CONTRIBUTION OF MASARA N'ARZIKI PROGRAMME IN ALLEVIATING FARMERS` POVERTY IN NORTHERN REGION OF GHANA

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Abstract

Small hold farmers` access to credit and the eradication of poverty among rural dwellers is the focus of many development agencies. Masara N'arziki Programme is an input credit project established in Northern region of Ghana with the aim of reducing rural farmers' poverty. The programme started in 2005 and has received enormous commendations from various international organisations for adopting this strategic of poverty reduction programme in contributing its quota to the poverty reduction agenda. This research therefore assessed the social and economic impact of the programme on participants by analysing primary data collected from both beneficiaries and non-beneficiaries of the programme using questionnaire. The data was analysed using budgeting techniques and multiple regression. The results show a significant difference of GH¢1,551.90 between participants mean gross margin and non-participants mean gross margin. Also, the results reveal a significant impact of the programme on participating farmers' income besides the benefits of increases in the visits by extension agent, farm size, hired labour and fertilizer application. The joint explanation of the variables

presented in the regression model was estimated to be 82.16%. The findings shows that inappropriate time of delivery of inputs, wasting of time in process loan among other were considered to be the weakness of the company. It is recommended that input should be deliver at the right time and at the right quantity based on the farm size.

Keywords

Credit, Farmers, Ghana, Poverty, Participation

1. Introduction

Agricultural sector development is a critical intervention for improving the living standards of people in a country. Development programme targeting the agricultural sector serve as a foundation for economic development. It is undeniable fact that, developing the agricultural sector is the starting point of ensuring economic growth, especially in developing countries. Since agriculture development is critical to Ghana's economic development and the fact that over 52% of Ghanaian households are engaged in agriculture as s source of livelihood who are largely poor farmers in the poverty regions, there is the need to give adequate support to the sector (FAO, 2010). Taking in to consideration the importance of agriculture to the economic development of Ghana, successive governments have made efforts to develop the agricultural sector in order to improve the living standard of the people and alleviate poverty, particularly, in Northern Ghana where Upper West, Upper East and Northern (the three northern regions) are ranked as the poorest, poorer and poor regions respectively. Though various governments have concentrated on using input subsidies as their intervention measure to develop the agricultural sector with little attention to credit for farmers especially, small scale farm holders. According to Diako (2010), insufficient and inappropriate agricultural credit is one of the constraints of agricultural growth in Ghana which is complement by unstable costs of improved inputs and unfavourable output price to farmers. For instance, the cost involve in farm investments in small-scale irrigation have gone beyond the reach of small-scale farmers to pay for them in cash and the credit that could have supported them are not in existence. This make demand for rural credit to be at a high pace especially for agricultural purpose.

Rural farmers are usual in to small scale production characterised by poverty and less access to social and economic infrastructures. In the world, rural small scale farmers are the least capital owners and yet small scale farming is supposed to pave the way in ending poverty in sub-

Saharan Africa as seen by IFAD (2008). To many researchers, there are evidence to show that, efforts by previous governments in Ghana and other private development partners to support small scale farming are not yielding significant and sustainable results as expected by these farmers to alleviate their poverty (MoFA, 2010 and IFAD, 2009). A little opportunity to a small scale farmer in the form of participating in any support project must be a prerequisite to the adoption of a new technology. Alidu et al., (2016) found out that, participation in technology adoption project by rural farmers sustain or has an improvement on the farmers' income after the intervention has ended. Global recommitments and emphasis on agriculture development in developing countries has led to the massive investment in small scale agriculture by both profit and non-profit making organisations, however different results are expected as the involved organisations employed different strategies (World Bank, 2008).

Northern region is an agrarian region with over 60% of the working population employed in the agricultural and related economic activities. Among the farmers, peasants or smallholder farming is the dominant agricultural activity and the people are undernourished and are living in absolute poverty (FAO, 2010). The views that small farms are not viable as the owners do not reap super normal profit and that they are not competitive to more mechanised and capital intensive larger scale farms has proved to be false (IFAD, 2009). This based on the fact that, smallholder farmers have proved to perform significantly well and the organisations operated in small scale farms in the developing world appears to be increasing in their operation rather than falling, although on average, farm sizes continuous decline in large parts of the developing world as a result of erosion. Organisations operating with small scale farmers have adopted new perspective that is traceable to the duration of the 'Green Revolution' where new crop technologies delivered agricultural growth across developing nations. In this new approach, the view is that, smallholder farms can be key drivers for poverty reduction and a remedy to their own challenges (Etwire, 2013). Hence, investments in smallholder farms is relatively advantage in the case of increases in income levels in rural areas and ensuring a trickle down effects to poverty reduction on a sustainable basis. According to Tanko et al, (2015), the frequent and significant changes in the political, economic and social situations in Ghana inversely affects smallholders, but some positively affected. For instance, change in development policies, low investments and reduction in productivity, withdrawal of state support and institutions aiding the development of the smallholder sectors due to change in government are limiting small holder

farmers of becoming the engine of growth that many development partners are expecting them to exist.

Masara N'Arziki programme is a farm based input credit programme operating in the three northern region of Ghana with the sole aim of improving farmers yield, giving capital to farmers and up lifting the living standard of the rural farmers who engaged in small scale production. The programme provides the necessary farm inputs to the farmers as well as ready market after harvesting the farm produced. United States Agency for International Development (USAID) Enabling Agriculture Trade (EAT) programme (2012), affirms that Masara N'Arziki input credit to farmers programme would not only help to reduce the levels of poverty among the rural farmers but indirectly would contribute to improve the food security situation of the rural folks and Ghana at large. Rural areas are characterised by hunger, particularly, northern parts of the Ghana in which most farming households still experience food insecurity for 3-7 months in a year by Nouman et al., (2013). Critical question posed and was demanding an answer was, if Masara N'Arziki programme improve food security and livelihood of the people of Northern region, then what factors determine access to participating in the project? This call for a research by Alidu et al, (2016) in which factors that determine participation in the programme were assessed. However, the gap that is still uncovered and needs empirical finding is the poverty alleviation level.

USAID (2012) among other organisations praised the programme and recommend the strategy employed as a way of reducing poverty in Ghana without providing findings to their claimed. Therefore this research examined the contribution of Masara N'Arziki project in alleviating poverty in Northern region of Ghana and also indicate some of the challenges beneficiaries of the programmed encounter in participating in the programme.

2. Methodology

2.1 Study Area

Masara N'Arziki project aim at helping rural small scale farmers who are largely into maize production. On this basis, the programme is operating in the rural communities. The research was carried out at the Savelugu and Nanton Municipality which shares boundaries in its west with Kumbungu, in the north with West Mamprusi, in the east with Karaga and to the south is the regional capital; Tamale Metropolitan Assembly. The two municipality has 149 communities

with a lot of the communities concentrated at the southern part of the districts. The municipalities has a total land area of about 1,790.70 sq. km in which less that 50% is used for agricultural purposes. By summation, the population of the two municipality is 139,283 comprising of 49.7% male and a female majority of 50.3%. Masara N'Arziki project worked with farmers group and the Municipality has a total of 26 Masara N'Arziki project farmer groups. On average, members in each group is 10 across 24 operational communities in the region. The study concentrate in two of the four districts that beneficiaries of the programme lived. The reason is that, Savelgu and Nanton Municipality has the highest beneficiaries of Masara N'Arizki programme in the Northern region.

2.2. Data Collection and Sampling techniques

Primary data from Masara N'Arizki programme operation area was used in this research. Data was collected using semi-structured questionnaires to give room for amendment of questions. Pre-test as a method of reducing broad answers and unanswered questions was carry out in the study. This also make the assistant researchers to become used to the questions by Ahuja (2007). Simple random sampling approaches and stratified random sampling method were used to select respondents for the study who comprised of participants and non-participant of the programme. 24 communities where Masara N'Arziki is operating was stratified into participants and non-participants' groups and 195 smallholder farmers were selected among the 24 communities of Masara project in the Savelugu-Nanton municipality. 118 beneficiaries were selected and interviewed which was considered as the treatment group and 77 non-beneficiaries were randomly selected and was considered as the control group. Data collected from both the beneficiaries and non-beneficiaries entails; farmers' socio-economic characteristics, quantity of farm inputs received from Masara N'Arziki and applied in the cultivation of crops, cost of farm input, income earned from farm, social and economic impact of the project and the challenges faced in dealing with the company. The data was cross checked, organised and analysed to know the contribution the company makes in alleviating poverty for the past 11 years (from 2005 to 2016) and the constraints beneficiaries encounter. Descriptive statistics such as percentage and frequency were used to analyse the social impact of the project on beneficiaries. Participants' perception of improvement in income and constraints they faced are presented in charts for easy understanding. To indicate empirical evidence of Masara N'Arziki programme impact on poverty reduction, farm budgeting technique was used for the analysis of gross profit margin and

production function analysis (multiple regression) was used to determine factors affecting farmers` income.

Table 1: *Description of Variables of Explanatory Variables*

Variable	Description	Unit of Measurement	A Prior Expectation
Age	Age of a farmer	Years	-
Education	The level of education of a farmer	Years	+/-
Household size	Household size of farmer	Number of household members	+
Extension	No of visit by extension officer	Number of days	+
Project participating	participating in Mansara credit activities	Dummy: yes=1 and Otherwise=0	+/-
Farm size	Total farm size	Hectares	+
Hired labour	Number of men hired	Man hours	+
Agro chemical	Quantity of agro chemical applied	litres	+
fertilizer	Quantity of fertilizer applied	Kg	+
Seedling	Quantity of seedling applied	Kg	+
Marital Status	Marital status of farmer	Dummy: married=1 and Otherwise=0	+/-
Farm Experience	Level of experience of farmer in maize cultivation	Years	+

2.3 Empirical Model

2.3.1 Gross Margin Analysis

Gross margin analysis was adopted in this research as a budgeting measurement approach. Budgeting technique is considered in this research due to the fact that, the fixed capital application in agricultural production, especially small scale rural farming is negligible and according to Kudi (2009), the most appropriate planning tool in situation where fixed capital is insignificant as is the case in subsistence agriculture enterprise is budgeting technique. It is specified as:

$$GM = GFY - TVC \qquad \dots(1)$$

Where:

GM = Gross margin (GH¢ per hectare), GFY=Gross farm income (GH¢ per hectare) and TVC = Total variable cost (GH¢ per hectare)

2.3.2. Production function analysis

Production function is expressed as a relationship between the various levels of inputs needed in the production process and output obtained. In this research the output that is interested to link the input to, is farm income. Many functional form were employed, but the output was not showing the best results. In the trial of Cobb - Douglas production was found to be the most fitted function and this was determined using a combination of criteria which include the probability values of each parameter which determine the level of significance of each coefficient, coefficient of determination of R square, the F-statistic which measures the level of significance of the overall equation and the correct sign of the co-efficient relative to a-priori expectations as set in Table 1. The double log function is specified as:

$$
\begin{aligned}
\log Y = {} & \beta_0 + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + \beta_5 \log X_5 + \beta_6 \log X_6 \\
& + \beta_7 \log X_7 + \beta_8 \log X_8 + \beta_9 \log X_9 + \beta_{10} \log X_{10} + \beta_{11} \log X_{11} + \beta_{12} \log X_{12} + \varepsilon
\end{aligned} \qquad \dots(2)
$$

Where;

Y = Farm income of beneficiaries of MasaraN'Arizki project.

X_1 = Age

X_2 = Education level

X_3 = Household size

X_4 = extension agent

X_5 = Participation in the Mansara credit

X_6 = Farm size

X_7 = Hired labour

X_8 = Agrochemicals

X_9 = Fertilizers

X_{10} =Seedlings

X_{11} =Marital status

X_{12} = Farm experience

Where:

β_0 = constant term

From β_1 to β_{12} are parameters coefficient estimated and ε = Error term.

3. Results and Discussion

3.1. Impact of Masara N'arziki Project on Farmers' Income

Beneficiaries of the project were to indicate the overall benefit (using farm income) by selecting one level for before and after participating in the project and the levels ranged from little and end at great. The Figure 1 indicates that, based on participants perception, there was a great improvement in the farmers' income after their participation in the MasaraN'Arizki programme compared with when they had not participated. From the Figure 1, it is evidence that 83% of the farmers indicates that they had just little improvement in their income before their participation in the programme and 3% of the farmers had little improvement in their farm income after engaging in the programme. Relatively, 14% of the farmers had much increase in their income before participating in the programme and 23% of the beneficiaries had much improvement in their farm income. Only 2% and 1% respectively stated that they had very much and great increase in income before their participation in the MasaraN'Arizki programme and 59% and 15% of the respondents indicated they had very much and great improvement in their income after participating in the programme respectively. Based on the respondents who participated in the programme view, it implies that the MasaraN'Arizki programme had impacted positively on the farmers' income in the Northern region of Ghana.
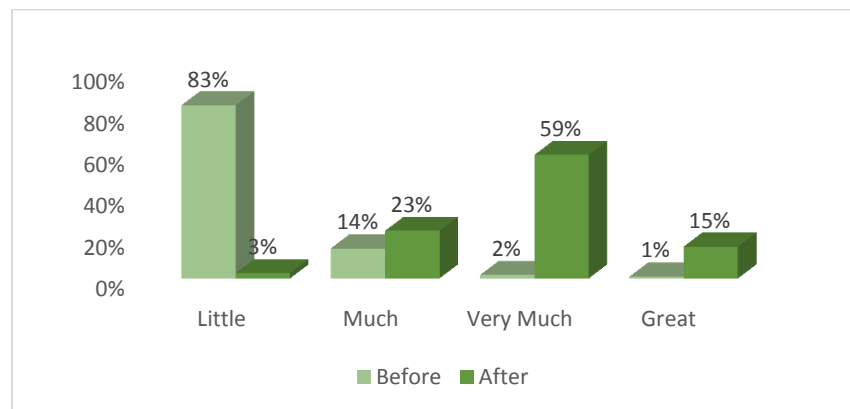
Source: Field Survey, 2016

Figure 1: *Income Improvement of Beneficiaries*

3.1.1 Social impact of Masara N'arziki Project

The research probes further to find out more about the social benefit of the programme. If indeed the farmers` income has improved, what are the social benefits of the programme to the farmers? Again, beneficiaries were asked to indicate the social benefits derived by selecting one or more of the following social benefits in Table 1.2. Because multiple answers were allowed the total responds exceeded the total number of beneficiary respondents. The result in Table 1.2 shows that as a result of an improvement in the farmer's purchasing power due to their participation in the programme, the social benefits from improvement in the revenue derived by the farmers from the farm were; building of houses, acquiring motor bike especially the youth, training their children through formal education, health care through the registration of health insurance and settling of hospital bills, marrying more wives to increase their social status and others such as attending funerals. The result in Table 2 shows that majority of the participants (40.2%) through the programme are able to educate their wards, 21.3% of the beneficiaries used their revenue for health care, 16.6% of the farmers used their income in buying of motor bike as a means of transportation to the farm and to the city, 13.0% used the accrued benefit to build houses as a shelter and 1.8% used the income in marrying more wives. 7.1% stated that they used their income on other social benefits such as on clothing, feeding, performing funerals, celebration of festival, plough-back profit or re-investment in the next farming season and for charity.

Table 2: *Social Impact of Masara N'arziki Programme on Beneficiaries*

Benefits	Frequency	Percentage
Building of Houses	22	13.0
Buying of Motor bike	28	16.6
Educating children	68	40.2
Health care	36	21.3
Marrying	3	1.8
Others	12	7.1
Total*	**169**	**100**

* denotes multiple response

Source: Field Survey, 2016

3.1.2. Economic Impact of Masara N'arziki Project

The research finds it necessary to support the perception of the participants with empirical facts and hence the need to compute the average gross margin for beneficiaries and non-beneficiaries. The average costs and revenue of the sampled farmers used in driving the gross margin is presented in Table 1.3. From the analysis, participants of the programme had a mean gross margin of GH¢2,257.7 while non-participant had GH¢705.8 as an average gross margin. This suggest that, the levels of profit of participants outweigh that of non-participant. Based on simple analogy, participants of the programme are better off compare to non-participants. According to the non-participants of the programme, the absence of extension agents, lack of subsidy on farm inputs, inadequate fertilizer and non-usage of improved farm practices and improved seeds led to low productivity which eventual affected their income. The difference in the gross margin though was great, an independent sample t-test was estimated between the mean gross margin of both participants and non-participants are shown to be significant at 99% confident level as shown in the last row of Table 3. This means that, there is a significant difference between the average gross margin of beneficiaries and non-beneficiaries of the programme

Table 3: *Gross Margin Analysis for Beneficiaries and Non-beneficiaries*

Revenue/Cost	Participant (GH¢)	Non-participant (GH¢)
Gross farm income	6,875.50	5,025.75
Less TVC:		
Cost of ploughing	1,274.70	1,143.60
Cost of labour	678.00	585.65
Cost of Seeds	455.70	447.00
Cost of fertilizer	1,486.30	1,459.50
Cost of pest and insecticide	723.10	684.20
Total variable cost	4,617.8	4,319.95
Gross margin	**2,257.7**	**705.8**
t-statistic	214.56***	

*** represents 0.01 significant.

Source: Field Survey, 2016

3.2. Results of Production function analysis

Test of the different functional forms analysed earmarks Cobb - Douglas model as the best by showing an adjusted R^2 of value 0.8216 which can be explain as 82.16% of the variance of the farmers` income can be explained by the variables presented in the model which include age of respondents, years spent in educational sector, being a participant or not, household size, number of visit by the extension agent, farm size, hired Labour, agrochemical, fertilizer, seedlings, marital status and experience from farm. The difference of 15.32% illustrates variable omitted from the model and represent by the error term. From the analysis, it shows that age, educational level of participation and marital statues were negatively associated with the income earned by the beneficiary farmers while farmers` household size, number of visit by extension agent, farm size, hired Labour, agrochemical, fertilizer, seedling and years of experience of a farmer were positively related with income earned from production. Among the variables, participation in the programme and farm size were significant at 1%, number of visit by extension officer and hired labour were significant at 5% while quantity of fertilizer was significant at 10% significant level. The intercept which is significant at 10% and a negative sign indicates that, if all the variables are to remain the same, with time, farm income will decrease by 2.3527.

Table 4: *Multiple Regression Results for Variables Affecting Participating Farmers` Income*

Variables	Coefficient	Stand. Error	t-value	P-value
Age	-0.7475	0.3563	-4.8532	0.1557
Education	-0.1563	0.2673	1.3257	0.1356
Household size	0.6421	0.2664	0.3679	0.3786
Extension service	0.3274	0.1452	0.1453	0.0469**
Participation	-0.1325	0.3254	0.7532	0.0043***
Farm size	0.6401	0.3754	2.5276	0.0002***
Hired labour	0.0246	0.0326	0.1304	0.0124**
Agro chemicals	0.0962	0.1356	3.3784	0.4164
Fertilizer	0.2528	0.2643	2.6378	0.0663*
Seedling	0.7325	0.3246	0.7432	0.1164
Marital status	-0.0532	0.0743	1.0433	0.7543

Constant	-2.3527	0.6322	0.7437	0.0563*
Number of observations = 118 R square = 0.8468				
Adj R square = 0.8216 Prob > F = 0.0000 F-Statistic = 54.8954				
Log likelihood =36.7452				

***P=0.01; **P=0.05 ; *P=0.1

Source: Field Survey, 2016

3.3. Problems associated with Masara N'arziki Project

Figure 2 below illustrates the results by frequency but in terms of percentage the challenges participants faced in the Masara N'Arziki input credit programme. The results in Figure 2 show that 36% of the participants considered the delivery time of the farm input to be inappropriate or not consistent with the rainfall pattern in the area, 27% of the farmers considered the processing procedure of the credit to be cumbersome, 19% of the beneficiaries considered the repayment within one cultivation season whether there is good yield or not to be too short and restricted, 14% of them considered farm credit disbursed to them as too small and only 4% considered the inputs given to them is some time short of quality expected. Therefore it is the expectation of the farmers that Masara N'Arziki would cut down the bureaucratic process of accessing the inputs in order to deliver the inputs to them in time, as majority of them considered processing period as time-wasting. Participants' response to poor quality of inputs cite instances of either the fertilizer being wet or the tractors not able to plough the farm lands properly
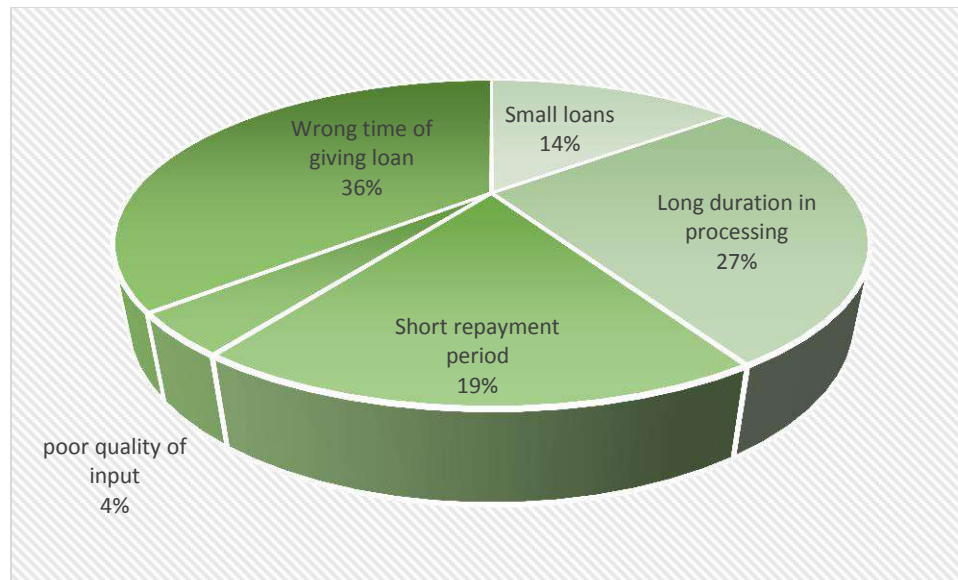
Source: Field Survey, 2016

Figure 2: *Beneficiaries Assessment of Masara N'arziki Programme Challenges*

4. Conclusion and Recommendation

General observation made from the result of the study shows that Masara N'arziki programme had positive impact on the targeted population. Based on the farmers own judgement of the programme, most of the farmers indicated that the support the programme is giving them has enabled them to educate their children, have access to quality inputs, built houses, buy motorcycles and vehicles to ease transportation of their farm inputs and produce and some marry from their farm benefits. Gross margin results show that, holding other factors constant, the different between benefits of participating in the programme and not participating is significant at 1% indicating that, participating in the programme enable a farmer to earned additional GH¢1,551.90 as average gross margin. Also, the multiple regression estimates for the variables of production show that participating in the programme, respondent age, years of education and marital status were negatively related to farmer's income while farmer`s experience in the farm, farm size, quantity of fertilizer used, number of visit by extension agents among others were positively associated with income. However, only fertilizer used, participation, farm size, hired labour and extension visit were significant to farmers` income. The research has confirmed the view of USAID and other related saying that, Masara N'arziki programme is highly beneficial to the farmers in terms of improvement in their income levels and standard of living. The research

could not hide the constraints of the programme by stating that, with the enormous benefits of the Programme, beneficiaries considered delivery of input at the wrong time as the most important problem, long duration in processing credit, shorter repayment period and small amount of credit facilities as the challenges they faced in dealing with Masara N'arziki programme.

Critical analysis of the findings from this study led to the following recommendations to ensure that proper measures are put in place for the improvement of service delivery. The finding shows that, the idea of small holder farmers cannot manage credit and does not deserved credit should be the thing of the past, hence, credit facilities should be made available to smallholder rural farmers in order to enable them acquire more modern farm implements and improved farm inputs which could lead to increase in productivity, gross margin and improve their living standards. Research finding show that, inputs are delivered to farmers or participants at the raining season and some of the farmer complain about late delivery of input, hence, measures should be put in place to ensure that, inputs are delivered in time to ensure timely application of inputs as late application of farm input reduce crop yield. The credit given to the farmers should base on the farm size to ensure adequacy of the inputs quantity and the processes involved before a farmer can secure the credit facilities need to be reduced. Though farmers complained of short time for repayment of credit, from observation, payment is made in the form of resale to the company, the study recommend that during the time of bad harvest or low yields, farmers should be given the chance to reap the benefit of their effort and payment should be reschedule for the following cultivation season. Based on the finding, Masara N'arziki Programme should be extended to other farming communities in Northern region of Ghana to aid in the reduction of poverty among rural farmers. The government of Ghana should adopt the solidarity group method of giving input credit to small scale farmers by taking in to consideration the recommendation made by this study.

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