

Impacts of integrated scheme on livelihood and rural housing condition in Nigeria

Adedayo Ayodeji Odebode
*Department of Estate Management,
Faculty of Environmental Design and Management,
Obafemi Awolowo University, Ile-Ife, Nigeria*

Abstract

Purpose – The purpose of this paper is to examine the impact of integrated rural development scheme on livelihood and rural housing condition in selected rural areas in Osun state. This is prompted by the need to develop effective strategy for improving the rural housing condition in Nigeria.

Design/methodology/approach – The impacts of the scheme were measured through survey of 344 participants obtained from 28 active communities out of the 36 communities' coverage by Rural Development Programme of Justice Development and Peace Makers's Centre through a multi-stage sampling. Both qualitative and quantitative data were obtained from the respondents. The data were analyzed through descriptive statistics, frequency distribution, correlation and regression analysis.

Findings – The result revealed that the mode of operation of the integrated scheme is to educate farmers on best farming practices. The integrated scheme had contributed positively to the livelihood of the respondents by providing stable source of finance than any other available finance source options, and it increased assets and skill acquisition and ability to have more combination of livelihood options as a result of the intervention. In addition, the number of respondents without personal accommodation also decreased at a significant proportion after the intervention. Also, notable numbers of respondents have increased access to domestic housing facilities such as, well, pit toilet and electricity. The result of the correlation analysis showed further that respondents with more livelihood assets and larger household size most often have a better housing condition, whereas the regression analysis revealed that change in the household size and change in livelihood assets lead to change in the housing condition. The paper suggest that integrated scheme could be used as a self-financing strategy for both qualitative and quantitative improvement of rural housing in Nigeria if the scheme enjoys the requisite government support in terms of adequacy of finance and more government agency participation for wider coverage.

Originality/value – The paper is one of the pioneering studies in Nigeria.

Keywords Impacts, Livelihood, Housing condition, Integrated scheme

Paper type Research paper

1. Introduction

Housing is one of the three man's basic needs, and thus, its importance as indicators to health, income, status and productivity cannot be overemphasized. Though housing problem is universal, it is more endemic in Sub-Saharan Africa. Housing problem could either be qualitative and quantitative in nature. Although the experience in advanced countries is mostly qualitative, housing challenges in Africa are twofolds. The experience in most African countries is over-congestion of their cities due to high rural-urban migration that is an aftermath of complete neglect of rural infrastructural facilities development. This accounted for inadequate qualitative and quantitative housing in African countries.

World over qualitative and quantitative housing are one of the major facilities that have proven to improve efficiency and productivity. This is completely lacking in most Sub-Sahara African countries especially Nigeria. In Nigeria, government has embarked on several housing policies through First National Development Plan (1962–1968), Second National Development Plan (1970–1974) and Third National Development Plan (1975–1980) among others to address housing problem in the country (Olayiwola *et al.*, 2005). A review of Nigerian government housing policies suggested that it is urban oriented with little or no



attention given to rural housing (Odebode and Oladokun, 2010). From available literature such as Omuojine (2000), Olayiwola *et al.* (2005), cited in Akande (2008), Odebode and Oladokun (2010) and Ibem (2010) on review of government housing policies, there is neglect of rural housing by the government housing corporations and private developers in Nigeria. This assertion is upheld by Udoh and Uyanga (2013) in their study on housing condition and health in rural Nigeria. The paper suggested that there is need for intervention toward rural housing to enhance rural dwellers health quality, and hence, increase productivity and improved well-being. The need for intervention on rural infrastructure especially housing is also apparent in the study of gender and spatial variation of poverty in selected rural settlements in Oyo state by Popoola (2012) which opined that there is severe poverty in the rural areas. Consequently, based on these authors' opinions Gasu *et al.* (2010), Popoola (2012) and Udoh and Uyanga (2013), rural dwellers are financially handicapped to provide qualitative housing for themselves, hence, the relevance of this study.

According to Department for International Development (2015), better domestic infrastructure such as water, electricity, toilets and housing accommodation are usually core components of well-being. Similarly, Rahimberdi and Asghar (2011) used availability of infrastructure as part of the indicators to measure both qualitative and quantitative housing quality in Iran urban areas. Be that as it may, availability of infrastructure could also be used to measure rural housing quality.

The components of well-being according to Sule *et al.* (2013) and Udoh and Uyanga (2013) are lacking in most rural areas in Nigeria. The availability of these domestic infrastructures will increase working hours through time saved from domestic work such as hours saved on time spent to fetch water from long distance, and ability to work longer hours due to improved health among others.

Studies on need for sustainable housing policy in selected urban fringes and livelihood improvement in rural areas of Nigeria such as Morse *et al.* (2009), Yusuf (2010) and Amao (2014) abound in the literature. However, livelihood improvement studies based on integrated approach especially on housing condition in Osun state are scanty. As the opportunity for cost recovery of investment in rural areas is very low, both public and private investors are not desirous of investing in rural infrastructural development such as provision of low cost housing, water facilities, roads and electricity that could enhance rural activities. Countries such as India and Kenya that are having similar challenge of neglect in the development of rural areas and urban slum areas by public and private sectors have adopted integrated approach to urban slum upgrading and rural development (Majale, 2004). Having similar challenges in emerging economies such as India and Kenya, it is not out of place to examine the impact of the existing integrated scheme in Nigeria. As a result, the study's focus is to examine improvement on rural livelihood and housing condition through an existing integrated scheme initiated by Rural Development Programme (RUDEP) Unit of Justice Development and Peace Makers' Centre (JDPMC), Catholic Diocese of Osogbo, Osun state, Nigeria in selected rural communities in the state. The JDPMC integrated scheme is initiated to improve livelihood of poorer farmers in the study area.

Integrated housing scheme is a holistic approach to poverty reduction through integrating income generating activities and housing improvement in the livelihood programmes of the partner groups in a project. The remaining part of the paper is structured as follows: following the background is the review of past studies. The research method is discussed in Section 3, whereas the discussions of findings and conclusions are contained in Sections 4 and 5, respectively.

2. Review of past studies

Tonts *et al.* (2001) opined that economic development of rural areas is contingent upon the availability of good quality and affordable housing stock. Therefore, rural housing is an

important indicator for measuring rural dwellers' quality of life and well-being. Tiwari (2007) and Hsiao (2016) opined that there is marginalization of rural housing in India and Taiwan. Similarly, evidence through review of literature such as Nyagba (2009), Odebode and Oladokun (2010) and Ibem (2010) among others shows that there has been neglect of rural housing in terms of policy and implementation in Nigeria. Hence, there is a need for this study.

Unwin (1997) provided analysis of rural change in the Baltic state of Estonia. The author used the information obtained from literature reviews. The author opined that an integrated approach to rural development will be a good strategy to boost rural economy in the future. The paper though takes cognizance of the role of integrated approach to boosting rural economy in Estonia is not empirical. Furthermore, the paper fails to implement integrated approach to solving rural economic problems, but, only suggests the adoption of integrated approach to rural development in a country that is more advanced than Nigeria.

Shortall and Shucksmith (1998) reviewed the literature to enable the evaluation of the experienced Leader 1 in Scotland and local rural partnerships. To achieve this, the paper focuses on the legitimacy of rural development partnerships and local governance, the goals and process of rural development, the time allocated for pre-development and training of animators. The paper though is not empirical; it makes suggestion for future European and national rural development policy and practice. But it fails to consider relationship among integrated scheme, livelihood improvement and housing condition that is the focus of the current research in Nigeria.

Andrew *et al.* (2001) study focused to develop a conceptual framework that relates the functions and attributes of poor people's assets to their livelihood status and strategies in Mexico. The authors embarked on a preliminary analysis of small livestock keeping using correlation analysis and cross tabulation. The findings revealed that different paths of rural poverty involve different strategies and, hence, different patterns of change in asset holdings, functions and attributes. The findings were based on data obtained in another country, and it was not focused on evaluating the potential of integrated scheme to improving rural housing condition.

Majale (2004) adopted a Sustainable Livelihood Approach (SLA), and percentages in the study that focused on promotion of sustainable shelter delivery strategy for the urban poor in India. The study finds that an integrated approach to urban housing development most certainly has significant potential. The research was conducted outside Nigeria and was also targeted at improving the informal housing condition in urban area.

Lall and Lall (2006) in their study aimed to reduce urban poverty jointly through the routes of income and housing using an Integrated Approach to Sustainable Development. The findings show that the research brings out the inadequacy of providing only secure tenure and access to housing credit to the poor, without being accompanied by income enhancement strategies. The gap is that the paper used data obtained in India to test the applicability of the strategy.

Robert (2008) in his study of livelihood strategies used a least squares approach to tackle challenges faced by the poor households in Ecuador. The results show that most households could achieve higher well-being if they engage in non-farm activities. However, it differs from the current study's focus that is based on evaluating impacts of integrated approach on livelihoods and rural housing condition in Nigeria.

Morse *et al.* (2009) used a SLA through an integrated scheme to boost rural economy in the middle belt of Nigeria. The objective of the study was to enhance access of farmers in the selected villages to the micro-credit scheme with the aim that the fund will be used to increase their farming productivity. Participatory techniques were adopted to characterise, ranked and scored capital assets of rural livelihood strategies. The paper identified and examined available capitals, vulnerability of these capitals and the coping strategy adopted

in the representative villages. Though the paper used Nigerian case study that has similar indicators such as income, expenditure, capital assets in terms of tree crops, food crops, membership of association, hazards among others, it failed to evaluate the impacts of existing integrated agricultural extension project on rural housing condition in Nigeria.

Yusuf (2010) in the study on gender analysis of livelihood strategies of household heads in rural areas of Osun state, Nigeria, used 252 respondents selected through a multi-stage sampling technique. He opined that livelihood strategies adopted by male and female heads of households are similar, but, there is difference in accessibility of each head of household to productive resources. The study went further to establish correlation among age, household size and livelihood strategies and it also established that there is no association between religion and marital status. The gap is that the study is not focused on the impact of the integrated scheme on rural housing condition but concerns with opportunities for different combinations of livelihood strategies opened to both male and female household heads in rural areas of Osun state, Nigeria.

Fang *et al.* (2014) conducted a sensitivity of livelihood strategy in China. Using a standard deviation analysis, the findings reveal that only livelihood capitals will be helpful in the long term. But, they are to be complimented by relative policies that enhance capital capacity as well as increase access to capitals. Though the study emphasized the importance of policies on increase access to capitals, it did not examine the relationship between income generating activities and housing improvement.

In addition, Keffa (2014) in a case study of integrated housing development program in Addis Ababa, Ethiopia that was geared toward reducing urban poverty and to also reduce housing problem of the city opined that the integrated program is successful. The program generated significant employment and helped tremendously in upgrading slum. The current study though similar to the study under review defers because Keffa (2014) study focused on urban area in another country.

Muchara *et al.* (2014) in their study adopted a SLA to assess improvement in the productivity of small holders irrigation farmers in South Africa. The findings reveal that the performance of the farmers is hampered by inadequate financial capital and poor coordination of government funded projects. The study is not focused on rural housing improvement but on improving farmers' productivity through irrigation schemes in South Africa.

Thennakoon (2015) in the study on the influence of proximity to the city center asserted that regional imbalances in socio-economic development in Sri Lanka is caused by availability of livelihood assets, level of government development intervention and the variation in physical environment. The study utilized primary data collected from four villages with emphasis on capital assets and strategies through the assessment of seven core income generating activities, and used participatory techniques to characterise, rank and score capital assets of rural livelihood strategies based on their level of dependency. The finding reveals that villages in close proximity to Colombo Metropolitan Region (CMR) have better livelihood, whereas the contrast is the case of villages distant from CMR. The study only considers how increase in people's livelihood assets (such as social, physical, financial, human and natural) can be used to reduce regional imbalance in income and reduce poverty. No inference is made on improvement on rural housing condition which is the focus of the current paper.

Milada *et al.* (2015) used analysis of the frequency, travel time and public transport fare to conduct comparative analysis of demographic development on rural areas in Czech Republic. The result is used to present urbanization processes such as suburbanization, counterurbanisation among others. The finding is not focus on the influence of integrated scheme on livelihood and housing condition in the rural areas. The paper uses facts of Czech Republic which is more advanced economically than Nigeria.

Salemink *et al.* (2015) in the study of rural development in the digital age reviewed 157 papers on digital developments and rural developments in advanced countries.

The paper distinguished research into connectivity research and inclusion research. The finding shows that the hampered diffusion of technologies and the lower average levels of education and skills in rural areas have negative impact on adoption and use. The paper concludes that the rural that are most in need of digital connectivity to cushion the effect of their remoteness are poorly connected. The paper is not focused on improving rural housing via an integrated scheme but rather canvassed for improved rural development through digital connectivity in advanced country. It is also not an empirical study.

Giri (2017) study evaluated various government programmes such as sectoral programmes and state investment in employment generation in the public sector geared toward poverty alleviation through review of past studies. The paper observes the inadequacy of adopting wage employment programmes to alleviate poverty in India because the scheme failed to produce desired result. The paper is not empirical and rural development approach that the study evaluated is not an integrated approach which is the current study's focus in Nigeria.

3. Methodology

The study area was stratified into four administrative zones where there was intervention by RUDEP of JDPMC in Osun State, Nigeria. The administrative zones were located at Ijesa, Ila, Osogbo and Atakumosa. The preliminary investigation revealed that there were 36 communities in the entire zones, but only 28 of them were functioning and active. As such, the study was limited to the active and functioning communities. The total numbers of functioning communities in each zone in the study area were as follows: Ijesa (5), Ila (6), Osogbo (10) and Atakumosa (7) totaling 28 communities. The usual practice of RUDEP is the formation of farmers' cooperative group in any area where they intervened. As such, the participating farmers usually have monthly meetings in the respective zones. Information from regular meeting of the farmers showed that there were 89 farmers at Atakumosa zone, 57 farmers at Ijesa, 106 at Ila and 165 at Osogbo totaling 417 participants. In total, 80 percent of the participants in the entire zones were proportionally administered questionnaire at the monthly meetings totaling 344 respondents for the study (see Table AI for detail). The coordinating supervisor for the entire administrative zones was also interviewed to elicit information about the scheme. The data obtained were analyzed using frequency and percentage, correlation and regression analysis. This is similar to the sampling method adopted by Yusuf (2010).

The objective of JDPMC is to improve the livelihood of poorer farmers. The scheme focuses on small and medium scale youth farmers and women that engage in agricultural-related activities. Enquiries were made into the socio-economic characteristics of HH heads to obtain their baseline information that form the basis for the intervention process to be adopted by the initiator of the integrated scheme in the study area from 1996 to 2015 (see Table AII).

The participants were asked questions related to the mode of operation for the purpose of triangulation. This is in consonance with Thennakoon (2015). The essence of triangulation is to confirm the consistency of information on the same subject from different group of respondents. Information on respondent's age, HH size, total revenue, livelihood assets and housing condition was elicited from respondents through structured questionnaire. The JDPMC administrative zones were used for the project because the level of the intervention was more intensive than any other NGOs or educational institution in Osun state. The data obtained were analyzed through descriptive statistics, correlation and regression analysis.

The percentage of assets before and after RUDEP intervention was calculated; thus:

$$\text{Before} = \frac{\text{Number respondent that has a particular assets before the intervention}}{\text{Total number of respondents}},$$

whereas:

$$\text{After} = \frac{\text{Number respondent that has a particular assets after the intervention}}{\text{Total number of respondents}},$$

where the total number of respondent is 340. For example, house ownership before intervention equals:

$$116 = \frac{34.1\%}{340}.$$

4. Discussion of findings

The findings of the paper are as follows.

Question was asked on the mode of assistance to the participants of the integrated program in selected rural communities in Osun State.

Based on personal observation during the field survey, the modes of operation adopted by RUDEP are to; form farmers' cooperative group at every target community, organize monthly meeting with respondents in each cooperative group, organize demand driven quarterly workshop in each zone, improve farmers' skills via education and training on best farming practices, upgrade farmer's' technical efficiency via collaboration with international organizations and Federal and state Ministry of Agriculture and also to assist farmers to have access to water pumping machine for irrigation farming of pepper among others at highly subsidized rate. Furthermore, RUDEP links farmers to mainstream marketing channels for better price of their products, gives free/subsidized improved seeds and seedlings, provide financial assistance with minimum interest to farmers, and organizes yearly agricultural show/ farmers forum where prizes are given to the best farmer from each zone.

For the purpose of triangulation as was applied in Thennakoon (2015), Table I reveals that the mode of operation adopted for intervention by RUDEP to improve the livelihood of participants are; giving of free improved seed, financial assistance, education of farmers and giving of technical support.

Findings show that majority of, 59 percent, respondents are of the opinion that educating farmers on best farming practices such as cocoa spacing, cutting edge of farmlands to control fire hazards, how to improve productivity by self-made organic manure, and how to control pest through the use weeds to make insecticide among others are RUDEP's mode of intervention. This could be because educating farmers would afford them of using the resource judiciously thereby enhancing their productivity. It was also revealed that 14 percent respondents (that are participants' farmers) enjoy technical support via quarterly organized workshop at each zone. The organized workshop enables farmers to interact with invited guest or RUDEP staff with the necessary technical expertise. The other modes of intervention such as improved seed and financial assistance are having response rate of

Variable	Frequency	Percentage
Improved seed	7	2
Financial assistance	7	2
Education of farmers	200	59
Technical support	48	14

Note: Multiple choices
Source: Field survey (2016)

Table I.
Mode of assistance to
the participants of the
integrated program

2 percent and 2 percent, respectively. This implies that the RUDEP main mode of operation is to educate farmers on best farming practices followed by technical supports.

The participants were asked the assets they acquired before and after RUDEP intervention (Table II).

There is a notable increase in assets of respondents such as cars from 0.6 to 2.6 percent, equipment's like grinding machines from 2 to 3.5 percent, purchase of more agricultural lands to increase their scale of production from 21 to 24.1 percent, increase in house ownerships after the intervention from 34.1 to 42.7 percent and purchase of generator from 0.6 to 17.1 percent. It implies that notable number of respondents acquired more assets such as houses, farmland/land, car, grinding machine and generator after the intervention. The respondents with cars are getting additional income from using the vehicle to transport agricultural produce to towns and cities on commercial basis. Similarly, those with grinding machines obtained additional income from grinding agricultural produce such as cassava. Acquisition of additional land by some participants enables them to increase their agricultural productivity. Hence, most farmers have improved livelihood after the intervention due to their ability to have more combination of livelihood that could lead to increase in their income. Therefore, inference can be made that the RUDEP-integrated scheme had positive impacts on the lives of participants. It has the capacity to improve their livelihoods and housing condition because of the additional capital assets that could be used for different livelihood combination strategies. It means the greater the opportunities for different livelihood combinations, the higher the potential to enhance increase income. This is in consonance with Majale (2004), Lall and Lall (2006) and Keffa (2014) that integrated scheme has the capacity to increase income of the poor in which notable part of the increased income was invested in housing.

The respondents were asked the additional activities they are engaging in due to RUDEP intervention.

The result in Table III shows that due to RUDEP-integrated skill training scheme, 10.6 percent of the respondents added making of organic fertilizer from animal and plant residue and domestic waste to their activities, 2.6 percent added improved cassava varieties cultivation, 25.9 percent engaged in other farming practices such as Fisheries, Bee keeping (Apiculture), Oil Palm Plantation and processing with modern machine, whereas 9.4 percent (mostly women) embraced craft making such as kampala making. The overall results reveal that 48.5 percent of the respondents engaged in additional activities. Consequently, some of the participants got into apiculture, poultry, fishery introduced to them by RUDEP that is highly financially rewarding. Hence, most farmers have improve livelihood after the intervention due

Variable	Frequency before	Frequency after	Percentage before (%)	Percentage after (%)	Percentage increase or decrease in asset (%)
House ownership	116	145	34.1	42.7	8.6
Purchase of farmland/land	71	82	21	24.1	3.1
Car ownership	2	9	0.6	2.6	2
Motorcycle ownership	24	22	7	6.5	-0.5
Grinding Machine ownership	7	12	2	3.5	1.5
Generator purchase	2	58	0.6	17.1	16.5

Table II.
Asset before and after
RUDEP intervention

Note: Multiple choices
Source: Field survey (2016)

to their ability to have more combination of livelihood that led to increase in their income which could lead to improve well-being and better housing condition due to such additional activities. This finding is in line with the findings of Andrew *et al.* (2001) that functions and attributes of the poor are related to their livelihood assets and different combination of strategies.

The participants were asked the sources of finance they have access to.

The result in Table IV reveals that majority 75 percent of the respondents were able to raise fund to improve their productivity through the RUDEP farmers' cooperative, followed by 44.4 percent that obtained loan through private money lenders, 42.7 percent raised fund through personal savings, 8.5 percent respondents sourced their funds through friends and relatives, 5 percent patronized micro-finance bank, and 4 percent and 2 percent enjoyed regular remittances/pension and grants/aids. The inference is that RUDEP's integrated scheme had contributed immensely to solving the problem of finance for rural dwellers in the study area through the farmers' cooperative. The farmer's cooperative is one of the modes of operation adopted by RUDEP. The result is an indication that sourcing of funds from the finance sector or formal organizations is a major challenge to farmers. Only 5 percent were able to access fund through micro-finance and 2 percent respondents had access to fund through grants/aids. Lack of adequate access to large funds could limit the ability of participants to expand their farming operation that would lead to improvement in the farmers' productivity, income and livelihood. Majority 75 percent respondents were able to source finance for their farming activities via the integrated scheme's farmers' cooperative to improve their livelihood. This is contrary to sources of finance to farmers in rural areas via micro-finance scheme and wage employment program stated in Morse *et al.* (2009) and Giri (2017).

The participants were asked question regarding their investment in housing after RUDEP intervention.

Variable	Frequency	Percentage (<i>n</i> = 165)
Making of organic fertilizer	36	10.6
Cassava cultivation	9	2.6
Farming (Apiculture and Fisheries)	88	25.9
Craft	32	9.4
Note: Multiple choices		
Source: Field survey (2016)		

Table III.
Additional activities
after RUDEP
intervention

Variables	Frequency	Percentages
Farmers' cooperative	255	75
Micro-finance	17	5
Grants/aids	7	2
Personal savings	145	42.7
Regular remittances/pension	14	4
Loan from relatives/friends	29	8.5
Loan from private money lenders	151	44.4
<i>Frequency of regular receipt of pension and remittance</i>		
Pension	3	1
Remittance	14	4
Note: Multiple choices		
Source: Field survey (2016)		

Table IV.
Available sources of
finance to the
participants

The result of respondents' investment pattern after the intervention is presented in Figures 1–4. Figure 1 reveals that the number of respondents without any personal housing asset decreases from 15.9 percent within the period 2000–2003 to 12.7 percent within 2004–2007, 10.6 percent within 2008–2011 and to 8.5 percent for the period 2012–2015. Conversely, there is an increase trend in the acquisition of 2–4 rooms' apartments, 5–6 rooms' apartments and slight increase in the trend in acquisition of 8–9 rooms' apartments during the period studied. The trend for two rooms' apartment is 24.7 percent within period 2000–2003, 26.2 percent within 2004–2007, 26.8 percent within 2008–2011 and 28.5 percent for the period 2012–2015. In total, 5–6 rooms' apartments' trend is 24.4 percent within period 2000–2003, 26.1 percent within 2004–2007, 27.1 percent within 2008–2011 and 27.1 percent for the period 2012–2015, whereas trend for 8–9 rooms' apartments is 35 percent within period 2000–2003, 35 percent within 2004–2007, 35.6 percent within 2008–2011 and 35.9 percent for the period 2012–2015. The implication is that there is decrease in the number of respondents without personal house and increase trend in the acquisition of 2–4 rooms' apartments, 5–6 rooms' apartments and 8–9 rooms' apartments among participants in the study area. Also, more of the respondents acquired 8–9 rooms' apartments after the integrated scheme. Thus, one could infer that the RUDEP-integrated scheme has the potential to be instrumental to this trend. This finding is in consonance with the result in Majale (2004) and Lall and Lall (2006) that there is improvement in housing due to the integrated schemes. Greater numbers of the respondents have either 5–6 rooms apartments or 8–9 rooms apartments. The lesser number of the respondents that have 2–4 rooms apartments and this might be because most of the respondents have large household size. During the field work, it was observed that most of the housing assets were located in the villages, whereas those respondents with more than one houses built the second house in nearby towns or their home towns.

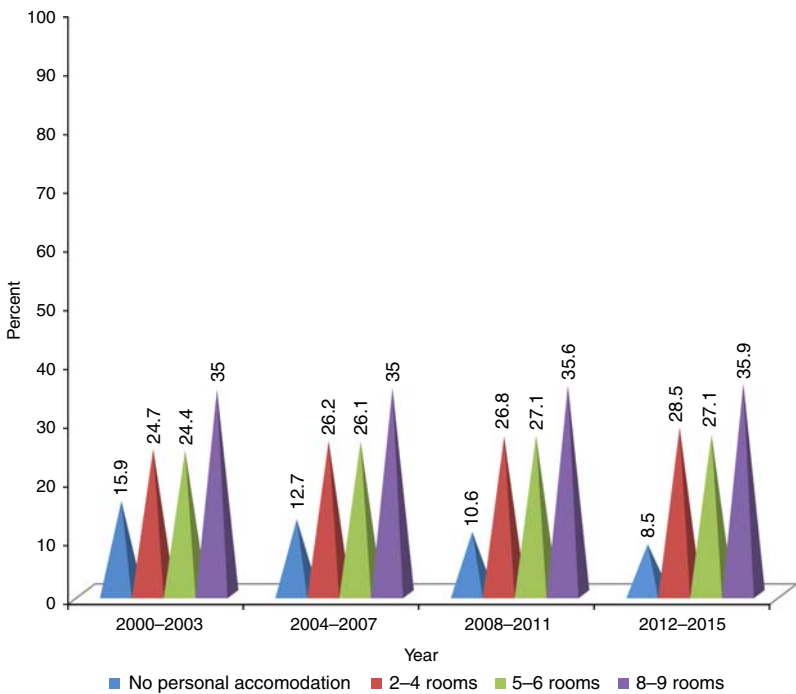
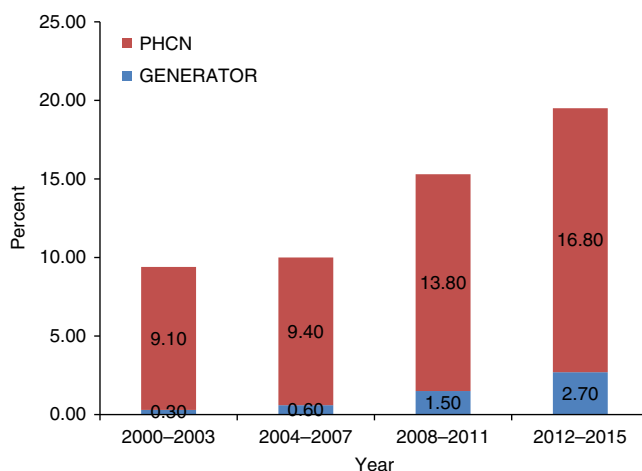


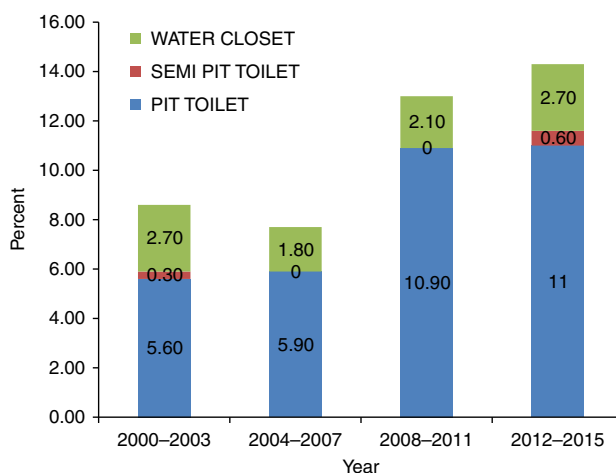
Figure 1.
Trends in housing
assets

Source: Field survey (2016)



Source: Field survey (2016)

Figure 2.
Respondents access to
electricity facilities

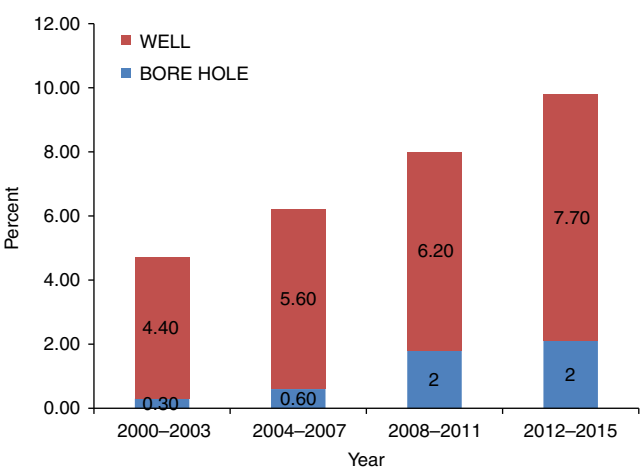


Source: Field survey (2016)

Figure 3.
Respondents access to
toilet facilities

In addition, result in Figure 2 shows that respondents that are connected to Power Holding Company of Nigeria (PHCN) are more than those that are using generators. The trend is 9.1 and 0.3 percent respondents for PHCN and generator, respectively, in years 2000–2003, 9.4 and 0.6 percent respondents for PHCN and generator in 2004–2007, 13.8 and 1.5 percent respondents in 2008–2011 and 16.8 and 2.7 percent in 2012–2015. It implies that greater number villagers that used electricity depend on PHCN than those that uses a generator to augment PHCN power supply and those that depend solely on generator. Also an increase acquisition of generator in the period 2012–2015 either due to poor power supply from PHCN or no connectivity of some communities to the national grid could be as a result of increase in participants' purchasing power after the RUDEP intervention.

According to the result in Figure 3, trend in toilet facilities for the period 2000–2003 is 5.6 percent, 0.3 and 2.7 percent for pit toilet, semi-pit toilet and water closet. The trend for the



Source: Field survey (2016)

Figure 4.
Respondents access to
water facilities

period 2004–2007 is 5.9 percent for pit toilet, semi-pit toilet 0 percent and water closet 1.8 percent. For the period 2008–2011, toilet facilities for the pit toilet is 10.9 percent, semi-pit toilet 0 percent and water closet 2.1 percent, whereas for the period 2012–2015, pit toilet have 11 percent respondents, semi-pit toilet 0.6 percent and 2.7 percent for water closet. There is an upward trend for pit toilet and water closet during the period studied. However, no respondent has access to semi-pit toilet in the period 2004–2011 only 0.3 and 0.6 has access to semi-pit in the period 2000–2003 and 2012–2015. The implication is that more of the respondents use pit toilet than water closet and semi-pit toilet. It could also be inferred that there is increase in number of respondents with toilet facilities (especially pit toilet) after the intervention.

Figure 4 reveals that respondents having access to well water is 4.4 and 0.3 percent for borehole at the beginning within the period 2000–2003, and there is an upward trend of 5.6 and 0.6 percent for both well water and borehole for the period 2003–2007, slight increase in trend to 6.2 and 2 percent from 2008 to 2011 and an increase trend to 7.7 and 2 percent for both well water and borehole for the period 2012–2015. It implies that greater numbers of the respondents were able to provide well water than they could for borehole after the intervention. In addition, the notable increase in the number of well after the intervention might be due to increased income from the combination of additional activities such as apiculture, fisheries among others introduced to the respondents by RUDEP. Also during the field work, it was discovered that some respondents were either re-digging blocked wells or constructing new ones in the study area. The investment in housing facilities such as toilet, water and power supplies by participants of the RUDEP-integrated scheme is in tandem with the DFID (2015) opinion that increased income is usually spent on shelter, water and power supplies (Table V).

An analysis of the correlation analysis shows that both the livelihood assets ($r = 0.451$) and household size ($r = 0.327$) are significantly correlated positively with the housing condition at $p \leq 0.01$. This implies that the higher the household size and the more the livelihood assets acquired by respondents, the better the housing condition. The coefficient of determination (r^2) explains that 10.7 percent of the variation in housing condition is accounted for by household size while livelihood assets accounted for 20.3 percent of the variation in housing condition. Hence, an integrated scheme has the potential to improve rural housing condition. This is in consonance with Morse *et al.* (2009) that large HH size in

Table V.
Result of
correlation analysis

	Age	Household size	Total revenue	Livelihood asset	Housing condition
Pearson correlation	1	0.259**	-0.091	-0.021	0.092
Sig. (2-tailed)		0.000	0.203	0.770	0.200
<i>n</i>	197	189	197	197	197
Pearson correlation	0.259**	1	0.042	0.217**	0.327**
Sig. (2-tailed)	0.000		0.565	0.003	0.000
<i>n</i>	189	191	191	191	191
Pearson correlation	-0.091	0.042	1	0.462**	0.129
Sig. (2-tailed)	0.203	0.565		0.000	0.068
<i>n</i>	197	191	200	200	200
Pearson correlation	-0.021	0.217**	0.462**	1	0.451**
Sig. (2-tailed)	0.770	0.003	0.000		0.000
<i>n</i>	197	191	200	200	200
Pearson correlation	0.092	0.327**	0.129	0.451**	1
Sig. (2-tailed)	0.200	0.000	0.068	0.000	
<i>n</i>	197	191	200	200	200

Note: **Significant at $p \leq 0.01$ level

which most of the members are in working age can lead to increase capacity of the HH to generate higher income than family with small household (HH) size:

$$Y = a + bX_1 + bX_2,$$

where Y is the housing condition; a is the regression constant; b is the regression coefficient of livelihood asset; X_1 is the change in household size; and X_2 is the change in livelihood asset:

$$Y = 2.372 + 0.240(X_1) + 0.403(X_2).$$

The variables that correlated with housing condition i.e. household size and livelihood assets were further subjected to regression analysis. Results in Table VI showed that both household size and livelihood assets were statistically significant predictors. The correlation coefficient (R) value for the regression was 0.512 indicating that a moderate association exists among the household size, livelihood assets and housing condition. The R^2 -value was 0.262 and adjusted R^2 value was 0.254 which means that the regression model accounted for 25.4 percent variation in housing condition. The F -value was 33.374 and was significant at $p \leq 0.01$ which means that the variable explained by the regression model was not due to chance but due to increase in livelihood assets and HH size.

The β coefficient for the household size is 0.240 at $p \leq 0.01$, whereas that of livelihood assets was 0.403 at $p \leq 0.01$. This indicates that rural dwellers with larger household size and more livelihood assets have better housing condition. The results in correlation and regression analysis tallies with finding of Majale (2004) that an integrated approach to urban housing development most certainly has significant potential on improving housing

Table VI.
Coefficient of
multiple regression

	<i>B</i>	SE	β	<i>t</i>
Constant	2.372	0.820		2.891
Household size	0.165	0.044	0.240	3.737
Livelihood asset	0.155	0.025	0.403	6.283

Notes: R -value = 0.512; R^2 -value = 0.262; Adjusted R^2 = 0.254; F -value = 33.374 at $p \leq 0.01$. **Significant at $p \leq 0.01$ level

condition in Kenya. It is also in tandem with the experiences of the action research in Alwar India that established that increase in income of the poor generates significant investments in housing (Lall and Lall, 2006).

5. Conclusion/recommendation

This paper evaluates the impact of RUDEP-integrated scheme on livelihood of 344 selected participants from 28 rural communities in Osun state, Nigeria. The findings reveal some unexpected outcomes of the scheme as in the case with integrated schemes. This is in consonance with Ashley and Hussein (2000) that there are expected and unexpected outcomes in integrated schemes. The RUDEP-integrated scheme initiated by JDPMC is initially focus on improving livelihood of participants that is the expected outcome. The unexpected outcome is improvement in rural housing condition which the current study examined. The study found that integrated scheme had contributed positively to the livelihood of the respondents in terms of educating farmers on best farming practices such as in Yusuf (2010). It also provided a more accessible source of finance than any other available finance source options, increased in assets and skill acquisition and ability to have more combination of livelihood options as a result of the intervention. The number of respondents without personal accommodation also decreased at a significant proportion after the intervention. This is similar to the findings of Majale (2004) and Lall and Lall (2006) which can be attributed to an increase in income with positive spillover effect on housing investment. The finding also confirms the Department for International Development (2015) opinion that increased income is spent on shelter.

Moreover, notable numbers of respondents have increased access to domestic housing facilities such as, well, pit toilet and electricity. The paper, therefore, is of the opinion that, integrated scheme could be used as a self-financing strategy for both qualitative and quantitative improvement of rural housing in Nigeria if the scheme enjoys the requisite government support in terms of adequacy of finance and more government agency participation for wider coverage needed to make impacts of integrated scheme notable. It is also pertinent for religious and social organization to contribute their quota to the advancement of rural dwellers' well-being through integrated scheme. Government in like manner should encourage such initiative by given award to organization or association that has contributed immensely to the advancement of rural community. Through this, the rural community will develop and the economic based of the area will be enhanced.

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Appendix 1

S. No.	Administrative Zone	Farmers Group/ Communities	Number of participants	Number selected (80 percent)
1	Atakumosa	Ifewara	26	21
		Iganga	7	6
		Iwara	7	6
		Iyinta	12	10
		Olowu	9	7
		Ajumobi Igangan	10	8
		Oke-Agbede	18	14
2	Ijesha	Iwaraja	11	9
		Asaobi	10	8
		Ido-Ayegunle	8	6
		Ila-Ijesha	16	13
		Epe	12	10
3	Ila	Idi-Odan	40	32
		Abalagemo	10	8
		Oke-Ila	10	8
		Aiyetoro Ominla	15	12
		Oyi-Ayegun	36	29
		Oyi-Araromi	5	4
		Ijabe	11	9
4	Osogbo	Abaolota	9	7
		Abaolode	20	16
		Awosun	27	22
		Adejuwon	30	24
		Elewure	13	10
		Owode	16	13
		Oyan	15	12
		Idominasi	7	6
		Imesi-Ile	17	14
		Total	427	344

Table AI.
Distribution of
respondents by
location

Source: Field survey (2016)

Appendix 2

Impacts of
integrated
scheme on
livelihood

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Variable	Frequency	Percentage
<i>Household status</i>		
Household head	273	80.3
Not household head	65	19.1
No response	2	0.6
<i>Duration of habitation (years)</i>		
1–5	18	5.2
6–10	8	2.4
11–15	14	4
16–20	66	19.4
25 and above	234	69
<i>Age</i>		
< 40	92	27
41–60	150	44.1
61–80	85	25 Mean = 52.64
81 and above	9	2.7 SD = 15.5
No response	4	1.2
<i>Nativity</i>		
Native	173	51
Non-native	160	47
No response	7	2
<i>Size of land cultivated in hectares</i>		
< 1	29	8.5
2–5	162	47.6
6–10	54	16 Mean = 8.07
11 and above	63	18.5 SD = 10.24
No response	32	9.4
<i>Structure of land ownership</i>		
Family	185	54.4 n = 298
Long lease	73	21.5 Foot note: multiple choices
Outright purchase	31	9
Tribute basis	2	0.6
Installment	7	2
<i>Years of farming experience</i>		
1–10	65	19.1
11–20	71	20.9
21–30	88	25.9 Mean = 2.68
Above 31	99	29.1 SD = 1.11
No response	17	5
<i>Annual income</i>		
< 10,000	173	51
10,001–100,000	87	25.5
100,001–1,000,000	29	8.5
1,000,000 and above	24	7.1
No response	27	7.9

(continued)

Table AII.
Distribution of
respondents by socio-
economic
characteristics

WJSTSD
17,2

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Table AII.

Variable	Frequency	Percentage
<i>Level of education</i>		
No formal education	75	22.1
Adult education	9	2.6
Primary education	88	25.9
Secondary education	117	34.4
Tertiary education	39	11.5
No response	12	3.5

Source: Field survey (2016)

Corresponding author

Adedayo Ayodeji Odebode can be contacted at: adedayoayodeji@yahoo.com

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