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PARTICIPATORY STRATEGIC APPROACH TO DEVELOPMENT OF IMPROVED INDIGENOUS POULTRY SYSTEMS IN EAST AFRICA

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ABSTRACT: *An on-farm farmer participatory research project was carried out in Kenya to improve the management of indigenous chicken and their productivity at farm level, in five different agro-ecological zones. This paper details the research methodology used and highlights some experiences and lessons learnt. The major objectives of the on-farm research were; to improve management and productivity of indigenous chicken at farm level, to change attitudes towards indigenous chicken, to improve farmers capacity and ability to carry out research (involve them in design, implementation and monitoring activities) using local resources and, to exploit the potential of indigenous chickens to contribute to poverty alleviation among rural landless people mainly women. The research project was carried out in five different agro-ecological regions. In each region, four clusters (each cluster from a different village) were selected comprising of ten farmers each. This was followed by farmer training workshops that were held at cluster level. Implementation of a variety of improved management practices was done largely by use of local resources and farmers participation. Monitoring and evaluation were done continuously by farmers and on a regular basis by the research team. Over five hundred farmers were trained on improved management practices for indigenous chicken production, a figure higher than 2-fold the anticipated target. An important achievement was made in the way of creation and enhancement of social capital by bringing together individual farmers and the research team to interact freely and share information, knowledge and experiences. Mutual trust, interest and enthusiasm were generated and were instrumental in the subsequent implementation of the project. Farmers were able to implement a variety of interventions from a basket of options, at their own pace and, with their own locally available resources. Formation of farmer groups (clusters) was a big boon in securing some limited external inputs such as roofing materials and vaccines through joint efforts (harambee). This paper demonstrates and emphasises that involvement of beneficiaries in anti-poverty initiatives, is an imperative if the objectives are to be achieved.*

KEYWORDS: Participatory Development, Indigenous Poultry, East Africa

INTRODUCTION

With more than 1200 million people or one in five of the world's population living in absolute poverty, condemned to short lives stunted by malnutrition, ill-health, and illiteracy, the world's attention is now focused on eliminating poverty with a general acceptance of the fact that it is in every one's interests to eliminate poverty (Blair, 2000; Wolfensohn, 2000; Al-Sultan, 2001). Accordingly, mass poverty hurts not only the poor but claims everyone as its victims. Problems such as war and conflict, international crime and trade in illicit drugs and the spread of health pandemics like HIV/AIDS are caused or exacerbated by poverty. It is heartening therefore that the world community seems now more than ever, fully committed to fight poverty in all its manifestations and to bring down the number of people living in absolute indigence in the coming years. But, as the world community only now begins to turn its attention to the needs of the poor in a more focused and serious manner, this paper will show that we had already embarked on the path for tackling poverty through our research process.

Proper harnessing of local resources of the poor people and their involvement in the research process can help bring about development of sustainable livelihoods and contribute to the fight on poverty alleviation in rural areas where the majority of the poor live(Ndegwa, 2013; Gonsalves et al., 2005). Their number is mainly composed of women (Blair, 2000; Al-Sultan, 2001) who engage in subsistence agricultural activities as they struggle to survive and feed their families under often very hostile environments (Ndegwa et al., 2000, 1999, 1997; Gueye, 2000a).

Marilee (2000), has noted that participation can take many different forms at different stages of a project cycle ranging from contribution of inputs in predetermined projects and programmes, to information sharing, consultation, decision-making, partnership and empowerment. Participation as a means, is a process in which people and communities cooperate and collaborate in development projects and programmes while as an end, it is a process that empowers people and communities through acquiring skills, knowledge and experience, leading to greater self-reliance and self-management. Marilee (2000) also offers some common objectives and expected benefits of participation in development for example improving efficiency, effectiveness, sustainability and coverage of projects and programmes and promoting stakeholder capacity, self-reliance and empowerment. According to Adato et al. (1999), community participation in projects also offers prospects of lowering the costs of anti-poverty interventions.

Gonsalves, *et al.,* (2005) write about new challenges to agricultural research and development that include shifting focus to less favourable environments, strengthening capacity of local farming communities to continuously learn and experiment ways of improving their agricultural livelihoods, research and development are no longer exclusive domain of scientist and that local stakeholders provide inputs to processes that find sustainable solutions.

Farmer participatory research (FPR) is a new scientific perspective that has recently been developed and which, according to Okali and colleagues (1994) can be described in its simplest form as the involvement of farmers in a process of agricultural research. According to Sutherland (1998), the FPR approach developed out of a realisation by development practitioners from the mid 1980s that, the then popular farming system research (FSR) approach, was not effective in achieving desired objectives. FSR was viewed as being too linear and prescriptive, both by academics and also by non-governmental organisations (NGOs) involved in developing and testing new technology. Okali and colleagues (1994), state that FPR placed particular emphasis on farmer participation and incorporated ideas from related approaches such as participatory technology development (PTD), participatory rural appraisal (PRA) and low external input agriculture (LEIA). Farrington (1997) however, suggests that an FSR-type approach may work well for resource-endowed farmers in higher potential areas. FPR in contrast, would be more appropriate for resource poorer farmers in more marginal areas. Sutherland (1998) cautions not to confuse FPR with PRA. PRA describes an empowerment-oriented development appraisal with emphasis on participatory appraisal- i.e. one that is initiated by an external multidisciplinary team, using qualitative research methods, in order to help a local community conduct an efficient assessment of its own situation, including problems and potential. FPR emphasis and focus is on cost-effective technologies, sustainability, indigenous knowledge, local resources and institutional support among others. It hence calls for radical changes that demand reversal of normal and expected roles on the part of outsiders. IFAD (2001), in its rural poverty report, reinforces the need for greater participation, especially of the poor, in deciding which technology to use otherwise they are unlikely to benefit from it.

There is however, little published peer-reviewed material regarding how benefits of participatory research are achieved in practice (Blackstock *et al*., 2007). This paper explores and explains importance of participatory research in practical terms.

The study falls within the approach of farmer participatory research through involvement of farmers in various stages of the research process. Inspiration to adopt the FPR approach was fuelled by a realisation of the shortcomings of past on-farm FSR-based projects, in addressing farmers needs more effectively and for being dominated by researchers. In our case, farmers' own resources and knowledge were an integral component of the process. In this respect, the project aimed at involvement of farmers in the research process to improve management and productivity of indigenous chicken. This, we hoped would lead to an improvement of the living conditions of poor people in rural areas majority of whom are women, and to greater self-esteem and self-reliance by these category of people.

Indigenous chicken are kept and reared by over 90% of rural households, usually in small flocks of about 20 birds (Ndegwa et. al., 2013; 2012; 2006; 2005; 2002; 2001a; 1999; Mbugua, 1990; MoLD, 1990; Stotz, 1983) and, according to Gueye (2000a), more than 80% of the total poultry population in Africa is kept in rural areas. The birds, not only offer an opportunity for making best uses of available natural resources, but represent an appropriate system to supply the fast growing human population with better nutrition and provide additional income to resource and dollar-poor landless farmers (Gueye, 2000b; FAO 1987, 1982). Setioko, (1997) and Ramm et al. (1984), have shown that these birds are an important

source of cash income to families in Asia, while Rauen et al. (1990), has indicated a similar case for Latin America. Chickens are usually regarded as a woman's domain and hence have always had a low status (Ndegwa and Kimani, 1997; Ndegwa et. al., 1998a). This situation, however, should offer an opportunity to support the rural poor women to harness a resource available and accessible to majority of them and which they have a better chance for control, to improve their lot.

The on-farm farmer participatory research followed the on-station studies, stakeholder workshops, field visits and survey (Ndegwa et al.,2013; 2012; 2006; 2005; 2002; 2001a; 2000, 1999, 1998b, 1994; Mbugua et al., 1994). The on-station studies involved characterisation of the production performance of indigenous chickens under improved management. The stakeholder workshops aimed at having a better understanding of the status of poultry production and setting priority for research. The field visits and survey were carried out to bring about a deeper understanding of perceptions among other stakeholders and the farmers' practices and constraints. These activities were instrumental in changing attitudes of many least of all researchers as to the importance of indigenous chickens and the need to have farmers fully participate in various research activities. Knowledge and experience from a variety of stakeholders informed decisions prior to commencement of the on-farm FPR. The stakeholders were drawn from among others various government departments, non-profit organisations, academic institutions and individual farmers. Hence a wide spectrum of stakeholders were involved in one way or the other.

The major objectives of the on-farm research were:

- To enhance farmers' knowledge in improved management of indigenous poultry.
- To create confidence among farmers and other stakeholders for indigenous poultry systems.
- To enhance capacity and ability of farmers to engage in research and project activities.
- To improve productivity within indigenous poultry systems.
- To enhance livelihoods of the poor especially women farmers

These objectives were to be realised through a number of actions and undertakings described in the next section on methodology.

METHODOLOGICAL APPROACH

The approach used in this study is described below but also summarised in figure 2. It involved:

- Selection of locations – 5 regions in different Agro-Ecological Zones and 4 clusters per region. Each cluster has ten farmers and were based on land size as well as aezs criteria
- Farmer selection – along a transect in the cluster area and systematically sampled during baseline studies. Main criteria, was willingness of the farmers to participate and carry out set out activities and have at least a couple of indigenous chicken.
- Emphasis on use of farmer's own locally available resources and mobilisation of farmers in acquiring some external inputs jointly.
- Training seminars – done per clusters in farmers' localities.

- Design and plan of the experimentation was left for individual farmers to decide and to choose.
- Implementation of the research activities was entirely left to the farmers to decide which intervention/s to take up among the options available.
- Monitoring and evaluation – daily by farmers taking of records and periodically by extension and researchers' visits to individual farms.
- Reporting and dissemination – periodic reports. Publications and extension leaflets and manual.

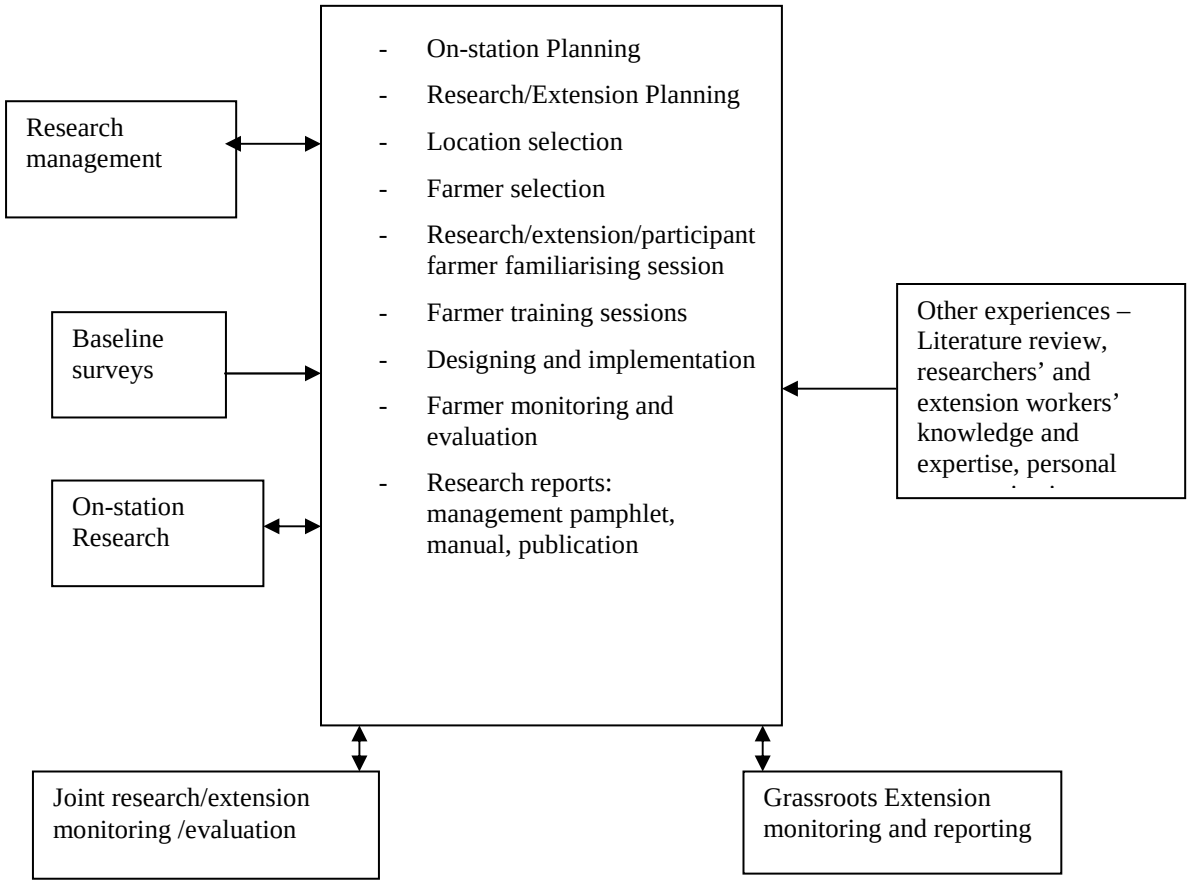

Figure 1. On-farm participatory research process methodology
Adapted from Ndegwa et al., 2000

Location:
This study was carried out in five regions differentiated largely by agro-ecological zones. Subsequently, in each region, four clusters or villages were selected based on such features as agro-ecological zones land size and holdings, and infrastructure. Ten farmers were selected per village and formed the participant group for the village. The project location cut across two provinces, Rift Valley and Central, and three districts Nakuru, Nyandarua and Laikipia. The study sites were thus:

Bahati region – high potential with adequate rainfall and good soils for agricultural activities, with land size ranging from 5 to 0.25 acres per household and relatively good road network and market opportunities. The farmer clusters in Bahati, included villages of Munanda (2 acres holdings), Kabazi (1.5 acres), Scheme (3 acres) and Wanyororo (0.5 acres).

Njoro region – has high to medium potential with good to poor road network and market opportunities. Included villages of Njokerio (0.25 acres), Gichobo (5 acres), Piave (2.5 acres) and Likia (1.5 acres).

Naivasha region – has low potential, porous volcanic soils of high infiltration. Good to poor road network especially during rainy season and included villages of Karate (1.5 acres), Maraigushu (2.5 acres), Karai (5 acres) and Mirera (1 acres).

Ol Kalou region – low to high potential and cold with frequent frost and water logging incidences. Has impassable road network during rainy seasons. Included villages of Ol Kalou South (2.5 acres), Passenga (5 acres), Mirangine (2 acres) and Kaibaga (1 acre).

Ngarua Region – low potential semi-arid, poor infrastructure and frequent livestock theft incidences. Included villages of Kinamba (2 acres), Sipili (2.5 acres), Cheleta (10 acres) and Ol Moran (1 acre).

Farmer participation

The project was based on the willingness of individual farmers to get involved. This was determined in a prior survey carried out to characterise rural poultry production in the study area (Ndegwa et al., 1999). Farmer participation and organisation as well as the attention to local resources aimed at affording sustainability of the process leading to livelihood improvement. Creation of ownership of the process among the farmers and extension workers was a priority and was done through a series of sensitisation and planning meetings. The research strategies for active farmer participation and use of locally available resources were explored and mutually accepted by the farmers and research team.

Figure 2. A sensitisation and planning meeting with farmers and extension workers.

Farmer training and Knowledge sharing

Farmer sensitisation seminars and information exchange preceded implementation of interventions The exercise as depicted in figure 3 below, focused on improved management practices and adaptability of various interventions according to individual farmer's ability. It

was carried out in the villages at locations selected by farmers and local extension agents, but usually on one of the participant farmer's homestead.

Figure 3 A training and knowledge sharing session at a farmer's homestead.

The improved management practices involved feeding, housing, health, hatching and brooding and aimed at overcoming constraints that hinder productivity of indigenous chicken. Farmers were introduced to formal knowledge on each of the topics and ways were explored on the best mode of implementation of the project. The design was such that each farmer would be able to implement by adapting technologies to fit with his or her resource restrictions while realising the benefits of improved productivity.

Information on local remedies for chicken diseases used by farmers and other type of farmers' knowledge was established and shared freely with other not previously aware of such knowledge. Such vital 'indigenous knowledge' was incorporated in the project as one of the options of interventions and many farmers adopted it.

For feeding, farmers were informed of its importance and relevance, the aim being to meet requirement of the birds for protein, energy and other nutrients (vitamin and minerals) necessary for efficient production. The farmers could manage this using a variety of local ingredients including cereal grains, sunflower seeds, grain and vegetative part amaranth, potatoes and their peelings (boiled), household waste, vegetables (cabbage, kale, pumpkins, carrots, tomatoes), grass and a variety of weeds among others. Special attention was given to the feeding of chicks and was done separate from older birds. Recommendation was made for the feed stuff to be placed in feeding troughs or hanging inside the chicken house. Clean and cool water was to be provided at all time.
Housing information focused on its importance in protecting chickens from a variety of hazards including extreme weather, diseases, predators and theft. Important features required in a house would include adequate lighting, ventilation, smooth walls and floor. Any local materials could be used to construct such a house. Again special emphasis was given to the housing of chicks from hatch up to the age of eight weeks when they are most vulnerable.

Health management focused on disease control through a variety of means that included better hygiene, housing chicken in clean houses, vaccination against new castle disease, use of herbs mainly in drinking water, disinfecting chicken houses to kill and control ecto-parasites and deworming.

Hatching and brooding management aimed to increase the flock size by production of own chicks and better rearing. Synchronised and/or consecutive hatching and group brooding of chicks from different batches would provide an opportunity to realise large flock sizes faster and with much ease.

The target for training was mainly the participant farmers especially women but the turn out was far above expectation and adjustments were made to accommodate all who came for the sessions. Close to 500 people (double the number originally anticipated) participated in the training sessions across the study area.

Design and Implementation:
The interventions now available as a basket of options, were taken up by individual participant farmers for adoption and/or adapting at own pace. There were as many variations in the design and implementation as there were participant farmers. The basic aim however, remained that of improving management and enhancing productivity of their flocks as a means to realisation of a better wellbeing.

Figure 4.1. Farmers feeding chicks inside a portable pen

Figure 4.2. Portable chick pen, feeder and watering container

Figure 4.3. Group brooding of chicks from different batches.

Figure 4.4. A chicken house with iron roofing and mud walls

In carrying out the implementation of the interventions, farmers made use of formal knowledge and the indigenous knowledge they already had and that learnt during the training sessions. Figure 4 above depicts some of the adoptions and adaptations the farmers made using a variety of resources available to them.

Use of locally available resources and farmers' ingenuity allowed for implementation of many interventions. The need to work as a group to access external inputs like iron roofing sheets and vaccines had been explored and appreciated as a credible option during consultation and training sessions, an approach which a number of clusters were able to apply and found useful.

Monitoring and Evaluation:

This process also took a participatory approach and comprised of a number of activities carried out by farmers, extension workers and researchers individually and jointly with the others. Individual participant farmers were responsible for the day to day monitoring of their flocks in terms of production characteristics (eggs laid, addition and reduction to flock size, feeding, health) and utilisation characteristics (sales, consumption, gifts). The local extension workers regularly visited their respective cluster farmers at their homes to guide and assess the progress made in terms of implementation of interventions. They would then relay such information to the researchers. The extension workers were also responsible for organising farmers to jointly purchase those external inputs not affordable by individual farmers as well as being the bridge between farmers and researchers. The researchers and extension workers jointly visited the farmers on quarterly basis to monitor and evaluate progress while at the same time reacting to farmers' concerns (Figure 5). The team also validated farmers' records and collected extra data for archiving and analysis.

Figure 5.1. A farmer feeds her chicken as research team looks on.

Figure 5.2. Laying nests with eggs ready for collection

The visits by research team to the farms and information obtained as a result made the basis for evaluation reports. An assessment of these reports by a committee of scientists constituted by organisers of fifth Kenya Agricultural Research Institute's Biennial Scientific conference, praised the project for its "originality" and "novelty" (KARI, 1999) and subsequently ranked it third among 37 projects evaluated from 17 KARI centres.

Discussion:

As pointed out earlier, the research process was set up in such a way as to allow poor farmers create and accumulate capital assets for their fight against poverty, by their being actively involved in the research process. Groups or cluster formation aimed at effective and efficient interaction and learning between the farmers and research team and among individual farmers themselves. In so doing, it was hoped mutual trust and teamwork would be established thereby enhancing the stock of their social capital. Targeting women was a means to empower them to acquire specific skills and derive direct benefit from the research process. Training was a capacity building process for effective participation in project implementation by the farmers. Physical assets for carrying out the project were to be accessed more easily through joint group purchase of those inputs individual farmers would not easily afford on their own. This was done through a method popular with poor women called 'the merry go round' in which the group provides a specific item in turn to each member from the contributions made by all.

Lessons and experiences

- Participation of stakeholders especially the farmers in a project makes it possible for a wide coverage within short time periods and can reduce operational costs. The participant farmers and the local extension workers were able to carry out a number of activities such as recording and organising for vaccination, that would otherwise have required involvement of the researchers. This helped reduce costs and time to complete the project with limited resources.

- Active involvement of stakeholders in a development activity builds trust and generates enthusiasm. It also instils confidence especially among farmers who are able to carry out project activities within the limits of their abilities and understanding. There is also the restoration of pride among the poor farmers for their resources, something necessary for sharing knowledge and experiences. This was borne out by the readiness with which many of them were willing to show to anyone their flock of chickens and to discuss freely the progress they had made with implementing the interventions. A number of the farmers were able to share information with other neighbouring farmers outside the project who then started similar activities to improve management of their birds as we found out in a number of clusters.

- Poor people especially women farmers in rural areas can bring about a change in their deprivation by harnessing local resources available and accessible to them. This lesson is borne out by the fact that one of the project farmers had actually managed, through her personal enthusiasm and determination, to harness indigenous chicken to take her family out of the depth that indigence had condemned them to. The case study is narrated by a development story by Ndegwa (2001). Wanjiku (not her real name) is a single mother of three. Absolutely landless and poor, she and her family sought accommodation in a friend's homestead where they sojourned until their determination and desire to escape their indigence, finally bore fruit. This came about by raising and then selling indigenous chicken. Within a while she had saved enough that enabled her buy a quarter of an acre plot of land where she also put up a dwelling house for her family. Yet in another case, one family among the participant farmers informed us of their strategy to raise funds for the education of their three children in secondary schools. By synchronising hatching and, group brooding and rearing of the chicks for different batches, they managed to sell birds at the age of three to five months, hence raising substantial proportion of the school fees as a result. This category of poor people need to be encouraged and supported to sustain and enhance their development initiatives.

- Training and information sharing can allow the poor people to recognise and take advantage of opportunities to improve their livelihoods. This could also create impetus for sustaining a development project among the clients. Within three months of our farmer training session, one very enthusiastic farmer had adapted hatching and brooding management strategy and had increased the flock size ten-fold. We were able to use his strategy in our advice to other farmers.

- The participatory approach adopted in this project has allowed for sustainability of project activities and creation and enhancement of capital assets among farmers in various groups. Members of a group in Njoro for instance, were found still active and organised in carrying out other activities beyond what they did in our project. They had managed to start keeping and rearing of commercial type layer chicken ranging from 20 to 50 or so birds per farmer which they had jointly purchased as day-old chicks alongside their indigenous chicken flocks though in separate enclosures. This was after the project had been phased out. The same group had expanded its membership from the original ten to twenty five and had formally registered with the government social department.

- Constant interaction of development agents can be an effective means to maintain impetus for a development activity by providing much needed encouragement to the poor farmers who would otherwise feel abandoned if not entirely exploited, by data and information 'gatherers'. In the clusters with enthusiastic local extension workers, farmers' zeal and determination was kept aglow. This was the case with the Njoro group above.

- Female local extension workers tended to be more enthusiastic and effective in organising and encouraging the farmers and most of them joined their clusters as members. This in turn enhanced confidence among their farmers and helped sustain development spirit so far created. This points to a need for a shift in policy towards employment of more women as the development workers at grass-root level. These are more inclined to grasp and understand opportunities available for enhancing the livelihoods of farmers, especially the poor women who in any case form the bulk of agricultural workforce in rural areas.

- Security is an important factor for the success of any development project. Some clusters in our study area were caught up in violent skirmishes in the period around the general elections in 1997. This threatened security of the farmers and in some instances, the situation was so bad farmers abandoned their farms in search of safety elsewhere. For two of the households in our project, it was catastrophic. One household lost the man who was its head and the other lost a school age daughter. But despite the facts, there was a surprise determination by farmers in affected areas to continue with the project activities. Poultry production was more attracting for farmers in such areas, as they were less likely to be targeted for theft.

- Support in form of credit to afford some external inputs timely and with ease, is imperative. This should be delivered through organised farmer groups for those who may wish to have it. This might as well hasten development activities and prevent desperation, loss of hope and determination to escape indigence.

- The participatory research process has made it possible for production of two major publications, one a Ph.D. thesis (J. M. Ndegwa, 2006) and the other, a book on improving production of indigenous chicken (J. M. Ndegwa, 2013). Additionally more publications are in preparation for publication in peer review journals.

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