WOMEN IN AGRICULTURE (WIA) AND RURAL HOUSEHOLDS' WELFARE IN OYO STATE; EVIDENCE FROM MAIZE ARBITRAGERS IN IBARAPA CENTRAL LGA

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ABSTRACT
Rural-urban based business is critical to poverty reduction among rural people most especially women who are mostly buying produce from the farm gate or rural market and transport them to the urban areas where it can command better price and in turn good profit. The study was carried out in Ibarapa Central Local Government Area of Oyo State to examine Women in Agriculture(WIA) as maize arbitragers and household poverty. A multistage sampling technique was used alongside 120 copies of structured questionnaire to collect data from intended respondents. The specific objectives bordered on describing the socioeconomic characteristics, categorizing respondents into poverty groups, determining the quantity of maize traded and poverty status of respondents. Results of socioeconomic characteristics showed that the majority (93.1%) were young and agile, 98% were educated while the mean age was 15 years among others. Households' classification showed that poor and non poor were 56.9% and 43.1% respectively. The OLS multiple regression result indicated chosen exponential functional form as lead equation showed that co-efficient of multiple determination($R2$) expressed that 21% of dependent variable was explained by independent variables modelled while price of maize, years of experience, years of education, and cooperative membership among others determined the quantity of maize traded by arbitragers. Probit result showed that years of education, household size, dependency ratio, household income, number of people per room and number of food intake influenced poverty status at varying significant levels among respondents. The result of hypothesis tested showed that null hypothesis was rejected at $P<0.01$ showing that there was a significant relationship between income of arbitragers and their poverty status. It was recommended that credit facilities and infrastructure be made available to ease rural business transaction.
KEYWORDS: Women, Rural Households, Arbitraging, Regression, Probit Model, FGT Model.

INTRODUCTION
The roles played by women in the improvement of rural households' welfare cannot be over-emphasized. They get involved in both farm and non-farm activities in the rural set up. However, income generated by them may be meagre or considered insignificant in most but it contributes in no small measure to meeting at least the recurrent expenditure of the rural and urban households. According to Freeman (1999), on the average, one third of women and one quarter of men on farm obtain some income from being employed off the farm and indeed, these farms had greater farm incomes than those households who did not have members who earn money off the farm. However, the income realised by women is not spent alone but for the general welfare of the man and all their children. Carolyn (1983) reported that in many developing countries, particularly in Africa, women have responsibility for meeting the day-to-day food requirement of their families while

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Morgan (2000) in the same vein stressed that, women tend to spend more on dependants including members of extended family in replacing food supplies when run out while men tend to spend more on themselves and to save the rest.

Moreover, it is worthy of note women are highly enterprising when it comes to discussing their roles in the rural economy as Boserup (1970) and Ndiyo *et al.* (2002) put the number of women that participate in small business in the Sub-Sahara at 46.7% and this therefore was further established in the fact that, many women have turned the fortunes of their families around by establishing finance markets that work for them, their families, their farms and their communities. Women in the informal sector without legal protection or security, they depend on informal trade for their survival. In the third world countries, a high percentage of food vendors were women where 94% were in Nigeria, 80% in Thailand, 63% in Philipines to mention but a few. Moreso, the percentage of rural women working in agriculture ranges from about a third in Bosnia and Herzegovina to more than half in Poland. Prakash (2003) expressed further that, across much of the developing world, rural women provide much of the labour for farming, from soil preparation to harvest; after the harvest, they are almost responsible for operations such as storage, handling stocking, marketing and processing. Specifically, women are frequently involved in marketing crops for consumption in urban markets Guyer(1980) and Van Braun *et.al.*(1989). Nonetheless, in order to make both ends meet in an average rural home, market women form co-operative groups that help them perform their family responsibilities including subsistence production, income generation, child rearing and household maintenance; moreso, the income generating role of market women receives the most focus as it is essential to their success in their other responsibilities(Okeyo,1979)..

Against the elaborate and lucid expression of the diverse roles of women in the rural set up which had in no small measure augmented it economically and foster social relationship, this study wants to beam focus on the area of arbitraging among rural women as an economic means of sustenance among them and their respective households. Morgan (2000) expressed clearly that when carefully observed, women are the major participants in non-farm activities. In the Nigerian context, women are known to be economically active and supportive when we dwell debate on the running of the household as evidently, they strive to generate income to co-finance households alongside their husband. Even at this, many women, in the rural and urban are presumed to be unable to cater for them as it is supposed to be even when they put in their entire resources into generating income for their households. Some could not afford good food, clothing, housing and worst still, not having access to productive resources which is adjudged to be bad indeed. As rural arbitraging is common among females given their level of diligence and financial status among others, this study will provide suitable answers to the following research questions: what are the socioeconomic characteristics of respondents? What are the poverty categories of respondents? What are the determinants of the quantity of maize traded by respondents? What factors determine households' welfare? And what are the constraints confronting arbitragers in their economic activities? The specific objectives of this study are to: identify and describe the socio-economic characteristics of respondents; categorise arbitragers into poverty groups; identify the determinants of the quantity of maize traded by respondents; identify the determinants of households' welfare; examine constraints in maize arbitraging business. The study is based on the hypotheses that there is no significant relationship between the monthly income of respondents and their welfare status.

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MATERIALS AND METHODS
The Study Area
This study was carried out in Ibarapa Central LGA of Oyo state. The LGA was created in 1996 and it is located in the derived/guinea savanna agro-ecological zone of the tropics. The LGA is bounded to the North by Ibarapa LGA, to the East by Ibarapa East LGA, while it is bounded in the West and to the South by Ogun state. The population of the LGA is 102,979 with 52,219 males and 50,760 females (NPC, 2006). The mean annual rainfall and temperature are about $\pm26^0C$ and 1550mm (Oyo State Ministry of Information, 2012). The area is endowed with two rainfall regimes, the modal and bi-modal; the former comes up between the March and July while the latter comes up between August and October every year and the two are separated by 'August break' every year. The area is blessed with many farmers market where farmers dispose of their farm produce on five days interval. People feom all over southwest come to these rural markets on every five days to buy or sell. The State is endowed with soil of superlative edhaphic quality which is reflected in its moderately weathered parent materials and resultant soil with high nutrient retentive capacity. This makes the soil capable to support notable surface feeder (such as maize, tomato, guinea corn, melon, watermelon e.t.c.) and deep rooted crops (such as cassava, yam, cashew, mango, oil palm e.t.c.). Moreover, numerous rural and and urban markets are present in the State, some are strictly for the sale of agricultural crops , some are strictly for industrial while some for the two commodities. Several roads link the rural to the urban and semi-urban and this eases the evacuation of the produce from rural production point to urban disposal domain through vehicular transportation means. Some commodities, in many cases, are purchased from the farm gate by buyers (arbitragers) or bought from rural market and transported to the urban for better pricing.

Type of Data and Instruments of Data Collection
Data used in this study was primary and this was collected with copies of well structured questionnaire which were administered on women arbitrager who trade only in maize crop. Some of the data collected were based on the socioeconomic characteristics of respondents (such as age, marital status, trade experience, household size, e.t.c.) while other data bordered on professional details such as the quantity of maize purchased monthly, average market price of maize per bag, number of buyers employed, cooperative membership of arbitrager and business transaction charges by government or the union.

Sampling Technique.
Multistage sampling procedure was used to select respondents for the study. The first stage was purposive sampling of Ibarapa Central Local Government in Oyo State because of its track record of massive farm production and its proximity to the big cities from where buyers of farm produce get their supply most especially arable crops without shortage. Purposive selection of ten(10) communities(Kondo, Sekere, Ibonna, Kura, Akeroro, Imeleke, Ekuku, Tobalogbo, Ogundele and Jagun Abolanle) that have high number of arable crop farmers and rural feeder road network which facilitate transportation of commodities intra and inter communities, this form the second stage. The third stage was the random selection of twelve (12) respondents from each of the ten communities which brought the total sampled size 120. However, a total of 116 respondents were used in the final analysis as four responses were dropped due to inconsistency in the responses of respondents. Table 1 below gives explicit distribution of sampled respondents.

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Table 1: Sampling Distribution of Respondents

Method Used: Multistage Sampling Technique		
First Stage	**Second Stage**	**Third Stage**
Ibarapa LGA	Kondo	12
	Sekere	12
	Ibonna	12
	Kura	12
	Akeroro	12
	Imeleke	12
	Ekuku	12
	Tobalogbo	12
	Ogundele	12
	Jagun Abolanie	12
Number Used(116)	Number dropped(4)	Total sampled(120)

Source: Field Survey, 2016

Analytical Technique

Descriptive and inferential statistics were used to analyse the primary data generated in this study. Socio-economic characteristics of respondents was analysed using descriptive statistics such as mean, mode, median and percentages. Determinants of the quantity of maize purchased from farmers by arbitragers was analysed using Ordinary Least Square(OLS) multiple regression model while the assessment of welfare and its determinants among respondents were explored using Foster, Greer and Thorbecke(FGT) poverty profile and probit regression model.

OLS Regression Model

$$Q = \beta_0 + \beta_i X_i + ... + \beta_n X_n + \varepsilon_i \qquad (1)$$

Where β is the vector of parameters (independent)

X_i = Vector independent variables

Q = Quantity of Maize Traded (in kilogramme);

X_1 = Average market price of maize (in Naira);

X_2 = Experience of farmer (in years);

X_3 = Education(in years);

X_4 = Moisture content (low=1, High=0);

X_5 = Credit obtained (in Naira);

X_6 = Co-operative membership (member=1; non-member=0);

ε_i = Error term

Poverty Line Determination

Poverty line is the value of income or consumption expenditure necessary for a minimum standard of living. The poverty line used for this study is the two-third of mean per capita household expenditure.

This is similar to the approach adopted by World Bank(2008) poverty assessment of Nigeria and as further used by FOS(1999) and Omonona *et al.*(2008) in which (1/3 MPCHHE) and (2/3 MPCHHE) were used to determine the poor and non-poor households in the study area.

$$Per\ Capita\ Expenditure = \frac{Total\ household\ monthly\ expenditure}{Household\ size}$$

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The mean per capita household expenditure (MPCHHE) is calculated thus:

$$\frac{Total\ per\ capita\ household\ expenditure}{Total\ number\ of\ households}$$

Probit Regression Model

This probability model was used to identify determinants of welfare of respondents. Variables used were chosen in line with Damodar (2004) and Apata *et al.*(2010). This was expressed as:

$$P = [yi = 1] = [FZi] \qquad\qquad 1$$

Where,

$$Zi = \beta 0 + \beta iZi \qquad\qquad 2$$
$$yi = \beta i + \beta 2iZ2i + ,...,\beta kZhi + Ui \qquad\qquad 3$$

Where

y_i = Welfare{Non-poor=1; Poor=0};
Z_1= Age {in years};
Z_2= Education {in years};
Z_3= Marital Status {married=1; otherwise=0};
Z_4 = Dependency Ratio {0-14 and >65 of age divided 15-65 x 100}
Z_5 = Household Income {in Naira}
Z_6 = Monthly Savings {in Naira};
Z_7= People/Room {No.}
Z_8 = Food Intake/per day {No.}

Test of Hypothesis

$$t = \frac{X_1 - X_2}{S_{x_1 x_2} \cdot \sqrt{\frac{2}{\pi}}}$$

where

$$S_{x_1 x_2} = \sqrt{\frac{1}{2}(S_1^2 + S_1^2)}$$

$S_{x_1 x_2}$ is the grand standard deviation(or pooled standard deviation), 1= group one,

RESULTS AND DISCUSSION

Socioeconomic characteristics of Maize Arbitragers

Table 2 shows the socioeconomic distribution of maize arbitragers. Age distribution of respondents shows that majority (93.1%) of respondents fall within the range of 21-60years while the mean age is 40 years. It could be inferred from this result that the arbitragers in the maize business are very strong and agile. The reason arises from the fact that, the work entailed is characterised with a high level of drudgery which include carrying of bulky loads of maize for assemblage over a couple of kilometres which obviously demands energy. Educational distribution of respondents reveals that arbitrager with primary school education take the lead with 53.5% which is trailed by secondary education with 43.9%; about 98% were educated. It could be inferred from this result that nowadays, local marketing of farm produce is no longer for non-literate but literate have taken over the sphere as education remains a source of advantage resulting in interaction with people of

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diverse language through the use official language(English or Pidgin) which facilitates marketing process, in particular, haggling and various negotiations. Years of experience of respondents had the highest distribution of 43.1% within the range of 11-20 years with 15 years as average. This result showed that, most of the players in the marketing of maize are still very young in terms of experience. The reason for this might be due to the brief stay of the arbitragers in the aspect of travelling from one point to the other, thereby leaving the hectic work in the hands of the young and agile agents and they will serve as principals that would be reported to. Majority (68.2%) of arbitragers are married while 31.8% percent are single, separated or widowed. The result implies that, women arbitragers believed strongly in family lifestyle and intuitively ready to be responsible. Household size of respondents shows that the highest of 50.8% fall within the range of 6-10 members and the mean household members of 6 in the study area. Inference from this result shows that, most of the households of arbitragers are moderate and this can be strongly informed by the education and proper information that they have on family planning method; moreso, since their primary work is itinerary, the sizable number of children in their care will be easy to cater for with minimum dependence on neighbour. Result on monthly income of respondents shows that, majority(62.9%) of arbitragers fall within the range of N20,001-N60,000 while the mean monthly income stood at N56,140(equivalent to US$ 153.81/month and US$5.13/day), this is contrary to World Bank(2008) which maintained that majority of households in Nigeria subsist on US$1/day. It could be inferred from this result that most of the arbitragers' households in the study area have relatively good welfare.

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Table 2: Socioeconomic Characteristics of Respondents

Parameter	Frequency(F)	Percentage (%)	Mean
Age(in years)			
≤20	03	2.59	
21-30	26	20.41	
31-40	31	26.72	40 years
41-50	32	27.59	
51-60	19	16.38	
>60	05	4.31	
Educational Level			
Non-formal	02	1.72	
Primary	62	53.46	Nil
Secondary	51	43.96	
Tertiary	01	0.86	
Experience(in years)			
<10	34	29.31	
11-20	50	43.10	15 years
21-30	27	23.28	
>30	05	4.31	
Marital Status			
Single	20	17.24	
Married	79	68.10	Nil
Separated	10	8.63	
Widowed	07	6.03	
Household Size			
<6	43	37.07	
6-10	59	50.86	6 members
11-15	14	12.07	
>15	-	-	
Monthly Income(in Naira)			
≤20,000	19	16.39	
20,001-40,000	73	62.93	N36,140.00
>40,000	24	20.68	
Total	116	100.0	-

Source: Field Survey, 2016.

Poverty Profile of Respondents

The poverty profile of arbitragers is presented in Table 3. About 43 percent for non-poor, 21 percent of moderately poor and 36 percent of the poor households. Summarily, 63.79 percent are non-poor while 36.21 percent are poor. It could be inferred from this result that, the majority of arbitragers' households are non-poor. This shows that arbitraging business in the study area is life-transforming as it serves as a good income source for households.

Table 3: Poverty Profile of Respondents

Profile	Frequency(F)	Percentage (%)
Non Poor	55	43.10
Moderately Poor	24	20.69
Core Poor	42	36.21
Total	116	100.00

Source: Field Survey, 2016

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Determinants of the Quantity of Maize Purchased By Arbitragers

Multiple regression estimate of the determinants of the quantity of maize purchased by arbitragers is presented in Table 4. Of all the functional forms fitted to the date, exponential was the line of the best fit. Adjusted coefficient of determination (Adj. R^2), 0.2142 showed that about 21% of the dependant variable was explained by independent variables modelled. Moreso, F-value (6.22) was found to be significant at 1 percent level. This shows the viability of the tool as being fit and appropriate for the analysis.

Price of maize, experience of arbitrager, education of arbitragers, moisture content of maize, and credit obtained in the previous season. All these variables had signs of interest and found to be significant at 1%, 5% and 10% levels. Price has an inverse relationship with the quantity of maize purchased and moreso found to be significant at 10 percent. A unit decrease in price of maize leads on the average to 123.8692 unit decrease in the quantity of maize purchased. This result shows that there is a sharp reaction to demand by arbitragers when the price of maize increased in the rural market. Marketing experience has direct relationship with the quantity of maize purchased by arbitragers. A unit increase in experience of arbitragers leads on the average to 80.1602 unit increase in the quantity of maize purchased. It could be inferred from this result that, some arbitragers with more experience stand a better chance of buying more of maize owing to the fact that they know every nooks and crannies of the rural areas where they can get more of the commodities purchased easily at good price due to many years they had been in the business.

Year of education has a direct relationship with the quantity of maize purchased by arbitragers. A unit increase in the years of education of arbitrager leads on the average to 32.9152 unit increase in the quantity of maize purchased. It could be inferred from this result that, arbitragers with more years of education had tendency of purchasing more of maize as, education helped a lot in strategising on reaching out to locations where the commodity is available for mass purchase. Moisture content has an inverse relationship with the quantity of maize purchased by arbitragers and was found to be significant at 5%. A unit increase in the moisture content of maize leads on the average to 22.8790 unit decrease in the quantity of maize purchased by arbitragers. We can infer from this result that, arbitragers purchase maize with lower moisture content as there is a wide time lag between the period of purchase and the time of delivery; this is filled with assemblage and transportation periods to the point of final sales which in many cases cover couples of kilometres. However, if water content is high, it encourages mouldiness which eventually reduces the market value of maize or total destruction which is a colossal loss.

Amount of credit obtained by arbitragers in the previous season has an inverse relationship with the quantity of maize purchased and also found to be significant at 5% level. A unit increase in credit obtained in the previous season leads on the average to 37.3135 percent increase in the quantity of maize purchased by arbitragers. The result indicates that, credit encouraged purchase of more quantity of maize as it remains a source of purchasing power. Therefore, with more of credit obtained by arbitragers, there was more quantity of maize purchased from the rural domain. Cooperative membership of arbitragers has a direct relationship with the quantity of maize purchased from rural domain and this was found to be very significant at 1% level. Cooperative membership, according to the result helped in procurement of more maize but if otherwise, there may be a purchase restriction or more money would be paid on the quantity purchased. Whereas, a member may pay less on every bag or kilogramme of maize purchased. Based on this, a cooperative member would be able to buy more of the commodity when the money he was to otherwise spent on miscellaneous charges is spent on buying additional quantity of maize.

Table 4: Multiple Regression Result for Determinants of Quantity of Maize Purchased by Arbitragers.

Variables	Linear	Semi-log	Exponential	Double log
		Functional Forms		
Constant	1003.656***	6.6862	1182.525***	6.2059***
	(229.806)	(0.2852)	(1365.161)	(1.7128)
Price(N)	-0.0462	-3.4×10^{-5}	-123.8692*	-0.4918
	(0.0612)	(0.0001)	(170.3946)	(0.2138)
Experience(Yrs)	-4.3014	0.0075**	80.1602**	0.1434**
	(3.2772)	(0.0041)	(45.3133)	(0.0585)
Education(Yrs)	-16.0759**	-0.0179	32.9152**	-0.0378
	(8.0954)	(0.0100)	(26.2992)	(0.3300)
Moisture Content	-145.1005**	-0.1281**	-22.8790**	-0.0208**
	(56.0841)	(0.0696)	(7.9873)	(0.1002)
Credit(N)	0.0127***	1.62×10^{-5}***	37.3135***	0.0411***
	(0.0043)	(5.397×10^{-6})	(8.4593)	(0.0106)
Co-op Memb.	-131.4362**	-0.1364***	-71.6516**	-0.0748***
	(76.2472)	(0.0946)	(18.0701)	(0.0227)
R^2	0.1988	0.1990	0.2552	0.2391
Adjusted R^2	0.1547	0.1549	0.2142	0.1972
F- ratio	4.51	4.51	6.22	5.71
Prob.	0.0004	0.0001	0.0001	0.0001

Source: Field Survey, 2016. *** *Significant@ 1%, ** Significant@ 5% and * Significant@1%*

Determinants of Poverty among Arbitragers

Determinants of Poverty among arbitragers are presented in Table 5. Significant variables among the total model possessed signs of interest and level of significance in tandem with *a priori* expectation. These are: years of education, household size, dependency ratio, household income, number of people per room, and number of food taken daily.

Years of education was found to be directly related to non-poor status of households and was found to be significant at 5% level. A unit increase in the year of education of arbitragers leads to 0.1230 unit increase in probability of non-poor status of households. It could be inferred from this result that, an increase in years of education increased the probability of non-poor status of arbitrager's households.

Household size was found to have inverse relationship with the non-poor status of households and was found to be significant at 5% level. A unit increase in the number of household member lead on the average to 3.4928 unit decrease in probability of non-poor status of households. It could be inferred from this result that, as household size increases, there is a tendency that welfare facilities at home are over-stretched, hence high deprivation from welfare.

Dependency ratio has an inverse relationship with the non-poor status of households and was found to be significant at 5% level. A unit increase in dependency ratio leads on the average to 3.4938 unit decrease in the probability of non-poor status of households. This result shows that, with a high number of non-productive members in the households, there is a tendency that, food, money, clothing and the host of others would be in short supply and thus, lowers non-poor status of households.

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Household income has a direct relationship with the non-poor status of households and was found to be significant at 1% percent level. A unit increase in monthly household income leads on the average to 0.0012 unit increase in the probability of non-poor status of households. It could be inferred from this result that, households with more income has more purchasing power. Based on this, they are able to meet the basic needs of the hosehold.

Number of persons per room is negatively signed and found to be significant at 5% level which is in tandem with the *apriori* expectation. A unit increase in the number of person in a room leads on average to 0.0017 unit decrease in the probability of non-poor. It could be inferred from this result that, most households, for the fact that they cannot afford to pay enough rent for getting more rooms and leave comfortably due to meagre income. Based on this, they are jam-packed inside a room which in most cases resulted in other adverse happenings.

Number of food intake per day is positively signed and found to be significant at 1% level. A unit increase in the number of food taken per day leads on the average to 0.3746 unit increase in the non-poor status of respondents.

Table 5: Probit Estimate of Determinants of Poverty Among Arbitragers

Parameter	Coefficient	Standard Error	Elasticity
Constant	4.2820	1.2483	-
Age(in years)	-0.0154	0.0215	0.0050
Education(in years)	0.1230	0.0569**	0.0403
Marital Stat(M=1;	0.3239	0.4097	-0.1062
F=0)	-0.3974	0.1229***	-0.1304
Household Size	-3.4928	2.3162**	-1.1455
Dependency Ratio	0.0012	0.0004***	0.1601
Household Inc.	-0.0265	0.0338	-0.0087
Monthly Savings	-0.0017	0.0004**	-0.0450
People/Room(No.)	0.3746	0.3362***	0.1246
Food Intake(No.)	-37.76		
Log likelihood	0.52		
Pseudo R²	0.00		
Prob(χ^2)	81.8		
LR(χ^2)			

Source: Field Survey, 2016.   *** Significant@ 1%, ** Significant@ 5% and * Significant@1%.

Test of Hypothesis

Test of hypothesis for the significant relationship between monthly income of respondents and their poverty status is presented in Table 6. The t-value for the monthly income and poverty status were 45.004 and 13.973 were found to be significant at P<0.01. Therefore, the null hypothesis is rejected while the alternative hypothesis which postulated that, there is significant relationship between income and poverty status of respondent was accepted.

Table 6: Test of Hypothesis

Variable	t	df	Sig.(2-Tail)	Mean Diff.
Monthly Income	45.004	115	0.000	2327.84
Poverty Status	13.973			0.63

Source: Field Survey, 2016.

CONCLUSION AND RECOMMENDATIONS

Monthly income is critical to non-poor status of respondents in the study area. It could be concluded that, households with more income were found to be above poverty line while those that are otherwise are poverty stricken. It could be recommended that, credit facility and rural infrastructure (e.g. road) should be provided for arbitragers as a means of empowerment and reduction in transportation fair of commodity as good road brings about reduction in transport fare. which in turn, reduces total expenses incurred and widened profit margin.

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