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PERCEPTION OF AGRICULTURAL PROFESSIONALS OF NAVSARI AGRICULTURAL UNIVERSITY ABOUT NATURAL FARMING

P. B. Khodifad[1], Mallapalli Kavya[2] and O. P. Sharma[3]

1 Associate Professor, Department of Agricultural Extension and Communication, N. M. College Of Agriculture, Navsari Agricultural University Navsari – 396 450
2 Post Graduate Student, Department of Agricultural Extension and Communication, N. M. College of Agriculture, NAU, Navsari - 396 445
3 Professor and Head, Department of Agricultural Extension and Communication, N. M. College Of Agriculture, Navsari Agricultural University Navsari – 396 450
Email : pbkhodifad@nau.in

ABSTRACT

In the realm of agriculture, the concept of natural farming has emerged as a compelling alternative to conventional practices, promising sustainable solutions and environmental harmony. However, amidst this burgeoning interest, understanding the perceptions of agricultural professionals towards natural farming becomes paramount. This article delves into the intricate tapestry of opinions, attitudes, and insights held by agricultural experts regarding natural farming methodologies. From seasoned agronomists to agricultural scientists and extension workers, the perspectives of these professionals provide invaluable insights into the adoption, challenges, and potential of natural farming practices. By elucidating their perceptions, we aim to navigate the complexities surrounding natural farming, uncovering key drivers, barriers, and opportunities shaping its integration into mainstream agricultural landscapes. Through qualitative analysis and empirical evidence, this article endeavours to offer a nuanced portrayal of the attitudes prevailing within the agricultural community towards natural farming. By synthesizing diverse viewpoints and experiences, we aspire to foster constructive dialogue, facilitate informed decision-making, and propel the trajectory of natural farming towards a more sustainable and resilient agricultural future.

Keywords: *natural farming, perception, agricultural professionals*

INTRODUCTION

Modern agriculture, characterized by high input use, heavy mechanization, and non-eco-friendly practices, has boosted production and income for farmers (Gamit and Vinaya, 2022). However, rising costs of inputs and labor, along with expenses for preserving natural resources, have reduced farmers' real income (Rana and Patel, 2022; Padma et al., 2022). The economic strain and low agricultural output have led to severe distress among farming communities, resulting in widespread issues, including farmer suicides across the country.

Natural farming offers a potential solution to these challenges. This sustainable farming method focuses on minimal use of synthetic inputs, integrating crops, trees, and livestock with functional biodiversity. It provides benefits such as improved nutritional security, reduced farmer distress, and mitigation of health risks linked to pesticide and fertilizer residues. Natural farming also addresses broader environmental concerns, including climate change and global warming, by promoting an eco-friendly approach to agriculture. In India, where natural farming is increasingly recognized for its environmental and economic benefits, both the central and state governments have initiated programs to promote it. As a system that aligns with sustainable goals, natural farming can create rural employment and curb the migration of rural youth to urban areas.

This study explores the perception of agricultural professionals at Navsari Agricultural University (NAU) in Gujarat regarding natural farming. Given the university's role in influencing regional agricultural practices, the insights of its professionals are crucial for promoting sustainable farming practices. By examining their views on the principles, benefits, and challenges of natural farming, this research aims to inform policies and strategies to support its adoption. Understanding professionals' attitudes will aid in addressing knowledge gaps, reducing resistance, and ultimately encouraging broader acceptance of natural farming practices. Keeping this in view, a study entitled "Perception of Agricultural professionals of Navsari Agricultural University about Natural Farming" was undertaken with the following specific objectives:

OBJECTIVES

(1) To study the profile of agricultural professionals of Navsari Agricultural University

(2) To study the extent of perception of agricultural professionals of Navsari Agricultural University towards natural farming

(3) To ascertain relationship between the profile of agricultural professionals of Navsari Agricultural University and their perception towards natural farming

METHODOLOGY

A study was undertaken at Navsari Agricultural University (NAU) with an aim to investigate the perception of agricultural Professionals about Natural Farming. All agricultural professionals were considered as population of the study. A sample of 150 agricultural professionals was drawn by employing a proportional stratified random sampling technique. There were three strata; Professor and its equivalent, Associate Professor and its equivalent and Assistant Professor and its equivalent. The sample comprised of 10 Professors and its equivalent, 32 Associate Professors and its equivalent and 108 Assistant Professors and its equivalent. Perception of agricultural professions about natural farming and influence of different factors on it happened prior to the study.*so, ex-post-facto* research design was used for the study. Data necessary for the study were collected through a questionnaire specially prepared covering the scale of each variable. Collected data was processed and analyzed by employing the statistical tools *viz;* frequency, percentage, rank, mean, standard deviation, correlation, t-test, regression and path analysis.

RESULTS AND DISCUSSION

Profile of Agricultural Professionals of Navsari Agricultural University

(1) Age

Based on age, respondents were divided into three age groups: young (up to 40 years), middle-aged (41-50 years), and old (above 50 years). Table 1(1) show that 42.67% of respondents were in the young age group, 37.33% in the middle-aged group, and 20% in the old age group. Most agricultural professionals were young to middle-aged. This may be due to the retirement of older professionals and the recruitment of many young professionals by NAU over the last decade. This finding is supported by the findings of Ali *et al*. (2020), Khan et al. (2021), Alotaibi *et al.* (2021).

(2) Education level

In the present study, respondents' education levels were assessed using a structured scale, scoring 1 for postgraduate and 2 for doctorate. Based on these scores, respondents were grouped into two categories: Post Graduate and Doctorate. The results, shown in table 1(2), revealed that 85.33% of the respondents held a doctorate degree, while 14.67% had a postgraduate degree. This indicates that most agricultural professionals had doctorate-level education, likely due to NAU's recruitment and promotion policies aligned with UGC and ICAR guidelines. These guidelines require a Ph.D. for Associate Professors and M.Sc. with National Eligibility Test (NET) for Assistant Professors. NAU also offered in-service education for faculty without doctorate degrees, further contributing to the high number of doctorate holders. This finding is in line with the findings of Khan et al. (2021) and Malek-Saeidi *et al*. (2012) but in contrast to the results of Patel, et al. (2022).

(3) Gender

Information about the gender of the respondents was collected through a questionnaire. Based on their gender, respondents were categorized into two groups: male and female. A score of 1 was assigned to male respondents and 2 to female respondents. The frequencies of each score were calculated and categorized. Table 1(3) shows that the majority (81.33%) of respondents were male, while only 18.67% were female. This is because, prior to 2005, girls were less likely to be admitted into agricultural education. Additionally, many female students opted out of postgraduate studies due to social issues. These findings align with those of Khan et al. (2021).

(4) Area of specialisation

A questionnaire collected respondents' areas of specialization, scoring them as follows: 1 for social sciences, 2 for basic sciences, 3 for forestry, 4 for agricultural engineering, 5 for horticulture, 6 for plant protection, 7 for natural resource management, 8 for crop improvement, and 9 for animal husbandry. Data of table 1(4) show that 26% specialized in horticulture, 16.67% in plant protection, 15.33% in social science, and 14% in natural resource management. The remaining respondents were in forestry (9.33%), crop improvement (8.67%), basic science (5.33%), agricultural engineering (3.33%), and animal husbandry (1.33%). NAU houses a horticulture college with departments in fruit science, vegetable, floriculture, and post-harvest technology, along with multiple research stations, agriculture colleges, and a polytechnic school. This finding was in line with the findings of Alotaibi *et al.* (2021).

Table 1: Profile of Agricultural Professionals of Navsari Agricultural University (n=150)

Sr. No.	Categories	Frequency	Percentage
1. Age			
(a)	Young age (below 40 years)	64	42.67
(b)	Middle age (41-50 years)	56	37.33
(c)	Old age (above 50 years)	30	20.00
2. Level of education			
(a)	Post Graduate	22	14.67
(b)	Doctorate	128	85.33
3. Gender			
(a)	Male	122	81.33
(b)	Female	28	18.67
4. Area of specialization			
(a)	Social Science	23	15.33
(b)	Basic Science	08	05.33
(c)	Forestry	14	09.33
(d)	Agricultural Engineering	05	03.33
(e)	Horticulture	39	26.00
(f)	Plant Protection	25	16.67
(g)	Natural Resource Management	21	14.00
(h)	Crop Improvement	13	08.67
(i)	Animal Husbandry	02	01.33
5. Professional experience	(Mean = 14.927, SD = 7.544)		
(a)	Low professional experience(up to 2.52)	18	12.00
(b)	Medium professional experience (2.53-7.01)	100	66.67
(c)	High professional experience (above 7.01)	32	21.33
6. Membership in professional body			
(a)	Low professional membership (<6)	17	11.33
(b)	Medium professional membership (7-10)	121	80.67
(c)	High professional membership (>10)	12	08.00
7. Attitude toward the environment	(Mean = 28.74, SD = 3.801)		
(a)	Low level of attitude (up to 24.94)	15	10.00
(b)	Medium level of attitude (24.95 – 32.54)	115	76.67
(c)	High level of attitude (above 32.54)	20	13.33
8. Attendance at environment-friendly farming programmes	(Mean = 12.64, SD =10.41)		
(a)	Low level of attendance (up to 2.22)	30	20.00
(b)	Medium level of attendance (2.23 – 23.05)	94	62.67
(c)	High level of attendance (above 23.05)	26	17.33
9. Scientific orientation	(Mean = 24.113, SD = 3.161)		
(a)	Low scientific orientation (up to 20.70)	16	10.67
(b)	Medium scientific orientation (20.71-27.51)	111	79.33
(c)	High scientific orientation (above 27.51)	15	10.00
10.. Fatalism	(Mean = 11.467, SD = 2.068)		
(a)	Low level of fatalism (up to 9.38)	24	16.00
(b)	Medium level of fatalism (9.39-13.53)	111	74.00
(c)	High level of fatalism (above 13.53)	15	10.00
11. Mass media exposure	(Mean = 14.46, SD = 4.094)		
(a)	Low mass media exposure (up to 10.37)	24	16.00
(b)	Medium mass media exposure (10.38-18.55)	92	61.33
(c)	High mass media exposure (above18.55)	34	22.67

(5) Professional experience

Data regarding professional experience were collected from the respondents through the questionnaire. On the basis of data, respondents were grouped into low, medium and high professional experience using mean and standard deviation. Results pertaining to the professional experience of respondents are given in table 1 (5) shown that nearly two-thirds (66.67 %) of the respondents had a medium level, followed by 21.33 and 12.00 per cent of the respondents had high and low levels of professional experience. This might be due to that agricultural professionals working in NAU were recruited many years ago. Moreover, because of the good work environment, the majority of the employees do not prefer to leave the NAU till the date of retirement. This finding is line with the findings of Malkanthi (2022), Khan et al. (2021), Patel, et al. (2022) and Ali *et al.* (2020).

(6) Membership in professional body

Extent of Membership in professional body was measured in terms the number of professional societies/ associations in which the respondent had membership. Based on their Extent of membership they were categorized arbitrarily into low, medium and high levels of membership of professional bodies. The data are presented in table 1 (6) shows that the majority (80.67%) had medium membership, 11.33% had low, and 8.00% had high. The prevalence of medium-level membership may be due to recruitment and promotion norms of NAU, which emphasize membership and participation in professional bodies. Agricultural professionals often engage in capacity-building programs, seminars, workshops, and conferences, as well as subscribe to professional bodies for publishing research papers, further supporting their career advancement.

(7) Attitude toward Environment

The respondents' attitudes toward the environment were measured using a structured five-point continuum scale. Based on these scores, they were categorized into low, medium, or high environmental attitudes using the mean and standard deviation. The data, presented in Table 1 (7), shows that over three-fourths (76.67%) of respondents had a medium attitude, followed by 10.00% with a low attitude and 13.00% with a high attitude. The predominance of medium attitudes may be due to growing health awareness; respondents may perceive that protecting the environment brings health benefits, including soil conservation, reduced plastic use, and recycling of organic waste, all of which positively impact the environment. This finding is in line with the findings of Malek-Saeidi *et al.* (2012).

(8) Attendance of Capacity Building on Environment-friendly Farming Programme

Information on attendance in environment-friendly programs, such as capacity-building sessions, seminars, symposiums, and conferences, was collected from respondents. Based on their scores, respondents were categorized into low, medium, and high attendance levels using the mean and standard deviation. Table 1 (8) shows that over half (62.67%) of respondents had a medium level of attendance, followed by 20% with low attendance and 17.33% with high attendance. These results suggest a medium level of participation in environment-friendly programs, likely due to NAU's frequent organization of such activities. Furthermore, participation in these programs is considered in NAU's recruitment and promotion processes, motivating respondents to attend similar events organized by other institutions as well.

(9) Scientific Orientation

The scientific orientation of respondents was measured using a scale developed by Supe (1969) on a five-point continuum. Each respondent's score was calculated, and based on these scores, they were categorized into low, medium, and high scientific orientation using the mean and standard deviation. Data on this variable, shown in Table 1(9), reveal that nearly three-fourths (79.33%) of agricultural professionals had a medium level of scientific orientation, followed by 10.67% with a low level and 10.00% with a high level. It can be concluded that most respondents had a medium level of scientific orientation, likely due to the availability of advanced technologies developed by scientists and widely adopted within the farming community for societal benefit. This finding aligns with the findings of Yedida *et al.* (2020) and Amareliya (2020).

(10) Fatalism

The fatalism of the respondents was measured with the help of a structured scale. The response of the respondents about fatalism was collected through a questionnaire. The score of each respondent was calculated and based on the total score obtained by the respondents they were categorized into low, medium and high levels of fatalism using mean and standard deviation. The data are depicted in table 1 (10) appeared that more than half (74.00 %) of the respondents had a medium level of fatalism, followed by low (16.00 %) and high (10.00 %) levels of fatalism. Result might be concluded that more than half of the respondents had moderate fatalism. From the above findings, it was obvious that respondents had believed in fate, destiny and support from their community with predetermined power and will. The finding is in line with the findings of Tanwar (2021).

(11) Mass Media Exposure

For measuring mass media exposure, Nirban's (2004) scale was used, with responses collected on a four-point continuum. Based on these scores, respondents were categorized into low, medium, and high exposure levels using the mean and standard deviation. Table 1 (11) shows that more than half (61.33%) of the agricultural professionals had a medium level of mass media exposure, followed by high (22.67%) and low (16.00%) levels. This indicates that most agricultural professionals had a positive attitude towards using various media—such as the Internet, newspapers, scientific magazines, extension periodicals, journals, TV, and Kisan Melas—to regularly obtain information on agriculture and related sciences, helping bridge any technological gaps. Similar results were reported by Ali *et al.* (2020) and Khan et al. (2021).

Extent of Perception of Agricultural Professionals NAU about Natural Farming

Table 2: Distribution of respondents according to their perception about natural farming (n=150)

Sr. No.	Categories	Frequency	Percent
1.	Low level of perception (up to 62.95)	27	18.00
2.	Medium level of perception (62.96-80.25)	94	62.67
3.	High level of perception (above 80.25)	29	19.33

(Mean = 68.713, SD = 11.728)

In this study, respondents' perceptions were measured using a structured scale developed with input from the Student Advisory Committee and experts in agricultural extension. Based on their scores, respondents were categorized into three groups: low, medium, and high perception of natural farming, using mean and standard deviation. Data from Table 2 show that the majority of agricultural professionals (62.67%) had a medium level of perception about natural farming, followed by 19.33% with a high level and 18.00% with a low level. This suggests that agricultural professionals generally have a medium level of perception about natural farming, likely due to its relative novelty and limited public information. With limited knowledge, perception may remain low; however, professionals in research, extension, and teaching recognize the harmful effects of conventional chemical farming, potentially leading to a medium to high perception of natural farming.

Relationship between the Profiles of Agricultural Professionals of NAU and Their Perception towards Natural Farming

(1) Correlation

The relationship between the profiles of agricultural professional of NAU was analyzed using independent variables: age, education, gender, area of specialization, professional experience, membership in professional bodies, attitude toward the environment, participation in environment-friendly farming programs, scientific orientation, fatalism, and mass media exposure and perception of natural farming, was measured using Pearson's correlation coefficient (r), with significance tested by the t-test.

Table 3: Relationship between dependent variable and independent variables

Sr. No.	Independent variables	'r' value
X_1	Age	0.190^{*}
X_2	Education	-0.046^{NS}
X_3	Gender	0.032^{NS}
X_4	Area of specialization	-0.038^{NS}
X_5	Professional experience	0.187^{*}
X_6	Membership in the professional bodies	0.105^{NS}
X_7	Attitude toward environment	0.354^{**}
X_8	Attendance in environment-friendly programmes	-0.022^{NS}
X_9	Scientific orientation	0.202^{*}
X_{10}	Fatalism	0.040^{NS}
X_{11}	Mass media exposure	0.163^{*}

NS=Non-significant *Significant at 0.05 level
**Significant at 0.01 level

Results presented in Table 3 show that perception of natural farming was positively and significantly correlated with attitude toward the environment (r = 0.354), age (r = 0.190), professional experience (r = 0.187), scientific orientation (r = 0.202), and mass media exposure (r = 0.163). This suggests that these factors significantly influenced agricultural professionals' perception of natural farming. Conversely, perception of natural farming showed no significant correlation with education (-0.046), gender (0.032), area of specialization (-0.038), membership in professional bodies (0.105), participation in environment-friendly programs (-0.022) and fatalism (0.040), indicating these factors had no impact on perception.

The strong correlation between perception of natural farming and environmental attitude may stem

from natural farming's eco-friendly practices, which help preserve environmental health. Agricultural professionals, being highly educated, likely understand the importance of the environment for human well-being. Policy makers and development agencies are encouraged to promote positive attitudes toward the environment among agricultural professionals. These findings align with Malek-Saeidi et al. (2012).

The significant correlation between age and perception of natural farming suggests that perceptions improve with age, possibly due to greater knowledge and experience among older professionals. This aligns with Alotaibi et al. (2021).

Similarly, increased professional experience positively impacted perception of natural farming, likely due to professionals gaining knowledge, understanding, and insight into agricultural practices over time. This finding is consistent with Alotaibi et al. (2021) and Sarada and Kumar (2018).

A positive correlation with scientific orientation and mass media exposure may be due to scientifically oriented professionals having greater exposure to critical thinking, imagination, and knowledge, enhancing their understanding of natural farming. The lack of significant relationship with education, gender, area of specialization, professional body membership, attendance at environment-friendly programs, and fatalism could be due to heterogeneity among respondents regarding these variables.

(2) Stepwise Regression Analysis

Extent of variation caused by independent variables on the dependent variable

In this study, the stepwise multiple linear regression method was applied using 11 independent variables—age, education, gender, area of specialization, professional experience, membership in professional bodies, attitude toward the environment, attendance at environment-friendly programs, scientific orientation, fatalism, and mass media exposure—with perception as the dependent variable. The objective was to identify the most significant independent variables for inclusion in the multiple regression model. The data related to the stepwise multiple regression are presented in Table 4.

Table 4 : Stepwise multiple regression analysis of independent variables and perception (n=150)

Sr. No.	Independent variables	Partial regression coefficient (b)	Standard error	Multiple correlation coefficient (R)	Adjusted R^2
1.	(Constant)	27.653	7.969	0.397	0.146
2.	Age (X_1)	0.263**	0.111		
3.	Mass media exposure (X_7)	1.033**	0.225		

**Significant at 1 Percentage level of probability

The data in Table 4 revealed that, of the 11 independent variables, two—age (X1) and mass media exposure (X7)—had a significant effect on agricultural professionals' perceptions of natural farming. Together, these variables accounted for 14.60% of the variation, while 85.40% remained unexplained, as indicated by the adjusted R^2 value for agricultural professionals' perceptions of natural farming.

As a result of stepwise regression analysis, the following model was obtained:

$$Y = a + b_1X_1 + b_7X_7$$

Where, Y= Perception, A = The intercept *i.e.,* 27.653, b_i = Regression coefficient, i = 1, 2..., n, X_1 =Age and X_7 = Attitude toward environment

Therefore, the fitted equation would be as under:

$$Y = 27.653 + (0.263)\ X_1 + (1.033)\ X_7$$

(3) Path Coefficient Analysis: Direct, total indirect and substantial indirect effects of independent variables on the dependent variable

(I) Direct effect

The data presented in Table 5 indicates that attitude toward the environment (0.316) had a maximum direct positive effect on the perception of agricultural professionals about natural farming, followed by age (0.187), scientific orientation (0.137), gender (0.133), mass media exposure (0.067), professional experience (0.04), membership of professional body (0.031), education (0.014), fatalism (0.011). On the other hand, the area of specialization (-0.051) had the highest negative effect on the perception of natural farming, followed by attendance in the environment-friendly farming programme (-0.086). It can be clearly concluded that the independent variable attitude toward the environment exerted the highest positive direct effect on the perception about natural farming, whereas, the area of specialization exhibited the highest negative direct effect on the perception of agricultural professionals about natural farming.

Table 5: Path coefficient showing the direct, total indirect and substantial indirect effects of independent variables on perception about natural farming (n=150)

Sr. No.	Independent variables	Direct effect	Total indirect effect	Substantial indirect effect through	
				(1)	(2)
X_1	Age	0.187^{NS}	0.003	0.03673 (X_5)	0.0098 (X_7)
X_2	Education	0.014^{NS}	-0.06	0.0228 (X_1)	0.0024 (X_6)
X_3	Gender	0.133^{NS}	-0.101	0.01568 (X_8)	0.00433 (X_9)
X_4	Area of specialization	-0.051^{NS}	0.013	0.02094 (X_3)	0.00115 (X_2)
X_5	Professional experience	0.04^{NS}	0.147	0.17095 (X_1)	0.01962 (X_7)
X_6	Membership of the professional body	0.031^{NS}	0.074	0.04496 (X_1)	0.02455 (X_7)
X_7	Attitude toward environment	0.316**	0.038	0.02318 (X_9)	0.01611 (X_{11})
X_8	Attendance of capacity building on environment friendly farming	-0.086^{NS}	0.064	0.03126 (X_1)	0.01894 (X_9)
X_9	Scientific orientation	0.137^{NS}	0.065	0.05355 (X_7)	0.00797 (X_{11})
X_{10}	Fatalism	0.011^{NS}	0.029	0.02622 (X_7)	0.009 (X_9)
X_{11}	Mass media exposure	0.067^{NS}	0.096	0.07591 (X_7)	0.02259 (X_1)

Residual = 0.79554

(II) Total indirect effect

The data presented in Table 5 revealed that a total of 9 variables had a positive indirect effect on the perception of agricultural professionals about natural farming. It can be observed that professional experience (0.147), mass media exposure (0.096), membership of the professional body (0.074), scientific orientation (0.065), attendance of environment-friendly farming programme (0.064), attitude toward environment (0.038), fatalism (0.029) and age (0.003). Conversely, Education (-0.06) exerted a maximum negative effect on the perception of natural farming, followed by gender (-0.101). It can be interpreted that independent variable professional experience had the highest positive indirect effect, whereas, education had the highest negative indirect effect on the perception of agricultural professionals about natural farming.

(II) Substantial indirect effect

The data in Table 5 indicate that out of the 11 variables, six were routed through attitudes toward the environment, five through age, four through scientific orientation, two through mass media exposure, one through education, one through gender, one through professional experience, one through membership in a professional body, and one through attendance at environment-friendly farming programs. Regarding significant indirect effects, professional experience had the highest positive indirect effect on perceptions of natural farming (0.17095) through age, followed by mass media exposure (0.07591) through attitudes toward the environment. The results suggest that attitudes toward the environment had the highest direct, positive, and significant effect (at the 0.01 level) on perceptions of natural farming. This implies that agricultural professionals with a favorable environmental attitude are more likely to recognize the benefits of natural farming.

CONCLUSION

The results show that most agricultural professionals were male, held doctorates, and had moderate levels of scientific orientation, environmental attitudes, professional experience, and mass media exposure. About 40% were young, with a moderate perception of natural farming overall. To foster a positive perception of natural farming, it is recommended to organize extensive training, seminars, workshops, and group discussions aimed at agricultural scientists, extension personnel, and educators at NAU.

Age, professional experience, scientific orientation, and mass media exposure correlated positively and significantly with perceptions of natural farming. Notably, attitudes toward the environment had the strongest positive influence, indicating that younger, experienced, and scientifically oriented professionals exposed to media may hold better perceptions. Characteristics such as education, specialization, gender, professional memberships, and attendance at eco-friendly farming programs were non-significant, likely due to sample homogeneity.

Stepwise regression identified age and mass media exposure as the two significant factors affecting perceptions,

while other influences were indirect or unexplained by the variables studied.

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CONFLICT OF INTREST

All authors express no conflict of interest in any part of the research

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