several studies state that the two concepts are reciprocal [16,17]. Some studies have proven that the relationship between these two concepts is directly proportional [20]. Other studies look at other important factors, such as government

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© 2024 Puspita et al. This is an open-access article distributed under the terms of the Creative Commons Attribution (CC BY) license, allowing unrestricted use, distribution, and reproduction in any medium, provided proper credit is given to the original authors. Think twice before printing this journal paper. Save paper, trees, and Earth! intervention in the relationship between social capital and collective action. They say that government intervention can act as "catalysts" of collective action [12]. The results show that external interventions have a significant catalytic effect on overcoming a lack of trust and promoting formalized collective action, but only under certain circumstances [22]. These studies have yet to focus on the relationship between social capital, government intervention, and collective action. Therefore, this study examined the relationship between these three concepts. This study focuses on social capital, government intervention, and collective action in managing water resources in the Buleleng Regency in Bali.

Method

Study Area

The research was conducted in eight villages (Figure 1) that are members of the Movement "*Atas Nama Air*" Initiative, namely: 1) Panji Village; 2) Panji Anom Village; 3) Sambangan Village; 4) Ambengan Village; 5) Wanagiri Village; 6) Baktiseraga Village; 7) Tegallinggah Village; and 8) Selat Village. Of the eight villages, six had social forestry licenses: Village Forest Management Institutions (LPHD) Bhuana Utama (Panji Village Forest), LPHD Karya Bhakti Pertiwi (Panji Anom Village Forest), Giri Amertha LPHD (Sambangan Village Forest), Pandan Harum's village-owned enterprises BUMDES (Selat Village Forest), Merta Sari Bhuana LPHD (Ambengan Village Forest), and BUMDES Eka Giri Karya Utama (Wanagiri Village Forest). Two other villages, namely Tegallinggah Village and Baktiseraga Village, do not have forests, but ecologically feel the impact of the importance of springs. Research data were collected for six months, July – December 2022).



Figure 1. Unit research maps.

Data Collection Methods

A survey was used as the research method. Data and information collection were carried out using an interview technique and a structured questionnaire. The respondents were randomly selected (simple random sampling). Thirty samples were collected from each KPS and Village is 30 respondents.

Data Analysis

The main concepts in this study are social capital, government intervention (social forestry programs), and collective action. This study's concept of social capital and collective action is based on Uphoff [12]. Social capital includes structural and cognitive forms. Structural categories enable collective action through defined roles and social networks with established procedures and precedents. Based on standard "norms, values, attitudes, and beliefs," cognitive categories can predispose people to collective action [12,23]. The concept of social capital is explained in detail in Section 1). trust, beliefs, norms, and values, and 2). rules and roles; 3. Network [12,24]. Government intervention refers to empowering the government in the community. Empowerment principles [25,26] include equality, participation, independency, and sustainability. Collective action for water conservation in the following form: 1). Preservation and Protection of Water Resources: ensuring that water catchments continue to operate; internal permissions or prohibitions on the use of water sources are used to regulate or prevent the use of water supplies; supplying water from water sources; regulation of sanitary infrastructure, including solid waste management and wastewater management; protection of water sources in connection to land use surrounding water sources and development activities; regulation of land use in the area upstream; defining water source borders; restoring agricultural and forest lands; and maintaining protected forests, nature reserves, and conservation areas. 2). Water preservation: control of surface flow, harvesting rainwater, increasing soil infiltration capacity, and controlling groundwater extraction. 3). Management of water quality: management of household water quality and irrigation Water Quality 4). Water Pollution Control: Wastewater treatment, Placement of appropriate disposal sites, and agricultural waste control.

Measurements were made by scoring each indicator on a scale of 1 to 5, and then the average score was calculated as the level value of each variable (final scoring value 0-1 = Very Low, final scoring value > 1-2 = Low, final scoring value > 2-3 = Fair, final scoring value > 3-4: High, final scoring value > 4-5: Very High). After obtaining the level of variables in each study unit, further analysis was conducted to determine whether there was a relationship and influence between the variables. Path analysis between social capital and collective action with intervening variables (government intervention) was performed using the IBM SPSS Statistics software, version 25.

Result and Discussion

Denbukit Rural Area includes several villages from upstream to downstream in the Buleleng Regency. Several figures initiated inter-village cooperation based on shared awareness of the importance of the ecological benefits of forests, especially the benefits of water for everyday life. Some of these figures are the Village Head, Head of BUMDES, Chair of the LPHD, and Traditional Leaders. This collaboration formed an "*Atas Nama Air*" movement to manage water resources. The joint movement "*Atas Nama Air*" by carrying out various activities is a collective action. The theoretical framework is presented in Figure 2.



Figure 2. Theoretical framework.

Social Capital

Trust, Belief, Norms, and Values

The results showed that the respondents had the following beliefs: 1) forests provide significant benefits for people's lives; forests must exist and be maintained; 2) Existing regulations function effectively to manage forests sustainably and trust other people as members of society can: 1) Maintaining and utilizing water resources for the common good; 2) Understand and comply with applicable water resource management regulations. The respondents' levels of trust and beliefs are shown in Figure 3.



Figure 3. The respondents' level of trust and belief.

Their levels of confidence and trust were relatively high. The proportion of respondents who said they did not believe it was small (< 10 %). The respondents' level of trust and belief is reinforced by the norms that have been adhered to for generations and that contain the values of Balinese life, namely *Tri Hita Karana*, originating from Hinduism. *Tri hita karana* implies a balanced relationship between: 1) Humans with God (*Parahyangan*): make selfless offerings (*punia*) and take a sacred journey (*tirtha yatra*); 2) Humans with other humans (*Pawongan*): Human relationships must be governed by mutual acuity development, compassion, and care, which translates into mutual respect for love; 3) Humans with Nature (*Palemahan*): The environment must always be maintained and not damaged. The background was clean and tidy. The environment should be neither littered nor damaged. Forests cannot be cut down entirely, and animals cannot be hunted at will because they can disturb the balance of nature. The environment must be maintained neat, harmonious, and sustainable. A clean environment creates beauty. The beauty of the environment can create a sense of calm and serenity in humans [27].

Rules and Roles

In village communities that are members of the initiator of the "*Atas Nama Air*" Movement, there are rules that guide the actions of its citizens. The rules described here are limited to managing water resources in the "*Atas Nama Air*" movement. These rules include the following:

Decree of the Buleleng Regent: Decree of the Buleleng Regent Number 414/147/HK/2021 concerning the Denbukit Village Area, Buleleng Regency in 2021, which consists of eight villages: Panji Village, Panji Anom Village, Sambangan Village, Village, Wanagiri Village, Baktiseraga Village, Tegallinggah Village, and Selat Village. This district head's regulation was driven by the initiator of "*Atas Nama Air*" and became the community's foundation for joint water conservation action.

Rules of Perbekel Wanagiri, Ambengan, Sambangan, Panji, Panji Anom, Tegallinggah, Selat, and Perbekel Baktiseraga Number 1 in 2021 concerning Inter-Village Cooperation: This joint regulation establishes an Inter-Village Cooperation Agency (*Badan Kerjasama Antar Desa*/BKAD) with the scope of: a. Protected Forest Conservation in the Area; b. Development of joint ventures owned by village villages to achieve competitive economic value; c. Community Activities, Services, and Development between Villages and d. Field of Community Empowerment.

Awig-a wig: Awig-a wig is a provision that regulates the manner of social life in society to create a stable life order [26]. In general, village awig-awig have regulated ways of life that support water conservation.

Regarding the joint water conservation action, especially the wig-a wig of Wanagiri and Selat Villages, they included activities that support the movement. The respondents' understanding and adherence to rules, values, and norms are shown in Figure 4.



Figure 4. Respondents understanding and adherence to rules, values, and norms.

Figure 4 shows that respondents' understanding of the rules was high. In addition to the high level of knowledge of the respondents, the level of compliance with existing regulations was also relatively high; the group members committed no violations. There are no serious violations because every member of our group holds cultural values that uphold balance with God, the universe, and humans.

Networks

The Den Hill Rural Organization has established general and specific patterns of social networks. A network pattern is built with the local and central governments through coordination and cooperation. The external party that creates a network with the "*Atas Nama Air*" movement is *Bank BRI* in the form of business capital. Of the three indicators above, the level of social capital in each study unit is as shown in Figure 5.



Figure 5. The level of social capital.

Government Intervention

Government intervention in the Den Bukit Rural area was relatively high. The form of intervention assessed in this study was the social forestry program community assistance. The community welcomed the government's intervention because it supported and facilitated joint water conservation activities. In the field, the community felt helped in coordinating and establishing good relations with the regional and central governments; the community felt supported and optimistic in carrying out joint water conservation actions because of the social forestry program. The Level of government intervention are shown in Figure 6.



Figure 6. The Level of government intervention.

Collective Action

Communities in the Den Bukit Rural area collectively engage in water resource conservation activities. Collective action is motivated by a common need for water resources. The development of the population and fulfilment of needs raise conflicts over the control of natural resources. The brutal struggle to meet each other's water needs often creates conflicts that are difficult to resolve. From that point of contention, the thought, "Why not foster cooperation rather than constantly engaging in conflict?" emerged. Water is a "Common Pool Resource" and small units (villages) require more than just water management. Its management requires coordination and joint action across sectors. Based on the above, the community initiated a collective movement, "Atas Nama Air." Some of the initiators include: Gusti Putu Armada (Perbekel Baktiseraga), Putu Mara (Perbekel Selat), dan Made Darsana (Wanagiri Village).

These movements carry out collective water conservation actions to achieve sustainable water use. Water conservation activities include preserving and protecting water resources, water preservation, water quality management, and water pollution control. These activities are indicators of the level of collective action carried out by rural communities in hills. The results show that the level of collective action in the six villages is high and that in the two villages is very high. The level of collective action in each village is shown in Figure 7.





Relation of Social Capital, Government Intervention with Collective Action "Atas Nama Air"

Social capital, government intervention, and collective action levels in the rural community of Den Bukit are relatively high. Do these three variables have a relationship with one another? More specifically, is the collective action carried out by the people of the village of Den Bukit influenced by the community's social capital and government intervention?. The levels of social capital, government intervention, and collective action are shown in Table 1.

Unit	Level		
	Social capital	Government intervention	Collective acttion
Baktiserage Village	4.18	4.17	3.94
Wanagiri Village	4.44	4.29	4.11
Selat Village	4.19	4.21	4.05
Panji Village	4.18	4.20	3.94
Sambangan Village	4.16	4.20	3.55
Panji Anom Village	4.05	4.08	3.50
Ambengan Village	4.07	4.09	3.61
Tegal Linggah Village	4.03	4.02	3.44
Average	4.16	4.16	3.77

 Table 1. The level of social capital, government intervention, collective action.

Community groups with high levels of social capital and government intervention tended to have high levels of collective action. The results of the path analysis using the SPSS application: collective action as the dependent variable (Z), social capital as the independent variable (X), and government intervention as the intervening variable (Y) are presented in Table 2. Based on Table 2, the influence of social capital and government intervention at alpha 0.05, was significantly positive. Similar results were obtained by [20,28]. Many studies agree that social capital leads to collective action [12,14–20,28–32]. The path-analysis model is shown in Figure 8.

Table 2. The result of path analysis.



The relationship between social capital and collective action was significant at an alpha level of 0.05. Through government intervention, the coefficient value of the indirect effect of social capital on collective action was greater than the direct effect. This relationship means that government intervention catalyzed the collective

action "*Atas Nama Air*" in Buleleng, Bali. Previous studies have found that government intervention can weaken, erode, or destroy the existing social capital. Other studies state that government intervention is a catalyst for collective action. Government interventions can create or manipulate social capital [33]. The structure needs to be supported but not fully controlled by the government [34]. Government intervention can increase participation through a social capital approach in the "community development" [35]. Therefore, government intervention through development programs must consider social capital, which aligns with the findings of previous research [11,35–36]. The critical role of the government in driving positive collective action, which has implications for increasing the capacity of natural resource management communities, makes it essential to increase public trust in government [28].

Conclusion

The social capital of the community was included in a reasonably strong category. The level of trust and belief among community members was high. The level of knowledge and compliance of respondents was relatively high. It is strengthened by the Norms and Values inherent in Balinese society. The results of statistical experiments demonstrate that social capital significantly influences collective action. Collective action is significantly influenced by social capital through government intervention. The indirect effect of social capital on collective action through government intervention is greater than the direct effect. Therefore, positive government intervention can be carried out in communities that consciously carry out conservation movements with the strength of community social capital to achieve the sustainable management of natural resources.

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