UPS 8: Poultry-crop integration for enhanced rural income and food security

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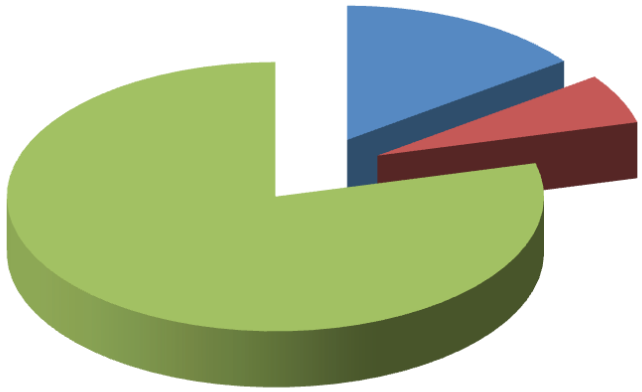
FVC component(s); key constraint addressed

PRODUCTION: Low integration of crop-livestock systems for improved livelihoods. MARKETS: Lack of utilization of by-products from both the livestock and crop sectors produced under integrated livestock-cropping system. WASTE MANAGEMENT: Increased utilization of poultry manure for improving crop production and the use of crop by-products as animal feed.

Description

The need to improve poultry production was identified by farmers themselves as an alternative source of income, especially during harvesting time when the prices of harvested crops are too low. The majority of rural communities regard chickens as "a walking bank" because they are an immediately available source of petty cash in times of need (Moreki and Dikeme, 2011). These chickens are primarily raised under free-range management systems that permit minimum or no care in terms of health, breeding management, housing, and supplemental feed given to the birds (Msami and Young, 2009). The Trans-SEC baseline survey observed that majority of farmers in the study area spend their income from their poultry enterprise on basic-home needs. Very few use the same income to purchase farm inputs or re-invest in poultry and other non-farm activities.



Usage of farmers income (Trans-SEC household survey)

Following the Trans-SEC baseline survey, the knowledge gap and materials needs were identified in order to encourage rural farmers to exploit the potential of poultry-crop integration to improve their income and food security. For the sustainability of this UPS, farmers were trained in poultry management, feed ration formulation, chicks broodiness, and marketing. The main objective of this UPS is to increase household income and nutritional security through the optimized integration of poultry-cropping systems at the household level. Specifically, the project developed different packages to assist farmers with improving traditional poultry management, developing capacity building to farmers regarding utilization of crop by-products in raising poultry, introducing cheap and efficient poultry feeding systems, increasing utilization of poultry manure in crop production, introducing improved local chicken populations that are suitable to the project area and traditional management system.

Proven success in TZ and beyond

Rural poultry improvement projects have been documented (Kitalyi, 1998; Mloziet al.,2003; Kwidika, 2007, Knueppelet al., 2009) with various integration strategies in several regions in Tanzania.

Trans-SEC findings

To realize a pro-poor, efficient, poultry value chain in rural areas, both the traditional poultry management system and market access must be improved. The existing indigenous village chickens were not selected for higher growth rate and egg production (Lyimo et al., 2013). Moreover, the current management system does not offer feed supplements, control of ectoparasites or coccidiosis, vaccination, or proper housing. These individually and collectively lead to higher chicken mortality, poor growth rates, and other economic losses (Mwinuka and Mbaga, 2015).

The initial implementation of poultry-crop integration for enhancing rural income and food security faced challenges in identifying types of birds suitable for the project area and the prevailing markets. The flocks of new chickens with uniform color patterns, faced difficulties in earning good prices. The farmers received a flock of chickens at three weeks of age, with information about management of the chicks, including vaccinations or other treatments. It was found important to consider the ability of the farmers to manage a certain flock size. Based on the observed limitations, the project has adapted this UPS in partnership with the farmers to develop economically and technically viable poultry enterprises.

Type of food crops applicable

The types of resources needed include local chickens, cereals such as maize, wheat and sorghum, crop by-products (maize bran, rice bran, wheat bran, cotton seed cake, sunflower cake), cow pea, cassava, cassava leaves, soya, leucaena, moringa, fish meal, bone meal, and blood meal.

Technical specifics, dimensions

Chickens play a vital role in many poor rural households by providing an important source of high-quality nutrition and income at an affordable investment cost. Village chickens suffer high mortality and low productivity, because people invest little in feeding, housing, and disease prevention (Knueppel et al., 2009). In order to realize the benefits of poultry activity, proper management practices, entrepreneurship, and waste management trainings are required. In addition, vaccination programs and poultry diseases management training is also required.

The poultry-crop integration management system will mainly involve three actors. The chick supplier, brooder, and farmers. The chick supplier provides one-day-old chicks to the brooder who is among the UPS group member. The brooder raises the one-day-old chicks until they are three weeks of age, before selling the chicks to the farmers. The brooder has received training in the management, vaccination programs, poultry feed formulation, and record keeping of chicks. The farmers, who have received training in poultry husbandry, buy the chicks from the brooder and raise them to market level and consumption.


Hydroponic sprouts

Initially, the project supplied, on credit, three-weeks chicks originating from crossing the Malawian breed (Black Australop) with local chicken. The six farmers receiving these chicks faced a marketing problem as the chicks had a uniform black color; something regarded as exotic in the local market. In these markets, multi-color chickens fetch higher prices than do exotic chickens. Following this challenge, the project opted for the Kuroiler type of chicks. The Kuroiler breed has two advantages: they grow faster and lay more eggs than the indigenous village chickens (Sharma et al., 2015). The hens weigh 2kg and the cocks 3kg by the age of three months. Kuroiler produce between 150-200 eggs per year and lay for a period of two years. The indigenous Tanzanian chickens are usually small, with an average maturity weight of 0.9 to 1.8kg, laying a small number of eggs (80 – 120) per year (Swai et al., 2007).


A flock of Kuroiler chickens


Chicken feed on hydroponic fodder

Kuroilers originate from the Indian sub-continent and have multi-colored plumages with similar color patterns to the indigenous village chickens in Tanzania (Lyimo et al., 2013). Kuroiler birds can thrive well under a free range poultry management system with little supplementation of feed from household and agricultural wastes. However, by incorporating a slightly improved semi-free range technique with supplemented feeding, the birds reach maturity within a short period of time.

One progressive farmer who owned a milling machine was empowered to formulate feed rations using the crop residues and other feed ingredients that are available in the district. The formulated feed included all required nutrients and cut feeding costs by 20% compared to available commercial feeds. This UPS also found the possibility of introducing a Hydroponics Sprout feeding system that can cut feeding costs about 50%. To successfully enhance rural income and food through this UPS, farmers are advised to raise a reasonable number of chickens, keeping in mind their capacity with respect to supplying supplemental feeding and the size of the poultry house.

Implementation constraints

Outbreak of poultry diseases, availability of animal health services, and the willingness of farmers to purchase three weeks old-chicks from the brooder on time. The enterprise faces marketing challenges due to stiff competition from local chickens and exotic broilers.

Linkage to other FVC components

PRODUCTION: Will stimulate production of crops and poultry due to increased use of crop products as feeds and poultry manure as fertilizers. MARKETS: Increased income source diversification due to intercropping as well as the equitable and efficient use of household resources. CONSUMPTION: Will increase consumption of poultry and poultry products. WASTE MANAGEMENT: Increased utilization of crops and animals wastes in poultry production.

Considerations & criteria for UPS outscaling

- Establishing a working network and linkage of farmers with commercial chicks suppliers
- Matching the required minimum conditions at the farm level: affordable proper housing, husbandry, affordable feeding systems, etc.
- Working market linkages with potential end-buyers
- Establishing working linkages to the inputs suppliers/ agro-dealers
- Potential new adopters need to be exposed to best practices and to learn from successful practicing farmers etc.

Key lessons learned

Improved poultry production can be a potential alternative source of immediate income and nutrition.

References

Kitalyi A.J. (1998). Village chicken production system in rural Africa. Household food security and gender issues. FAO Animal Production and Health Paper 142, pp84

Knueppel D., Coppolilo P., Msago A.O., Msoffe P., Muteganga D. and Cardona G. (2009). Improving Poultry Production for Sustainability in the Ruha Landscape, Tanzania. TransLinks Program WCS Report. Wildlife conservation Society. http://pdf.usaid.gov/pdf_docs/PBAAD105.pdf

Kwidika G.M, (2007). Local chicken productivity improvement project for Kikundi Cha Wafugaji Kuku BukerebeVillage :Magu District, Tanzania.

Lyimo C.M., Weigend A., Janßen-Tapken U., Msoffe P.L., Simianer H. and Weigend S. (2013). Assessing the genetic diversity of five Tanzanian chicken ecotypes using molecular tools. South African Journal of Animal Science 43 (4): 499-510.

Mlozi M.R.S., Kakengi A.V.M., Minga U.M., Mtambo A.M. and Olsen J.E. (2003). Marketing of free - range local chickens in Morogoro and Kilosa urban markets, Tanzania. Livestock Research for Rural Development15, (2): 2003

Moreki J.C. and Dekeme R. (2011). Small Livetock, Foof Security, Nutrition Security and HIV/AIDS Mitigation. In Tech. Slarka Krautzeka 83A, Croatia. ISBN: 978-953-3076-665-2

Msami H.M. and Young, M.P. (2009): Newcastle disease control using I-2 vaccine in Tanzania: country report. In: R.G. Alders, P.B. Spradbrow and M.P. Young. eds. (2009). Village chickens, poverty alleviation and the sustainable control of Newcastle disease. Proceedings of an international conference held in Dar es Salaam, Tanzania, 5–7 October 2005. ACIAR Proceedings No. 131, pp 67-73.

Mwinuka L. And Mbaga S.H. (2015). Phase I: Baseline Survey Study and Training summary Report. Trans-SEC

Sharma, J., Xie, J., Boggess, M., Galukande, E., Semambo, D., & Sharma, S. (2015). Higher weight gain by Kuroiler chickens than indigenous chickens raised under scavenging conditions by rural households in Uganda. Livestock Research for Rural Development 27(9):http://www.lrrd.org/lrrd27/9/shar27178.html