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Full Length Research Paper

Factors influencing women participation in Women In Agriculture (WIA) Programme of Kaduna State Agricultural Development Project, Nigeria

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The study was conducted to determine women farmers' participation in Women In Agriculture (WIA) programmes. The output and income of women who participated and those who did not participate in the WIA programme were also compared. A multi-stage sampling method was employed to select 272 respondents. Primary data were collected through the use of questionnaires and interview schedule and were subjected to both descriptive and inferential statistics. The mean farming experience was 11. 4years for WIA participants and 9.8 years for non-WIA participants while mean farm size for participants was 1.4ha. and 0.9ha for non-WIA participants. The main source of agricultural information was radio. Regression analysis showed that level of education, age and marital status were significantly related with level of participation. The mean output of WIA participants (688.06kg) was significantly higher than non-WIA participants (139.91kg). The difference in the mean output levels was largely attributed to participation in WIA programme. Calculated Z-statistic value (274.04) for income was significant at 5%. The findings concluded that the difference (₦118,783.69) in the mean income could be attributed to their participation in WIA programmes. Therefore, it was recommended that WIA programmes be sustained and encouraged by Kaduna State Government.

Key words: Women In Agriculture, level of participation, enterprise, farm income, farm output, Agricultural Development Project.

INTRODUCTION

Most farmers in Nigeria (Ogunlela and Mukhtar, 2009) operate at the subsistence (small holder) level in an extensive agricultural system; despite this the country's food security and agricultural development depend on them. Particularly striking is the fact that rural women, take the lead role in agricultural activities, making up to 60-80% of labour force. It is ironical that their contributions to agriculture and rural development are seldom noticed.

In the nine countries observed by Franklin (2007), women's low participation in national and regional policy-making, their invisibility in national statistics and their low participation in extension services suggested that these issues of most concern to women have been neglected in the design and implementation of development policies and programmes. In countries such as Benin Republic, the programmes developed were far from addressing the main concerns of women as they were neither involved in policy making decisions nor were they directly consulted to articulate their needs.

As per Ugboh (2006), agricultural improvement initiative which ignores the impact of women's participation in agricultural development can at best achieve 'false growth'. It is therefore necessary that to be effective, the policies, programmes, projects and targets should address women's specific issues.

About 75% of the poor according to a recent World Bank estimate, lives in rural areas where they draw their livelihood from agricultural and related activities (Kotze,

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2003). Evidently, development, food security and poverty alleviation will not be truly achieved without rapid agricultural growth. Assisting the rural poor to achieve their livelihoods and food security in a sustainable manner is, therefore, a great challenge. Broadly, increase in agricultural productivity is central to growth, income distribution, improved food security and alleviation of poverty in rural Africa (FAO, 2002). In all these, the rural women plays pivotal and crucial roles to the overall success of efforts directed at agricultural development in rural areas.

Women in Agriculture (WIA) programme in Kaduna State Agricultural Development Project is a component of the extension service sub-programme of the Technical services Department. The term 'Women in Agriculture' simply means women in the farming business. This includes cultivation, planting, harvesting, processing farm produce, marketing and livestock keeping. WIA, aims at improving the lot of women farmers in the state by providing information on improved farming techniques and new research findings to the peasant women farmers whose roles have been overlooked for too long. By providing these services a higher production and increased income could be attained (KADP, 1992).

The WIA programme within the existing State Agricultural Development Projects (ADPs), was created in 1990 to address the gender-related deficiencies within the existing extension programme. The programme came about when it became obvious that in spite of a decade of World Bank's assistance in building up Nigeria's extension service, women farmers were still receiving minimal assistance and information from extension agents (Maigida, 1992).

The role played by women farmers in meeting the challenges of agricultural production and development are quite prominent.Their relevance and significance, therefore, cannot be trivialized (Rahman, 2008). Depending on the region, they produce two thirds of the food crops. Afolabi (2008) observed that widespread assumption that men and not women make the key farm management decisions has prevailed. Unfortunately, women farmers in the country are among the voiceless, especially in agricultural policies. Like increasing food production and food security, which underestimates and totally ignore women's role in both production and the general decision-making process within the household.

According to Auta (2004), women in Nigeria produce, process and market about 80% of food, manage 70% of all small scale enterprise and about 33% of all small households which is sustained by women. Their role in agriculture has important implication for development because women constitute a very important segment of the labour needed in production.

Adekanye Otitolaiye and Opaluwa (2009), reported that extension services have often been ineffective in food and agriculture. But the problem is more compounded in the case of women because of the unified extension agricultural system. In this system, men are always the first and perhaps the only target recipient of the planned change in agriculture. Available evidence shows that women still lag behind in terms of extension contact, accessibility to training and other indices of development education for agriculture. Chale (1990) observed that notwithstanding the splendid achievements recorded by WIA, various problems have been encountered, which include shortage of extension agents, as the ratio of extension staff to farm families is still low making it difficult to individually meet all the women farmers. In addition WIA extension workers are not purely agriculture-based.

Although WIA programme has been in existence since 1989, there have been only a few systematic efforts to access its performance. The few studies that were carried out were either outside the researcher's study area or were not on the participation of the women farmers in the WIA programme. Hence, information about women participation in WIA programme in the study area remains scanty. It is for this reason this research was undertaken with the broad objective of analyzing the factors influencing women participation inWIA programme of the Kaduna State Agricultural Development Programme (KADP). The specific objectives of the study were to:

1. Describe the demographic and socio-economic characteristics of WIA and non WIA participants in the study area.
2. Describe the sources of the agricultural information of the women participants and non-participants in WIA programme in the study area.
3. Assess the level of participation of women in WIA programme in the study area.
4. Determine the socio-economic factors influencing womens' level of participation in WIA programme in the study area.
5. Determine the institutional factors influencing womens' level of participation in WIA programme in the study area.
6. Determine the effects of WIA programmes on the output of respondents in the study area.
7. Determine the effects of WIA programme on the income level of respondents in study area.
8. Identify the challenges faced by the participants and nonparticipants in WIA programme in the study area.

METHODOLOGY

The study was conduced in Kaduna state which is located in the North Central part of Nigeria and lies between latitude 9^{o} 10' – latitude 11^{o} 3' North and Longitude 6^{o} – 9^{o} 10' East. It has an estimated total population as at the end of 2010 of 6,210,208, comprising

of 3,139,041 males and 3,071,667 females (NPC, 2006). The total arable land is estimated to be about 2,148,700 hectares. The primary occupation of most households in the state is crop farming. Other major occupations that sizeable proportion of households are involved in include livestock farming and trading (KADP, 2007). The state falls mostly within the Northern Guinea-Savannah zone with an average annual rainfall of 1,482.9 millimeters.

A multi stage sampling method was employed for the selection of respondents. Firstly, two zones out of the four agricultural zones in the State, Birnin Gwari and Lere were purposively selected, representing 50% of the zones. Secondly, from each selected zone, two agricultural extension blocks were randomly selected, representing 40%. The selected blocks were Rigachikun and Saminaka, from Lere zone and Birnin Gwari and Chikun from Birnin Gwari zone. Thirdly, 10% of the number of registered WIA cooperative members or participants were randomly selected from each block to obtain a sample size of 136 respondents. Equal number of non WIA participants were also randomly selected from the same study area to give a total sample size of 272. Data were collected from both primary and secondary sources. The primary data were collected through the use of structured questionnaires and interview schedule with the help of trained enumerators.

Data collected were subjected to both descriptive and inferential statistics. Descriptive statistics was used to achieve objective 1, 2, 3 and 8. Regression analysis was used to achieve objectives 4 and 5 respectively.The Z-test statistic was used to achieve objectives 6 and 7.

The different functional forms of the regression models are explicitly specified as follows:

Linear régression

$Y = \beta_o + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + ……..+ \beta_{11}X_{11} + U$:Equation 1

Double log régression

$\text{Log } Y = \beta_o + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + …..+ \beta_{11} \log X_{11} + U$:Equation 2

Semi log régression

$Y = \beta_o + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + +……..+ \beta_{11} \log X_{11} + U$: Equation 3

Where

Y= Level of Participation of WIA farmers in programmes, measured by the number of programmes involved in.

X_1 = Age of farmer in years

X_2 = Marital Status (Married 3, Divorced/Widow-2, Single 1)

X_3 = Household size (.number of members)

X_4 = Education Level of the farmer (in years)

X_5 = Farming experience (in years)

X_6 = Farm size (in hectares)

X_7 = Access to extension (number of extension visits)

X_8 = Access to land (Yes or No)

X_9 = Access to credit (in Naira)

X_{10} = Membership of cooperative (number of farmers group belong to)

X_{11}= Access to market (Yes or No)

U = Error term

β_o = Constant terms

$\beta_1 – \beta_9$ = Regression coefficients

The formula for calculating Z-test is as indicated below.

The Z-test statistic was used to test the hypotheses of the study.

$$\mathbf{Z}= \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$:Equation 4

Where:

Z = the **Z** statistic calculated value

$\bar{x}_1$= mean income of participants

$\bar{x}_2$= mean income of non participants

S^2_1 = standard deviation of participants

S^2_2 = standard deviation of non participants

n_1 = sample size of participants

n_2 = sample size of non participants

Level of Participation of Women Farmers in WIA programme

This is the involvement of participants in various agricultural activities such as crop production, animal production, produce marketing, food processing and fish farming.

This was measured by the total number of agricultural activities or programmes the participant were engaged in during the farming season under study. Hence one (1) point was allotted to a respondent participating in one (1) programme only, and six points (6) were allotted to the respondents engaged in all six (6) programmes.

Outcomes

Farm output- This is the total quantity of farm produce (e.g. Maize, Sorghum, Rice) animals (e.g. Goat, Sheep, Pig, Cattle), poultry, fishery produced by the farmer under study and ready for market. They were measured in kilogrammes (kg). The livestock components were measure in perceived weight in Kg by the trained enumerators

Farm Income- Defined as the total amount of money realized by the farmer as a result of the sale of farm output. It was measured in naira (₦).

RESULTS AND DISCUSION

Socioeconomic characteristics of respondents

Table 1 shows that majority (41.2%) of respondents were between the age group of 31 to 40 years for participants and about 51.5 % for non participants. Mean age of participants was 39 years while non-participants was 45.9years. Majority of participants (78%) and of non participants (89%) were married. About 71% and 56% of participants and non participants respectively, had one form of education or another. Majority of the participants (67.6%) and only about 27% of non-participants had farming experience of between

Table 1. Distribution of respondents according Socio-economic characteristics.

Variables	Participants	Non Participants
Age (Years)		
20-30	20 (14.7)	2 (1.5)
31-40	56 (41.2)	43 (31.6)
41-50	46 (33.8)	70 (51.5)
51-60	14 (10.3)	17 (12.5)
61-70	0 (0)	4 (2.9)
Mean	**39.0**	**45.9**
Marital Status		
Single	5 (3.67)	0 (0)
Married	106 (77.9)	121 (89.0)
Widowed	17 (12.5)	15 (11.0)
Divorced	8 (5.88)	0 (0)
Household size		
2-4	4 (2.9)	0 (0)
5-7	50 (36.8)	65 (47.8)
8-1	73 (53.7)	71 (52.2)
11-13	9 (6.6)	0 (0)
mean	**8.5**	**7.6**
Level of education		
No. formal education	40 (29.4)	59 (43.4)
Primary education	50 (36.8)	73 (53.7)
Secondary education	14 (10.3)	4 (3.0)
Tertiary education	18 (13.2)	0 (0)
Adult literacy	5 (3.6)	0 (0)
Quranic education	9 (6.7)	0 (0)
Farming experience (Years)		
2-6	17 (12.5)	21 (15.4)
7-11	27 (19.9)	78 (57.4)
12-16	38 (27.9)	33 (24.3)
17-21	54 (39.7)	4 (2.9)
mean	**11.4**	**9.8**
Farm size		
< 1	40 (29.4)	98 (72.1)
1-3	88 (64.7)	38 (24.3)
> 3	8 (5.9)	0 (0)
mean	**1.4**	**0.9**

Figures in parentheses are percentages.

12 to 21 years. The mean farming experience was 11.4-years for participants and 9.8-years for non- participants. About 65% of participants and 24.3% of non-participants cultivated land areas of between 1.0 and 3.0 hectares while approximately 44% of non participants cultivated less than 1 hectare. The mean farm size by participants was 1.4ha. and 0.9ha for non-participants.

Sources of Agricultural information

Table 2 shows that radio was the most important source of agricultural information for both participants (27.7%) and non participants (37.1%). This was followed by contact farmers for participants (24.4%) and television for non-participants (32.1%). The source of Radio as the most popular source of agricultural

Table 2. Distribution of respondents according to major sources of agricultural information.

Sources of information	Participants	Non participants
Radio	134 (27.7)	128 (37.0)
Contact farmers	118 (24.4)	20 (5.8)
Television	101 (20.9)	111 (32.1)
Extension publications	50 (10.3)	4 (1.1)
Extension agents	38 (7.8)	80 (23.1)
Workshops	26 (5.4)	1 (0.3)
Internet	17 (3.5)	2 (0.6)

Figures in parentheses are in percentages.

Table 3. Distribution of participants by their Level of Participation in WIA enterprise.

Number of enterprise participation	Frequency	%
6	39	28.67
4	58	42.65
3	11	8.09
2	28	20.59
Total	**136**	**100**

information among the respondents was in agreement with the findings of Faride and Soetan (1999) who reported that 100% of Oyo women possess radio and obtained their information through radio. Use of radio by the women farmers as the most popular source of agricultural information, all the related information would be made available to them even without electricity, thereby making use of the cheap dry cell batteries as a source of power. The least popular source of agricultural information among the participants and non-participant was the internet selected by 3.5%, and 0.6% respectively.

Level of participation of Women In WIA enterprises

Table 3 shows that 42.7 % of the participants were involved in 4 enterprises, while 28.7% participated in all the 6 enterprises. This implies that about 71% of respondents participated in at least 4 programmes. The result of the data collected also indicated that all participants (100%) cultivated food crops ranging from maize, soyabean, groundnut, sorghum, sweet potato, rice and tomato, while all participants reared one type of animal of the other. These included goats, sheep, cattle and pig. Only about 29% of the participants were engaged in poultry and fish culture and these respondents were mostly regarded as the 'elite' farmers. The participants opined that the cultivation of groundnut and soyabean, served as special savings and a source of capital whichthey usually sell them along with small ruminant animals to raise capital for the next farming season. The reasons according to the respondents were due to their perception that these crops were resistant to attack by storage pests.

Socio-economic factors influencing womens' level of participation in WIA enterprises

Multiple regression analysis of the data indicated in Table 4 that three of the variables were significantly related to level of participation of women farmers in WIA programme. The variables were education, age and marital status. Age and education were significantly related to level of participation at 5% and 1% level of significance respectively. This means that women's womens' age and level of education were significantly related to level of participation in WIA programme. This is plausible because older farmers would tend to stick to farming, reflecting their age-old occupation and would work hard to improve on their output. Any new agricultural programme that would bring this improvement, the farmer like want to be associated with it and would have greater desire to participate in it.

With regards to education level, the negative coefficient (-0.064) implies that as level of education increases, level

Table 4. Multiple Regression Estimates of Socio-Economic and Institutional Determinants of Women level of Participation in WIA Programme.

Variable	Coefficient	Standard error	Significance
Age of farmers	0.033 **	0.009	0.001
Marital status	0.642 **	0.211	0.003
Household size	0.009 NS	0.011	0.413
Level of education	-0.064 *	0.016	0.000
Farming experience	0.013 NS	0.014	0.375
Farm size	0.182 NS	0.186	0.329
Extension contact	0.203 ***	0.107	0.059
Access to land	0.065 NS	0.506	0.897
Access to credit	0.223 NS	0.284	0.434
Membership of cooperative	0.582 NS	0.500	0.247
Access to market	0.133 *	0.025	0.000

* = Significant at 1%
** = Significant at 5%
*** = Significant at 10%
NS = Not Significant

$R^2 = 0.611$
Adjusted $R^2 = 0.566$
F – ratio = 13.57

Table 5. Effects of WIA programme on the Output level of respondents.

Variable	Participant	Non Participant
Sample size	136	136
Mean output	688.07	139.92
Standard deviation of output	621.91	87.96
Mean income (₦)	134,389.04	26,636.32
Standard deviation of output	144164	15605.35

of participation in WIA programme decreases which is expected.. The higher the educational level of the farmer, higher the chances of getting better paying jobs or the higher the tendency to be involved in politics and less increased participation in WIA programmes. In general, this study re-affirms the position of many other studies, including that of Ogunbameru *et al*. (2006) who identified age and educational level as factors affecting women participation in urban agriculture.

The coefficient of marital status was positive and significant at 5% level of significance suggesting that women's marital status influence their level of participation in WIA programmes. . Most of the successful WIA programme participants opined that they have a good understanding, support and encouragement from their husbands in terms of advice and funding. This could have stimulated such farmers to increase their level of participation in WIA programmes. This study is in agreement with that reported by Sabo (2006)which showed significant relationship between marital status and participation in WIA programme in Borno state.

Coefficients of household size, farming experience and farm size were however not significant with level of participation. One possible explanation with regards to household size for this relationship with level of participation might be that most of the participants now discourage the over reliance on family labour on the farm to enable their children have access to formal education. In the case of farming experience, it might be that most of the experienced farmers tend to invest their resources and incomes into other ventures instead of increasing their level of participation in WIA programmes.

Table 6. Distribution of respondents according to challenges facing them.

	Challenges	Participants	Non participants
1.	Discrimination against women farmers in the distribution of farm inputs such as fertilizers.	136 (19.0)	102 (16.2)
2.	Inadequate extension agents	130 (18.2)	42 (6.7)
3.	Inadequate capital	121 (16.9)	114 (18.1)
4.	Lack of adequate storage facilities	117 (16.4)	99 (15.8)
5.	High rate of illiteracy	100 (14.0)	130 (20.7)
6.	Lack of market	60 (8.4)	85 (13.8)
7.	Inadequate land	51 (7.1)	55 (8.7)

*Multiple responses, n > 136. Figures in parentheses are in percentages.

Institutional factors influencing womens' level of participation in WIA programmes

As indicated in Table 4 , the coefficients of extension contact and that of access to market were significant and positive. Access to market was statistically significant at 1% level of significance. This means that the more access to market by the respondents the more their involvement in WIA programme. Informal discussion with participants during the survey, revealed that most of the participants have turned out to be marketers. They bought farm produce from other farmers and carry them to other markets, thus making markets accessible to the participants. Extension contact was significant at 10% level. It was not surprising that extension contact was a good predictor of participation, given the important role being played by contact farmers in the study area under the Training and Visit (T&V) system of extension and the replacement of most male extension agents with females. Similarly, Ogunbameru *et al*. (2006) identified extension contact, access to market, level of education, access to credit, access to land and taking part in decision making as the factors affecting women participation in urban agriculture.

The coefficients of accessibility to land, access to credit and membership of cooperative were however not significant. Possible explanations to these relationships might be. The implication is that they do not influence women participation in WIA probably because they have access to them. As a result of the small sizes of cultivated lands, most respondents were not interested in obtaining credit for farming. In the last resort, they sell off their stored groundnut, soybean and ruminant animals to raise capital for the next farming season, as most respondents opined.

Also, most of the respondents in the study area belonged to at least two cooperative associations. However, it was possible that accessibility to means of production which the participants were expected to get from the managers of the WIA programme was not forth coming. It was also possible that resources and efforts of these cooperative groups were not channelled to agricultural production. This is in agreement with the study of Chikwendu and Arokoyo (1993) who inferred that although majority of the respondents (70.6%) indicated they belonged to "associations", it was clear from the interview that these were mainly socio-cultural and religious groups and not really agricultural production or farm interest based associations or cooperatives that would have a positive input in their farming activities. The coefficient of multiple determinations (R^2) was 0.611. The adjusted R^2 was 0.566, this means that 56.6% of the variations in women's level of participation in WIA programme was due to socio-economic and institutional variables considered in the model. The F-ratio was 13.5 and statistically significant at 1%.

The effects of WIA programme on the women farmers' output and income

The calculated Z-statistic was 10.17 but at 0.05 level of significance, the critical table value of Z is ±1.96. Since the calculated Z-value (10.07) is greater than the Z-critical or Z- tabulated value, it implied that there was significant difference in the mean output level of participants and non participants. Also the estimated mean output of participants was much higher than that of non participants, (688.06 Kg) as against (139.91Kg), as indicated in Table 5. Hence WIA participants declared a higher level of output from their agricultural enterprises than non WIA participants. Hence the impressive difference in the farmers mean output levels were largely attributable to farmers' participation in WIA programme.

The calculated Z-statistic value for income was 274.04 but at 0.05 level of significance, the critical or table value of Z is ±1.96. Since the calculated Z-value (274.04) is greater than Z-tabulated, it implied that there is significant difference in the mean income of participants and non participants. Also the estimated mean income of participants (₦134,389.04) was discovered to be much higher than the estimated mean income of non participants (₦5,605.35). Hence WIA participants had higher mean income from their agricultural enterprises

than non-participants. Therefore findings confirmed that the impressive difference (₦118,783.69) in the mean income of participants from non participants might largely be attributable to their participation in WIA programmes.

Challenges facing WIA and on- participants

Table 6 shows that 19% of the participants indicated that discrimination against women farmers in the distribution of farm inputs such as fertilizers as their major problem. Inadequate extension agents was reported by 18.2% of the participants. Other challenges include inadequate capital (16.9%), lack of adequate storage facilities (16.4%), high rate of illiteracy (14.0%), lack of market (8.4%) and inadequate access to land (7.1%). On the other hand, high rate of illiteracy posed the greatest challenge to the non-participants with 20.7% of them indicating that it was their major problem. Inadequate capital was reported by 18.1%. Challenges faced by non participants include discrimination against women in the distribution of farm inputs such as fertilizers (16.2%), lack of adequate storage facilities (15.8%), lack of market (13.8%) and inadequate land (8.7%).

A Comparison of the result of the participants and non-participants indicated that discrimination against women farmers in the distribution of farm inputs such as fertilizers and inadequate capital were considered to be some of the greatest problems faced by participants in the study area. Similar findings were reported by Ogunbameru *at el*. (2006) who identified factors such as access to credit, land and other agricultural inputs as militating against active participation of women in WIA programme

CONCLUSION AND RECOMMENDATIONS

The study was carried out to determine the level of participation of women in WIA programmes and to compare their performance in terms of output and income levels with those of non-participating farmers.

The age distribution, marital status, household size, farming experience of the two groups of farmers were similar . However, farm size of participants was observed to be generally bigger than those of non-participants. Radio was the the main source of agriculture information or both the participant and non-participants. Contact farmers was the second main source of agricultural information for participant while extension agents was for non-participants.. Regression analysis showed that level of education, age and marital status were significantly related to level of participation at 5% level of significance. Statistical analysis showed that there were significant differences ($p < 0.05$) in the income and output of women farmers who participated in the WIA programme and tbose who did not participate.. Participants had highere output and income l than the non participants .. As a result of the impressive performance by the participants, it was recommended that the WIA programme be retained and encouraged by the Kaduna State Agriculture Development Project with the help and support of Kaduna State Government and possibly the support of the Federal government in line with the Agricultural Transformation Agenda (ATA).

Based on the findings of this study, the following recommendations are hereby made.

1. With the increased confidence that WIA participants have in their contact farmers, more qualified farmers should be indentified selected and trained to act as contact farmers. They should be motivated by extension agents to deliver the extension messages to other women farmers promptly.
2. . Efforts should be intensified to take functional literacy campaign for women farmers to the nooks and corners of rural areas where these women reside in the study area
3. Women in Agriculture programme is operated on cooperative groups/association basis, such groups should be re-organized and targeted in ensuring that necessary inputs such as fertilizers, labour saving devices such as tractor hiring services, credit facilities, good seeds, weedand pest control facilities are channelled to the women farmers directly through their associations.
4. Discrimination against women in the distribution of farm inputs was one of the major challenges facing the women farmers. Therefore there is the need for a paradigm shift – a complete re-orientation in development thought on the importance of gender as an effective instrument for policy formation.

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