

ASSESSMENT OF MULTIDIMENSIONAL POVERTY AMONG SMALLHOLDER POULTRY FARMING HOUSEHOLDS IN OSUN STATE, NIGERIA

¹Fakayode Olakunle N. and ²Akinrinola Olumide O.

¹Department of Agricultural Technology, Faculty of Pure and Applied Science
Osun State College of Technology, Esa-Oke.

²Department of Agricultural and Resource Economics, School of Agriculture and
Agricultural Technology,
Federal University of Technology, Akure
Corresponding Author's email: *crmgate@gmail.com*

ABSTRACT

This study analyzed poverty among smallholder poultry farmers in selected local government areas of Osun state using a multidimensional poverty approach. A total of 109 respondents were selected randomly from three local governments. Primary data were collected from a well-structured questionnaire and were analyzed using Descriptive statistics, Multi-dimensional Poverty Index, and Probit regression model. Findings revealed that the mean farming experience was 21.3 years and the mean poultry size was 261 birds. The mean value of income was = ₦421,167. The findings revealed that 48.3% of the poultry farmers were poor in the education dimension, 28.3% were poor in the consumption dimension and 45.0% were poor in the dimension of standard of living. According to the findings, 36% of the respondents are far away from the poverty line and 15% experienced poverty in all indicators of poverty dimensions in the study areas. Probit model estimation of determinants of poverty dimensions indicated that education (-5.14), poultry size (-0.39), access to credit (-3.75), membership of social group (-1.5), land ownership (-6.18) and household income (-0.39) revealed a negative relationship but significant effect on the multidimensional poverty status while marital status (2.35) and household size (0.59) have positive relationship and significant effect on multidimensional poverty status in the study area. The study revealed the need for government and intervention agencies to facilitate improvement in education, credit facilities, and the formation of support groups for farmers.

Keywords: *Multi-Dimensions Poverty. Smallholders. Poultry*

INTRODUCTION

Poultry farming is one of the most popular livestock farming options in Nigeria. It is also known as the king of livestock farming in the country. In Nigeria, the most common livestock animals are poultry birds (chicken, turkey, quail, and duck), small ruminants (goats, sheep), pigs, cattle, rabbits, and horses and camels in some parts of the northern region (Agricorp report, 2022). People depend on poultry for protein supply, and it serves as an additional occupation to supplement the income of small and marginal farm families. Poultry occupies an essential position because of its vast potential to bring about rapid economic growth, especially to the weaker section. Oftentimes, poultry production is the target of various poverty alleviation strategies and People generally derive their means of livelihood from poultry and its associated industries (Lawal 2016).

In Nigeria, smallholder poultry farming can easily be characterized by poor management practices, which are inclusive of limited finance for procurement of basic farming equipment, cost of production, access to training, credit facilitation and utilization, poor marketing process, and other factors. In poultry farming, the peculiarities found in the marketing processes, land utilization, production pattern, pricing, credit facilitation, and utilization; underpin the delicate operations as compared to other farming types. Poultry farming does not need a marginal increase in land cultivation to increase production. A better and improved management can increase the yield on the same land without a change in the amount of land available. Despite these submissions, poultry farming is still susceptible to intricacies that can put smallholder poultry farming households into the trap of economic loss resulting in poverty incidences.

Poverty studies in agriculture are ongoing issues with various aspects like poverty headcounts and poverty intensity forming critical points for consideration. In the submission of Omonona (2010), the incidence of poverty (headcount index) is the share of the population whose income or consumption is below the poverty line; that is, the share of the population that cannot afford to buy a basic basket of goods. The difference in the patterns of poverty situations among poultry farming households is a key factor for consideration in understanding the poverty dimensions among farming households. The change in the economic variables within society cannot be said to have the same impact on their production levels. Consequently, the factors of production might be the same for diverse farming households, but the outputs, constraints, markets, training needs and productivity cannot be expected to be the same. Taking this into consideration will expose the differences in poverty situations and dimensions among poultry farming households. It will further establish factors that contribute to poverty dimensions among farming households. The critical challenges facing the issue of escaping and preventing poverty incidence will normally necessitate reviewing various factors that contribute to poverty, especially among rural farmers.

The differences in the poverty dimensions and situations within poultry farming operations have often time, escape the attention of research endeavours. Due to this fact, many of the interventions to reduce poverty incidences have always been using the same blanket approaches to solve the poverty issues among types of farming systems. These blanket approaches do not adequately deal with problems associated with poverty issues peculiar to poultry farming. Therefore, the study intends to bring open, the poverty dimensions among small-holder poultry farming households with a view of providing platforms for policies that will be selective and focused on addressing factors associated with the poverty situation among smallholder poultry farming households. Understanding the poverty dimensions among poultry farming households is an entry point to getting to unravel the factors that contribute to these poverty dimensions.

In the words of Santos and Alkire (2011), poverty has traditionally been measured in one dimension, usually income or consumption. Based on this analysis, a basket of goods and services considered the minimum requirement to live a non-impovertised life is valued at the current prices. People who do not have an income sufficient to cover that basket are deemed poor. They further submitted that the poor people themselves define their poverty much more broadly to include lack of education, health, housing, empowerment, employment, personal security, and more. In other words, no one indicator, such as income, is uniquely able to capture the multiple aspects that contribute to poverty. Hence, the use of multi-dimensional poverty analysis will suffice, to expose various issues that influence the occurrence of poverty among the farmers. The study, therefore;

1. described the socio-economic characteristics of the respondents in the study area,
2. identified the multi-dimensions of poverty among the respondents
3. and examined the factors that contribute to multi-dimensional poverty status among the respondents,

METHODOLOGY

The study was carried out in Iwo, Irewole, and Isokan local Government areas of Osun State of Nigeria because of active livestock and arable farming in the zone. The area lies within latitudes 60 N and 90 N of the equator and longitudes 20301E and 60 E of the Greenwich Meridian. The west border is the Oyo state and on the east is Owu Local Council Development Association. Ayedade Local Government is in the north. The three local government areas comprise mainly the rainforest vegetation belt, with predominantly Yoruba-speaking people and pockets of non-speaking tribes. Agriculture is in the form of small holdings and is the major income-generating activity of the area.

A multistage sampling procedure was used to select the respondents for this study. In the first stage, there was a purposive selection of three (3) local government areas of Osun state: Isokan, Irewole, and Iwo Local Government Areas, because of the concentration of small-holder poultry farming households. In the second stage, the complete list of registered farmers was obtained from the Department of Agriculture and Food Security at the local government offices. In the third stage, forty (40) small-holder Poultry farmers were randomly selected from the list of local government. This gave a total of one hundred and twenty (120) respondents to the study. Out of 120 questionnaires distributed, 109 questionnaires were retrieved and viable for further analyses. The primary data were collected with a set of well-structured questionnaires that were administered to selected small-holder poultry farming households in the study area. Descriptive statistics was used to analyze objective one. Objective two was analyzed using the Poverty Multi-dimension. The unit of analysis for this study is the farming household of the smallholder poultry farmers, represented by the household head.

A household is dimensionally poor if it is deprived of at least one-third of the weighted indicators within the dimension. That is, it suffers more than 33.3% deprivation of the weighted indicators according to Alkire and Vaz (2016) and Alkire and Santos (2011).

The MPI is the product of two components:

- 1) Incidence: the percentage of people who are poor, or the headcount ratio (H)
- 2) Intensity: the average share of dimensions in which poor people are deprived (A)

Thus:

$$MPI = H_0 \times A \dots\dots\dots equation 1$$

Where MPI= Multi-Dimension Poverty Index

H₀= percentage of people who are identified as poor

A= the average share of weighted deprivation

$$H = \frac{q}{n} \dots\dots\dots equation 2$$

q= is the number of poor households in the set and thus, the number of households identified as multi-dimensionally deprived based on the cut-off standard.

n the total number of sampled households under consideration.

The MPI, and any multidimensional poverty measure of its type, requires a deprivation cut-off for each indicator. Usually, the indicators' deprivation cut-offs are noted as, so that person *i* is considered deprived if her achievement in that indicator is below the cut-off, that is, if $X_i < Z_i$

In the MPI the three dimensions were equally weighted so that each of them received a 1/3 weight. The indicators within each dimension were also equally weighted. In the MPI, a person is identified as poor if he or she has a deprivation score higher than or equal to 1/3. In other words, a person's deprivation must be no less than a third of the (weighted) considered indicators to be considered MPI poor.

The probit regression model was used to analyze objective three which examined the factors that influenced multi-dimension poverty among small-holder poultry farming households. Further, the analysis of the mechanism of the probit model measures latent stimuli that can be transformed to the probability range by using cumulative normal distribution as shown below.

$$P \left(Y_i = \frac{1}{x_i} \right) = \frac{\exp(x_i\beta)}{1+\exp(x_i\beta)} \dots\dots\dots equation 3$$

The observed binary (1,0) for a household that is multi-dimensionally poor or otherwise.

This can be further expressed as:

$$Prob. (q_n = 1) = \frac{e^{x_i\beta} + \beta^{x_i\beta}}{1 + e^{x_i\beta} + \beta^{x_i\beta}} \dots\dots\dots equation 4$$

$$q_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + e \dots\dots\dots equation 5$$

Where:

q_i=multidimensional poverty status (1-poor, 0-non-poor)

x_i- vector of the explanatory variable

b=vector of parameters to be estimated

e= error term.

Table 1: The list of explanatory variables and A priori expectation

Explanatory variables	Definition of variables	Unit of Measurement	Expected Sign
Age of the respondent years	The actual age of the head of the household in number	In years	Positive
Gender of the respondent	Sex of the Household Head	Male=1, Female=0	Positive and Negative.
Marital status of the respondent	The marital status of the household head.	Married =1, not married=0	Positive and Negative.
Household size of the respondent	The number of dependents living within a household	In numbers	Positive
household income of the respondent	The Monthly income derived through poultry farming	In Naira	Negative
Farming experience of the respondent	The accumulated year spent on poultry farming	In year	Negative
Access to credit	Ability to access credit from formal credit group and registered social groups	Yes =1, No= 0	Negative
Education	Number years of spent schooling up in formal and government-recognised schools	not educated=1 primary = 1 secondary = 2 tertiary =3	Negative
Poultry size	The number of fowls in a given farm.	Actual numbers of birds	Negative
Land ownership	The ownership of land either by purchased or inherited. The family land is excluded	In hectares	Negative
Membership of social group	Membership of a social group recognised by the government. Examples are farmers' groups, cooperative societies.	Yes=1 N= 0	Negative

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Household Heads

The largest percentage of poultry farmers are within the age range of 41 and 50 years (Table 2). These findings further support the submission of Anderson, Marita, Musiime, and Thiam (2017) on smallholder farming households in Nigeria that, the youngest generation shows the most interest in agriculture and values hard work and achievement.

This finding in Table 2 supports a study on the socio-characteristics of smallholder poultry farmers by Lawal (2016) that 79% percent of smallholder poultry farmers in Nigeria are male farmers. It is a conventional common situation for men to be aggressive in providing for their families, while women are confined to other less strenuous livelihood activities. This might imply why there are more male farmers involved in poultry farming in the study areas. A large percentage of the respondents had a basic form of education. It can be said that a higher educational level, sound knowledge, and efficient management are required of poultry farmers to ensure profitability in the poultry business. The finding is in line with the submission by Okoruwa, Obi-Egbedi, and Adeniran (2015), that many years of schooling is expected to have a positive effect on the adoption of the agricultural program. The mean farming experience of poultry farmers in the study area is 21.3 years. The implication is that poultry farming is being operated by a younger generation of farmers and are gradually growing in their activities. They will be willing to adopt new technology and farming techniques. This result supports that of Oladipo, Fawole, and Akinyemi (2016) that experienced farmers are more productive and willing to embrace new cutting edge in farming.

Table 2 shows that 15% of poultry farmers also have more than six household members. The large household size influences the poverty status of the farmer. The large number of household members will result in more household expenditures on consumption. The majority (60%) of poultry farmers are married. This shows that the family orientation was strong in the study areas. It also implies that poultry farming in the study is mainly practised by married people. This finding is in tandem with the submission of Oladipo *et al* (2016), that poultry farming is majorly practiced by married people. Amos (2006) opined that most backyard poultry farmers were married people who used the proceeds to augment family income and better their living. Most poultry farmers have an income between 400 thousand and 500 thousand. The poultry farmers in the study areas make 1,390 thousand per day. It is suffice to say that, the onset of poverty is likely to be common among the poultry farmers in the study areas. The investment return at the time of this study shows low returns, this is a form of discouragement to investment growth and desire by the farmers to engage in further expansion of their farms.

From this finding, the respondents in the study are smallholder poultry farmers. These small sizes of poultry might be attributed to a lack of funds, sale level, or high mortality rate due to low adoption or the expensive nature of improved management technologies as submitted by Lawal (2016). The smallness of the poultry size in the study areas shows that the financial intensity of operating poultry farming is a major challenge to a smallholding farmer, and this will further prevent their action to mitigate poverty occurrence. Table 2 shows that household headships in the study area were mainly ma-e dominated. It is a common practice in the farming system to have males dominating the farming households.

Table 2: Socio-Economic Characteristics Distribution of the Respondent

Variables	Percentage (%) (n= 109)	Mean
Age (years)		
31 – 40	23.3	46.92
41 – 50	46.7	
51 – 60	23.3	
Above 60	6.7	
Gender		
Male	75	
Female	25	
Educational Level		
No Formal Education	3.3	
Primary Education	15.0	
Adult Education	18.4	
Secondary Education	30.0	
No Formal Education	33.3	
Poultry Size (population of Birds)		
Less 100	10.0	261 Birds
101 – 200	28.4	
201 – 300	50.0	
301 – 400	8.3	
401 and Above	3.3	
Farming Experience (years)		
1 – 10	30.0	21.3years
11 – 20	28.3	
21 – 30	21.7	
31 – 40	18.3	
Above 40	1.7	
House size		
1 – 3	6.7	6
4 – 6	75.0	
7 – 9	15.0	
10 – 12	3.3	
Marital Status		
Single	8.3	
Married	60.0	
Widowed	25.0	
Divorced	6.7	
House Headship		
Male Headship	85.0	
Female Headship	15.0	
Income Group (Naira)		
Below ₦ 200,000	3.3	₦ 421,167
₦ 200,001- ₦300,000	15.0	
₦ 300,001 - ₦400,000	11.7	
₦ 400,001 – ₦500,000	55.0	
Above ₦ 500,000	15.0	

Source: Field Survey 2021

The Estimation of Poverty Profile of the Respondents

The issues of deprivation of standard of living and asset ownership were essential factors contributing to poverty incidence in the study areas. Table 3 shows that 58.3% of poultry farmers were deprived of electricity, which is more than half of the respondents; once there is a lack of electricity supply, the economic growth in the study areas is expected to witness stunted growth (Ukwandu 2018). The highest level of deprivation is the ownership assets around mobility, which is 66.7%. Among the respondents, 35% were deprived of adequate sanitation. Among the respondents, 20% and 8.3% were deprived of basic education and school enrollment. From this finding, there is high school attendance by school-age children in households in the study areas. There is a low deprivation indicator in quality healthcare among the respondents, 5% of poultry farmers were deprived of access to quality healthcare services.

Table 3: The Incidence of Deprivation across Indicators

Indicators	Percentage
Secondary education	20.0
School Age Enrolments	8.3
Electricity	58.3
Potable water	0.0
Adequate sanitation	35.0
House floor	11.7
Kerosene stove	6.7
Car	66.7
Quality health care	5.0
Phone	0.0
Refrigerator	51.7
Radio	46.7
motorbike	31.7

Source: Field Survey 2021

The Multi-dimensions of Poverty of the Respondents

The MPI use two indicators that complement each other within the education dimension: one looks at completed years of schooling of household members, and the other at whether children are attending school. Years of schooling act as a proxy for the level of knowledge and understanding of household members (Alkire and Santos, 2011). In the words of Udoh, *et al* (2017), the years of formal education have great significance on a household's ability to cope with sustainable livelihood capacity. Given the number of years of acquisition of formal education by farmers, it implies that the productive capacity of farmers in terms of skills and knowledge is expected to be high and thus their ability to work and earn income. The knowledge acquired is expected to increase the level of their livelihood sustainability through an increase in income and asset accumulation.

Table 3 revealed that 48.3% of the smallholder poultry farmers are poor in the education dimension. The implication of this is that they spent less on education and quite several school-age children were not enrolled in school. This particular result addressed late school enrolment among the primary school-age children within the households in the study areas. Further in the submission of Alkire and Santos (2011), The MPI considers six indicators for standards of living. It includes three indicators that are related to health and living standards, with access to clean drinking water, access to improved sanitation, and the use of clean cooking fuel. It also includes access to electricity and flooring material. These provide some rudimentary indication of the quality of housing for the household. The final indicator covers the ownership of some consumer goods, television, telephone, bicycles, motorbikes, cars, trucks, and refrigerators. From the results, 45% of smallholder poultry farmers are poor in the dimension of standard of living. This study corroborates the findings of Adeoti (2014), that, the proxies of standard of living were found to be the least contributor to multidimensional poverty in the study of trends and determinants of multidimensional poverty in rural Nigeria. This study revealed the same pattern.

Among the respondents, 28.3% are poor in the dimension of Health. The incidence of child mortality is not high in the study areas and the respondents expended a greater percentage of their household income on food resources. The proximity of the households to adjoining farms presented an opportunity for cheap food supply and protein sources. Oluwatusin *et al* (2019) revealed in their study that farm households were able to consume more food or have access to food due to the cheap supply, farm proximity, and involvement of the farm households in growing their food resources.

Table 4: Poverty Profile across the Dimensions

Dimensions	Status	Percentage
Education	Poor	48.3
	Non-poor	51.7
	Total	100.0
Health	Poor	28.3
	Non-Poor	71.7
	Total	100.0
Standard of living	Poor	45.0
	Non-Poor	55.0
	Total	100.0

Source: Field Survey 2021

Multi-dimensional Poverty Status

Table 5 shows the multidimensional poverty status of the respondents in the study areas. The table shows that 36.7% of the respondents among poultry farming households are experiencing deprivation in more than one identified dimension (education, consumption, and standard of living).

Table 5: Distribution of respondents by multidimensional poverty status (Headcount)

Multidimensional poverty	Percentage
Poor	36.7
Non- poor	63.3
Total	100.0

Source: Field Survey, 2021.

Table 6 reveals the headcount, average poverty gap, and adjusted headcount ratio (MPI). It shows that 36% of the poultry farming households in the study area are far away from the poverty line. An average poultry farming household is poor in 40.5% of the indicators in the dimensions. This is the level of gap between the poverty cut-off line among the respondents and the level of deprivation the poultry farmers are experiencing. It further depicts the depth of poverty among the respondents. In a similar study conducted on poultry farmers in Oyo State by Popoola and Obi-Egbedi (2021), an average poultry farmer was found to be deprived of 47% of the indicators.

Table 6 also shows that 15% of the poultry farming households experienced poverty in all indicators of poverty dimensions in the study area. The adjusted headcount gives a reading of the depth of poverty. This is an estimate of true and absolute poverty experienced by a certain percentage of the people in the study area. These are the farmers that needs urgent interventions to mitigate the harsh effects of poverty. Popoola and Obi-Egbedi (2021), observed the same pattern, where 9% of the poultry farmers studied are deprived in all the dimensions.

Table 6: Multidimensional Poverty Index

Indicators	MPI value
Head Count	0.369
Average Gap	0.405
M ₀ Adjusted Headcount	0.150

Source: Field Survey 2021

Determinants of Multidimensional Poverty among Poultry Farmers

Table 7 indicates factors that contribute to multidimensional poverty among the poultry farming households in the study area. The marital status of the poultry farmers was significant at 5% level and the coefficient is positive. As a married individual, more responsibilities are expected, this is prevalent in Nigerian settings, which can lead to more mouths to be fed and catered for, and invariably lead to poverty. This corroborates the submission of Adesiyani (2015), that, a married farmer gets more responsibilities to vend for with his income thereby leading him to possible poverty.

The household size was significant at 10% and has a direct relationship with multidimensional poverty among the poultry farmers in the study area. The a priori expectation was that if the coefficient of household size is positive, it will cause an additional increase in multidimensional poverty. According to Balogun, Yusuff, and Oloniniyi (2017), an increase in household size can reduce farmers' productivity. This can be attributed to the increase in demand in household expenses and the subsisting income cannot cope with the level of demand, thereby increasing the level of poverty. The household income was found to be significant at 5% and has an inverse relationship with multidimensional poverty among the respondents. It implies that, as the household income increases, there would be a corresponding reduction in household poverty. Any corresponding changes in household income will impact household poverty. According to Kalu and Imoagwu (2022), *small* changes in income distribution can have a very large effect on poverty reduction at the household level.

The coefficient of membership of social groups is negative and it is significant at 1%. In other words, membership in a social group increases social capitals, which provide information that can aid the reduction of poverty. Shiaki *et al* (2023), in their study on the impacts of social capital on poverty reduction in Benue State, found that social capital may reduce poverty based on community trust, social connection, and socioeconomic context.

The significant (5%) and negative coefficient of access to credit indicated that, as poultry farmers have access to credit for their farm operations, there is a reduction in multi-dimension poverty. According to Okoruwa, Obi-Egbedi, and Adeniran (2015), access to credit had a significant relationship and negative coefficient on the poverty status of root and tuber farmers in Southwest Nigeria. The poultry size is significant at 5%. This indicates that additional units to the poultry size will reduce the poverty dimensions among the farmers. The additional increase in poultry size will cause a corresponding increase in the revenue generated from poultry farming. Aladejebi *et al* (2019), in their study on poultry production, posited that the poultry size has a significant effect on the farmer's profit.

The coefficient of land ownership among poultry farmers was found to be significant to poverty dimensions and it has an inverse relationship with poverty dimensions. This indicates that ownership of lands by poultry farmers is a key factor that reduces poverty dimensions. Olutumise *et al* (2023), found land ownership to impact positively on health management practices among poultry farmers in Ondo state.

The educational level of the farmers was found to be significant at 1% and had an inverse relationship with poverty dimensions among the poultry farmers. The implication is that an additional year of education will considerably reduce poverty among the farmers in the study area. This finding corroborates the submission of Omotayo *et al* (2018) that the attainment of an additional year of educational study has the likelihood of reducing household food insecurity and poverty.

Table 7: Probit Analysis of the determinants of poverty dimensions

Variables	parameters	Estimates	Standard Error	p-Value
Constant		-14.663	3.361	0.000
Age	β	-0.022	0.048	0.654
Gender	β_1	-0.478	0.931	0.338
Marital	β_2	2.350	1.795	0.012**
Household size	β_3	0.591	0.271	0.029**
household income	β_4	-0.393	0.002	0.050**
Farming experience	β_5	-0.055	0.034	0.112
Access to credit	β_6	-3.755	0.239	0.036**
Poultry size	β_7	-0.392	0.002	0.019**
Landownership	β_8	-6.184	0.111	0.033**
Membership of Social Groups	β_9	-1.555	0.499	0.069*
Education	β_{10}	-5.144	0.001	0.000***
Pseudo R ²		0.541		
Log Likelihood		38.946		

Source: Field Survey 2021 ***, **, *, indicate Significant at 1%, 5%, and 10% probability level respectively.

CONCLUSION AND RECOMMENDATIONS

Poultry farming in the study area is dominated by males and most of the farmers are in their productive age. The differences in the deprivation show that most of the farmers were deprived mostly of the ownership of assets. The dimension of education was found to be the major area of deprivation among poultry farmers. The probit regression revealed that education, farm size, access to credit, and household income are germane to reducing poverty incidence among poultry farming households across the study areas.

It is therefore recommended that:

1. Farmers should deepen their participation in social groups by forming partnerships and guidelines for designing self-driven poverty alleviation strategies. The influence of social groups can be utilized to train and encourage the farmers on off-farm livelihood activities that generate additional income for the family.

2. There should be involvement of local government areas, Non-Government Organisations, and other agencies in providing training and education through community-based capacity development centers. This will improve existing knowledge on entrepreneurship and livelihood.

3. The federal, state, and local governments should enhance existing credit services to capture poultry farmers who require credit facilities for their farm operations. Local savings and financial institutions should be enhanced to provide credit to poultry farmers for their operations.

1. The extension services and adult education policies should be enhanced to impact the educational level of the farmers. The policy should encourage the importance of school enrolment for household members.
2. The government should partner with agencies and social groups in evolving strategies that will reduce farm input costs for the farmers. The farmers should be supported to form groups to access inputs in bulk as this will spread the cost thereby reducing the expenditures on farm inputs.

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