

A Study of Gender Perspectives on Farmers' Livelihood Resources in a Dryland Farming Community of Lombok Island, Indonesia

ABSTRACT

Aim: A case study on Lombok Island, Indonesia, examined livelihood resources among rain-fed rice farmers from a gender perspective.

Study design: Using a descriptive approach, the study purposely selected dryland and rain-fed farming communities reliant on agriculture.

Place and duration of the study: The study was conducted in the southern part of Lombok Island between December 2023 to January 2024.

Methodology: Data from 30 respondents (15 male, 15 female farmers) assessed livelihood resources across human, natural, financial, social, and physical aspects. Analysis employed categorical techniques and mode calculations.

Results: Male farmers predominated in managing human resources and natural resources such as land and water ownership. Females excelled in household water use, technology adoption, and accessing financial aid. Both genders managed income and savings similarly, with males showing greater agricultural knowledge and communication skills.

Conclusion: These insights underscore the nuanced gender dynamics in resource management and highlight the need for gender-responsive policies to foster sustainable livelihoods in vulnerable dryland communities.

Keywords: Gender perspective, rain-fed farmers, livelihood resources

1. INTRODUCTION

Provide a factual background, clearly defined problem, proposed solution, a brief literature survey and the scope and justification of the work done.] Climate change has resulted in increasing global temperatures, prolonged droughts, and unpredictable rainfall patterns, disrupting the agricultural sector worldwide [1]. These climate impacts have particularly affected Indonesia, where farmers' limited ability to forecast, weather has led to decreased agricultural productivity, heightened risks of crop failure, land degradation, more frequent droughts, increased humidity levels, and intensified plant pest outbreaks [2]. Lombok Island, situated in Indonesia, is particularly vulnerable to climate change impacts. With an area of 4,738.65 km² [3], a significant portion of the island is dedicated to dryland farming, including moorland or gardens covering 235,550 hectares and fields or huma covering 87,946.3 hectares [3]. A substantial proportion of Lombok's population depends on agriculture, with many farmers relying on dryland farming methods [4].

Optimizing use of dryland and rain-fed rice farming can significantly contribute to national food security [5]. Farmers continue to address these challenges by optimizing the use of livelihood resources, including human resources (HR), natural resources (NR), physical resources, social resources, and financial resources [6]. However, access, control, and benefits derived from livelihood resources in the agricultural sector are closely tied to social norms regarding gender

roles [7]. Unequal allocation or distribution often denies equal opportunities between male and female farmers in agricultural development processes due to limitations in access, control, and ownership of resources for one gender. Women often face greater constraints in this regard [7]. Various studies in developing countries reported female farmers encounter numerous challenges in accessing available resources due to societal assumptions that they are less capable in agricultural activities; Most of the significant and influential agricultural resources are typically dominated by male farmers [8];[7];[9].

To support the optimization of livelihood resources, gender mainstreaming in agricultural development is essential [10]. Gender mainstreaming involves ensuring the involvement of both male and female farmers in decision-making processes and addressing agricultural issues [7]. Behavioral differences create gender discrimination and inequality between male and female farmers [11]. Hence, a case study on the allocation of livelihood resources from a gender perspective was conducted in the drylands of Lombok Island, Indonesia, as part of this research. The aim was to understand how male and female rain-fed rice farmers control livelihood resources for farming and their general livelihoods. The findings from this study will inform policymakers and stakeholders in developing more inclusive and equitable adaptation strategies for the impacts of climate change on dryland farmers in Lombok Island, Indonesia.

2. METHODOLOGY

This study employs a descriptive method where each variable is examined independently without comparing one to other variables. The primary unit of analysis consists of individual male and female rain-fed rice farmers on Lombok Island. The study involved interviewing 15 male farmers and 15 female farmers across various age groups. Data collection included primary data through interviews and secondary data from documents. Farmers' livelihood resources are categorized into five main assets, which are human (Human Capital), natural (Natural Capital), financial (Financial Capital), social (Social Capital), and physical (Physical Capital). The data obtained from this research were analysed qualitatively by identifying patterns and dominance in the ownership and utilization of these resources based on gender.

3. RESULTS AND DISCUSSION

3.1 Characteristics of Lombok Island, Indonesia

Lombok Island, situated in West Nusa Tenggara Province, comprises five districts: West Lombok Regency, Central Lombok Regency, North Lombok Regency, and Mataram City. The island spans 4,738.65 km² with significant areas of dry land including moorlands or gardens covering 235,550 hectares and fields or huma covering 87,946.3 hectares [3]. The island's population numbers around 3.7 million people, predominantly Sasak with minority groups including Balinese, Javanese, and others. Population density ranges from 700 to 800 people per km² [4]

Agriculture is the primary occupation for much of Lombok Island's population, totaling 5,378,770 individuals [4]. Most of the island's rice cultivation occurs in rainfed fields dependent on local precipitation. Rainfed lowland rice farming is highly sensitive to regional climate conditions, where weather patterns significantly impact agricultural growth and output. Global climate change has substantial effects on various aspects of life worldwide, including Lombok Island.

Residents of Lombok Island experience the consequences of climate change, including droughts, floods, high temperatures, low temperatures, strong winds, and high humidity in different areas. These climate shifts adversely affect agricultural productivity in regions with

low rainfall throughout the year, such as the Central Lombok Regency, which recorded 1,191 mm of rainfall in 2023 [4]. Insufficient rainfall necessitates reliance on rainwater and groundwater through well drilling to sustain agricultural systems in these areas.

3.2 Respondent's Characteristics

The characteristics of the respondents include several aspects such as age, level of education, number of dependents in the family, training experience, and type of occupation.

3.2.1 Age

According to the Ministry of Health of the Republic of Indonesia (2017), the age of the population is categorized into three groups: the young age group (under 15 years), the productive age group ranging from 15 to 64 years, and the non-productive age group (over 65 years).

Table 1. Characteristics of Respondents Based on Age

No	Age	Frequency			
		Male (person)	(%)	Female (person)	(%)
1	<15	0	0	0	0
2	15-64	14	46,66	11	36,66
3	>64	1	3,33	4	13,33
Total		15	50	15	50

Source: Processed Primary Data 2023

Table 1, indicates that male farmers are predominantly within the productive age range of 15-64 years, totalling 14 individuals at 46.66%. Similarly, female respondents are most frequently found in the 15-64 years age range, comprising 11 individuals at 36.66%. According to [12] farmers in the productive age group are considered capable of generating goods and services, as this age range is crucial for the success of agricultural enterprises. However, farmers aged over 64 years possess significantly more experience and tend to have a better understanding of land types and appropriate land management practices for cultivated or currently worked land [12].

3.2.2 Education

In this study, formal education spans from elementary school through to higher education institutions.

Table 2. Characteristics of Respondents Based on Education Level

No	Education	Frequency			
		Male (person)	(%)	Female (person)	(%)
1	Dropped out	5	16.66	9	30
2	Primary School	2	6.66	3	10

3	Junior High School	0	0	3	10
4	Senior High School	4	13,33	0	0
5	University	4	13,33	0	0
Total		15	50	15	50

Source: Processed Primary Data 2023

The educational disparities highlighted in Table 2 underscore complex social, economic, and cultural dynamics that continue to shape educational outcomes among male and female rice farmers. Table 2 illustrates that the educational attainment among rice farmers, particularly female respondents, remains notably low. Majority of female farmers are classified as either dropouts or graduates of primary school. In contrast, male respondents exhibit a wider range of educational levels, spanning from low (similar to females) to higher levels such as senior high school and university.

The low educational status of female farmers can be attributed to several intertwined factors. Primarily, patriarchal systems historically confined women to domestic roles, hindering their access to education and opportunities outside the household [13]. However, evolving feminist perspectives have gradually opened doors for women to engage more actively in agriculture. Economic pressures also play a significant role, compelling women to contribute extensively to farming activities, thereby limiting their ability to pursue further education due to financial constraints. Moreover, agriculture often operates as a traditional family occupation, encouraging women to fulfill dual roles of contributing to household income while adhering to societal norms.

[14] emphasizes parental prioritization of educating male farmers, often at the expense of their daughters' education. This preference reflects societal norms where women are expected to focus on domestic duties, relegating them to lower educational opportunities [14]. Furthermore, cultural expectations that daughters marry early and move away perpetuate the belief that investing in sons' education will secure the family's economic stability.

3.2.3 Number of Dependents

The term "number of dependents" in this context specifically denotes the count of family members who rely on the farmer respondents for their living expenses. This includes individuals who are employed as well as those who are not yet employed but are still financially dependent on the family. These dependents are part of both male and female farmers' households and are quantified by the number of individuals. As the number of dependents in the family increases, so do the overall household expenditures. This situation necessitates that farmers in response to escalating household needs, must escalate their efforts to secure employment and increase their work hours to adequately provide for their families [15].

Table 3. Characteristic of Respondents Based on Family Dependents

No	Number of Dependents	Frequency			
		Male (person)	%	Female (person)	%
1	1-3	12	40	13	43,33
2	4-6	3	10	2	6,66
3	>6	0	0	0	0
Total		15	50	15	50

Source: Processed Primary Data 2023

Table 3 shows that a significant portion of respondent families (40% of males, 43.33% of females) have 1-3 dependents. Many attribute this to their children marrying early and becoming financially independent by forming their own households.

3.2.4 Farmers' Entrepreneurial Experience

In managing their farming enterprises effectively, farmers' capability can be determined based on their experience or the length of time they have been engaged in their profession [16]. Table 4 below depicts the respondents' farming experience in this study.

Table 4. Rice Farmers' Agricultural Experience among Respondents

No	Year of experience	Frequency			
		Male (person)	%	Female (person)	%
1	<5	0	0	0	0
2	5-10	5	16,66	6	30
3	>10	10	33,33	9	20
Jumlah		15	50	15	50

Source: Processed Primary Data 2023

Table 4 reveals that most respondents are experienced farmers, with males typically having over 10 years and females having 5-10 years of farming experience.

3.3 Farmers' Livelihood Resource Management from a Gender Perspective

3.3.1 Human resources

Human resources serve as both determinants and drivers of other resources, mutually influencing each aspect [17]. This research encompasses several natural resources, including the training attended by rice farmers and the labor required in rainfed paddy farming. Meanwhile, human resources have been delineated in the characteristics of respondents as detailed in Tables 4 to 5. To elaborate further:

3.3.1.1 Conducting Training for Farmers

Training activities for farmers are conducted with the aim of enhancing their knowledge, skills, and attitudes in using agricultural technology and systems more effectively to maximize production outcomes and increase farmers' household income. These training sessions are intended to transform farmers' attitudes towards optimizing the use of available resources and adopting new technologies, thereby saving time and energy.

Table 5. Participation in Training among Rainfed Paddy Farmers

No	Participations	Frequency			
		Male (person)	%	Female (person)	%
1	Never	14	46,66	15	50
2	Sometimes (1-5 times)	1	3,33	0	0
3	Often (>5 times)	0	0	0	0
Jumlah		15	50	15	50

Source: Processed Primary Data 2023

Table 5 shows that most male and female farmers have not attended training due to time constraints from farming duties. Training facilities' distant locations also hinder attendance. Farmers perceive insufficient information and prioritize field work over training sessions.

3.3.1.2 Labor Force in Rainfed Rice Farming

In the agricultural sector, labor can originate from within or outside the family unit [18]. Table 6 details the labor utilization by rainfed rice farmers in Pujut District, Central Lombok Regency.

Table 6. Labor Utilization of Rainfed Rice Farmers

No	Number of labourers	Frequency			
		Male (person)	%	Female (person)	%
1	Dalam Keluarga	13	43.33	14	46.66
2	Luar Keluarga	2	6.66	1	3.33
	Jumlah	15	50	15	50

Source: Processed Primary Data 2023

Table 6 illustrates that intra-family labor is more prevalent among both male and female rice farmers. However, female farmers exhibit a stronger inclination towards intra-family labor compared to their male counterparts, who tend to rely more on external labor for assistance. Specifically:

- a. Male farmers employing intra-family labor account for 13 individuals, constituting 43.33%, whereas female farmers utilizing intra-family labor total 14 individuals, comprising 46.66%.
- b. For external labor, male farmers employ 2 individuals, making up 6.66%, whereas female farmers utilize 1 individual, constituting 3.33%.

According to several informants, using family labor is a cost-effective strategy in agricultural production, as it eliminates wages and other costs associated with hired labor. Family members are readily available and capable of performing tasks without strict time constraints [19]. Female farmers, often constrained by limited land, heavily rely on family support [20]. Despite the dominance of family labor, some farmers require external assistance to expedite tasks and prevent production delays, which could otherwise affect harvest timing and overall productivity [21].

3.3.2 Natural Resources

Natural resources, also known as natural capital, are crucial assets derived from the environment essential for agricultural livelihoods. These resources include land ownership and water sources used for both farming and household needs among farmers [22]. Beyond land and water, natural capital encompasses forests, wildlife, fiber, non-cultivated food, and biodiversity [23]. This study specifically examines key natural resources such as land ownership, household water sources, and rainfed rice farming for paddy cultivation.

3.3.2.1 Land Ownership

Land is a fundamental asset essential for agricultural production and meeting farming needs. It serves as a vital component of household welfare and can act as a secure and profitable investment for farmers [24]. In this study, it was found that male farmers predominantly own agricultural land compared to female farmers. Specifically, 46.67% of male farmers own land, while the percentage for female farmers is 26.67%.

Table 7. Land Ownership of Rainfed and Irrigated Rice Farmers

No	Land ownership	Frequency			
		Male (person)	%	Female (person)	%
1	Yes	14	46.67	8	26.67
2	No	1	3.33	7	23.33
	Total	15	50	15	50

Source: Processed Primary Data 2023

Based on Table 7, male farmers are more likely to own land than female farmers, influenced by societal norms assigning women primarily to household roles. Despite legal equality in land ownership rights. Rural female farmers often face limited access to land ownership.

3.3.2.2 The Water Sources Used In Farmers' Household Activities

Clean water is crucial for household activities like cooking, drinking, and hygiene among farmers. They access water from communal and private drilled wells, dug wells, and local water supply services (PDAM/PAMDES). The specifics of water sources utilized by farmers' households are outlined below:

Table 8. Water Sources in Farmers' Household Activities

No	Sources of water	Frequency			
		Male (person)	%	Female (person)	%
1	Public Drilled Well	3	10	5	16,67
2	Private Drilled Well	5	16,67	2	6,67
3	Private Dug Well	1	3,33	3	10
4	Communal Dug Well	1	3,33	1	3,33
5	Local Water Supply Company/Village Cooperative (PDAM/PAMDES)	5	16,67	4	13,33
	Total	15	50	15	50

Source: Processed Primary Data 2023

Table 8 shows that most male farmers (16.67%) rely on private drilled wells and PDAM/PAMDES for household water, while female farmers (16.67%) predominantly use public drilled wells. PDAM/PAMDES provide reliable clean water but are limited, prompting communities to favor drilled wells, found cost-effective. Farmers collectively share electricity costs for water pumps, ensuring reliable access. Male farmers favor private drilled wells for convenience and less competition. In drought-prone areas, drilled wells ensure sufficient daily water amid scarcity, highlighting their essential role.

3.3.2.3 The water sources used for agricultural activities

In this study, rainfed rice farming obtains water from rainwater, drilled wells, reservoirs, and local water supply companies or village cooperatives (PDAM/PAMDES). Based on Table 9 it is observed that both male and female farmers equally utilize rainwater as the primary source for irrigating rice fields.

Table 9. Water Sources for Rainfed Rice Farming Activities

No	Water source	Frequency			
		Male (person)	%	Female (person)	%
1	Drilled Well	0	0	0	0
2	Rainwater	15	50	15	50
3	Reservoir	0	0	0	0
4	PDAM / PAMDES	0	0	0	0
	Total	15	50	15	50

Source: Processed Primary Data 2023

Farmers in the study commonly plant crops twice annually, but they face challenges with unpredictable weather and irregular rainfall. This situation causes delays in harvests and disrupts production processes. Emphasize that rainfed rice farming, reliant on rainfall, frequently encounters crop failures due to erratic weather patterns, affecting planting schedules significantly in rainfed agriculture.

3.3.3 Financial Capital

This study examines financial resources among rice farmers, encompassing income from farming, initial capital sources, and types of savings. Financial resources include cash, savings, bank loans, and other assets easily converted into funds. Access to such financial capital, as emphasized by [19], plays a crucial role in farmers' ability to plan and sustain their livelihoods through strategic farming practices.

3.3.3.1 Farmers' Income

According to Table 10 the highest income category among male farmers exceeds 2,000,000 IDR, representing 26.67% of respondents. Female farmers predominantly fall within the income range of 1,500,001 - 2,000,000 IDR. Details are as follows:

Table 10. Farmers' Income

No	Amount of income	Frequency			
		Male (person)	%	Female (person)	%
1	0				
2	Rp 1- 500.000				
3	Rp 500.001 – 1.000.000	7	23,33	4	13,33
4	Rp 1.000.001 – 1.500.000			3	10
5	Rp 1.500.001 – 2.000.000			5	16,67
6	>2.000.000	8	26,67	3	13,33

Total	15	50	15	50
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Source: Processed Primary Data 2023

Table 10 reveals a notable income disparity between male and female farmers, with males earning significantly more due to higher yields. Female farmers often earn less, primarily working as agricultural laborers. This aligns with [25] findings that male farmers generally outnumber females. However, Table 10 also indicates variability in income levels among female farmers.

3.3.3.2 Initial Capital Sources for Farmers

In this study, initial capital denotes the financial or material resources necessary to start agricultural ventures. Capital is integral to agricultural systems, encompassing production facilities, seeds, fertilizers, labor, machinery, and technology [26]. Farmers typically acquire initial capital through personal savings, cooperative contributions, loans, and government subsidies. It is crucial for procurement, provision, and replenishment to sustain agricultural operations effectively.

Table 11. Livelihood Funding Sources for Rainfed Rice Farmers

No	Budget	Frequency			
		Male (person)	%	Female (person)	%
1	Personal	13	43,33	8	26,67
2	Cooperative	0	0	0	0
3	Loan	2	6,67	0	0
4	Assistance (NGOs/ Government /neighbors)	0	0	7	23,33
	Total	15	50	15	50

Source: Processed Primary Data 2023

Based on Table 11, 43.33% of male respondents primarily use personal funds as agricultural capital, whereas only 26.67% of female respondents rely on personal funds. Female farmers often resort to neighborly assistance due to their small-scale farming status and limited land, facing challenges accessing formal financial institutions for loans [27]. Gender biases also restrict female farmers' capital management abilities, compounded by dual domestic and public roles, limiting income for household needs.

In contrast, male farmers predominantly use inherited personal capital for farming, benefiting from greater asset ownership and opportunities for non-agricultural employment. This disparity highlights gender differences in capital access and management within agricultural contexts, influencing productivity and livelihood sustainability among farmers.

3.3.3.3 Types of Saving

Savings refers to the act of setting aside money or goods for accumulation either within specific institutions or individually for personal storage. In the agricultural sector, farmers typically save their harvests as long-term savings in various forms, such as money, jewelry, harvested crops, and household items.

Table 12. Types of Savings Used by Rainfed and Irrigated Rice Farmers

No	Types of saving	Frequency			
		Male	%	Female	%

		(person)		(person)	
1	Money				
2	Jewelry				
3	Harvested crops	15	50	5	16,67
4	Household goods			10	33,33
	Total	15	50	15	50

Source: Processed Primary Data 2023

Based on Table 12, majority of male farmers, in fact all (50%), save their harvest yields. Meanwhile, women predominantly choose to save in the form of household goods. Some women also save their harvest yields, but not as many as male farmers. Current savings practices among farmers aim to meet future living needs without selling their entire harvest. Women opt for household goods because they can sell either the rice harvest or household items when they need money.

3.3.4 Social Capital

In this study, social capital support in rainfed rice farming includes information sources related to rice cultivation methods in rainfed agriculture, networks that support agricultural activities or provide capital assistance, and communication among farmers, both in groups and individually.

3.3.4.1 Sources of Rice Cultivation Information

In this study, agricultural information sources come from various sources and can be accessed at any time, such as through extension activities or other means. Table 13 indicates most respondents obtain information regarding rainfed rice farming management from their parents, passed down from generation to generation. Nearly all farmers have indeed been working in the fields since childhood, taught by their parents.

Table 13. Sources of Agricultural Information for Rainfed Rice Farming

No	Sources of Rice Information	Frequency			
		Male (person)	%	Male (person)	%
1	Generational (inherited knowledge)	14	46,67	15	50
2	Groups	0	0	0	0
3	Neighbors	1	3,33	0	0
4	Government/extension agents	0	0	0	0
	Total	15	50	15	50

Source: Processed Primary Data 2023

Both male and female farmers inherit the same information from their parents across generations. Farmers typically pass down traditional farming methods to their children. Traditional farming is considered highly suitable and sustainable to continue because farmers believe that traditional agricultural systems are better at conserving natural resources and avoiding activities perceived as harmful to the environment. This data indicates that the information sources used by farmers are still limited in diversity. This underscores the importance of future extension activities to ensure farmers receive adequate information to enhance their agricultural production.

3.3.4.2 Assistance for Rice Cultivation Capital

Financial aid can be obtained through government grants or loans from people's credit banks. Table 14 below provides information on male and female farmers who have received assistance from governmental institutions to support their rainfed rice farming enterprises.

Table 14. Rice Farmers Receiving Assistance from Institutions/Government

	No Assistance	Frequency			
		Male (person)	%	Male (person)	%
1	Received assistance	0	0	7	23,33
2	Did not receive assistance	15	50	8	26,67
Total		15	50	15	50

Source: Processed Primary Data 2023

Based on Table 14 all male rice farmers in this study stated that they have never received assistance from institutions/government for their farming activities. In contrast, many female farmers received assistance from institutions/government (23.33%). The reason female farmers receive assistance is perceived to be their greater contribution compared to male farmers. This finding reinforces the argument by [28] that female farmers are considered more diligent and trustworthy, making them the primary target for various forms of assistance. Additionally, it is believed that the welfare of farmers can be achieved through effective agricultural management carried out by female farmers [28].

3.3.4.3 Intensity of Communication Among Rice Farmers

The communication intensity in this study refers to how frequently farmers interact with each other regarding their farming activities. In this research, all farmers, both men and women, engage in frequent communication among themselves. This communication serves as part of their social interactions within their village community. It encompasses not only sharing information but also addressing various daily life matters.

3.3.5 Physical Capital

The physical resources referred to ownership of transportation vehicles, agricultural machinery, communication devices, and access to the internet. Here are some forms of physical capital being examined:

3.3.5.1 Ownership Of Means Of Transportation

Transportation in this study encompasses tools used for both agricultural and non-agricultural mobility purposes. Table 15 below details the number of transportation assets owned by each farmer, including both male and female farmers.

Table 15. Ownership of Means of Transportation by Rainfed Rice Farmers

No	Frequency
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	Number of means of transportation	Male (person)	%	Male (person)	%
1	0	2	6,67	7	23,33
2	1	7	23,33	5	16,67
3	2	4	13,33	1	3,33
4	3	2	3,33	1	3,33
5	4	0	0	1	3,33
6	5	0	0	0	0
Total		15	50	15	50

Source: Processed Primary Data 2023

Table 15 indicates male farmers predominantly own transportation assets, influenced by societal norms attributing physically demanding tasks to men. These assets are crucial for tasks like transporting harvests and purchasing agricultural supplies. In contrast, female farmers, often engaged in household chores, typically choose to walk to fields due to time constraints and to avoid additional fuel expenses associated with transportation use.

3.3.5.2 Ownership of Communication Equipment

Mobile phones are widely embraced for their convenience in communication across different locations [29]. In this study, female farmers exhibit higher ownership of communication tools compared to male farmers. These tools play a crucial role in accessing agricultural information, education, and entertainment. Female farmers find communication tools, including mobile phones, easier to use, facilitating their engagement with agricultural updates. Conversely, male farmers prioritize fieldwork over communication device usage. This disparity underscores gender differences in technology adoption within farming communities, highlighting how access to and utilization of communication tools can influence information access and productivity among farmers.

4. CONCLUSION

Mobile phones are pivotal for communication [29] with female farmers in this study owning more communication tools than males. These tools enable access to agricultural information, education, and entertainment. Females find these tools, including mobile phones, easier to use, enhancing their engagement with agricultural updates. In contrast, male farmers prioritize fieldwork over using communication devices. This gender gap in technology adoption underscores its impact on information access and productivity among farmers.

CONSENT (WHEREVER APPLICABLE)

Data were collected with respondents' consent; they signed agreements for interviews and recordings. The analyzed data are reported in this research paper. The authors are keeping the consent forms.

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