

Productivity and Economics of Free Ranging Desi Poultry In Sugarcane Integrated Farming System

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Abstract

A field experiment was conducted at farmers field, Coimbatore during *kharif* 2016 -17 to analyse the productivity and economics of free ranging desi poultry in sugarcane integrated farming system. The popular sugarcane variety Mandya and local breeds of desi poultry were used for this study. Two farming systems *viz.*, Sugarcane alone; Sugarcane + desi poultry (2 hens and 1 rooster for 3 cents) were evaluated under field conditions. The sugarcane + desi poultry recorded higher cane yield than sugarcane under sole crop. The increase in yield under sugarcane + desi bird farming system was negligible when compared to cane yield of sole sugarcane. The treatment combination of sugarcane with desi bird recorded higher gross return, net return and benefit cost ratio through selling of eggs and birds in addition to sugarcane yield.

Key words: Sugarcane, desi poultry, productivity, net return, gross return

Introduction

Livestock sector plays an important role in socio-economic development of rural households. Indian poultry industry has made a tremendous growth during the last 4 decades. Poultry is the foremost developing segment of the agricultural sector in India. Globally, India ranked 3rd in egg production (66.45 billions) and 5th in chicken production (3.6 Mt) in the year 2011-12. This increase in poultry production has enhanced the per capita availability to 55 eggs and 2.4 kg poultry meat per annum (Rawat and Dwivedi, 2015).

Rearing of birds which finds its own food and requires only little care is called 'Free Range Poultry Rearing'. This type of chicken rearing (Desi birds of scavenging poultry) offers potentially one of the easiest and most rapid ways of improving the nutritional and financial status of the resource - poor farmers, whose social and economic standards are generally lower than the urban areas. It is an important source of cash income for the poor rural families, particularly for women (Saleque and Mustafa, 1996). Scavenging (desi)

birds, primarily managed by rural women, contribute as much as 80 per cent of the annual income to households (Anon, 2001).

In many countries, especially in India, scavenging (desi) poultry are ubiquitous, flocks of 6 - 10 birds (or up to 20 where housing is provided) being part of every resource - poor household (Anon, 2001). By proper selection programme, egg production of desi hen could be increased up to 135 eggs per year. Productivity of indigenous chicken breeds may be doubled with improved diets and management conditions. The indigenous chickens have not attained their full production potential due to exposure to risks that influence against their survival and productivity under extensive management conditions. However, the research works under field level on age at sexual maturity, average weight at first egg, average live weight at 28th week and hen day egg production at 52 weeks of age was recorded.

There are many positive factors associated with desi poultry being integrated into cropping enterprises: (i) crops produced on the farm can be used to feed the desi poultry, thus minimizing the importing of outside feed stuffs in desi poultry production; (ii) poultry manure can serve as the primary source of nutrients for crop production, thereby cycling nutrients from the crops through the birds and back out onto the land. Nwajiuba and Nwoke (2000) reported that the obvious advantage of poultry production, large numbers of farmers ventured into the business, mostly for income generation purpose besides meeting the protein needs of the household (Ukwuaba and Inoni, 2011).

Sugarcane is a tall perennial plant growing erect even up to 5 or 6 metres and produce multiple stems. The plant is composed of four principal parts, root system, stalk, leaves and inflorescence. Sugarcane is a C₄ plant having high efficiency in storing solar energy and most efficient converter of solar energy to sucrose. Sugarcane plays a major role in the economy of sugarcane growing areas and, hence, improving sugarcane production will greatly help in economic prosperity of the rural farmers and other stakeholders associated with sugarcane cultivation. There has been tremendous awareness in the area of developing "Sugarcane integrated farming system" and it mainly focusing to manage this system in a way that is economically and environmentally sustainable over the long term.

Introduction of desi poultry in the simultaneous cultivation of crops in the same field is a cropping method, which often results in a more efficient utilization of resources; and a method to reduce problems with weeds, plant pathogens and nutrient losses, is important in the present context of agricultural scenario. The advantage of integration of poultry is obvious. As far as poultry integration in food crop concerned i) It provides the organic manure to the crop, thereby reducing the cost and need for supplementing the chemical fertilizers to some extent, ii) The waste material (shrivelled grains, fallen grains, insects, ants green grass etc.) can be effectively converted into egg and chicken meat for human consumption, iii) the small and marginal farmers are practicing mono cropping system throughout the year and integration of desi poultry as supplement component in the cropping system, the available resources are effectively used by the poultry

and it produce egg and meat, it fetches high price in the market thereby it provides additional income to the farmers.

The importance of poultry to the economy of a developing country and its role in improving nutritional status and income of many smallholders and landless communities has been documented (Creevey, 1991; FAO, 1997). Poultry production is therefore pivotal in the economy of a developing nation like India. However, considering the high level of poverty of majority of the populace, it is obvious that most poultry production can only be practiced on a backyard scale. According to Emokaro and Emokpae (2013), World Food is now relying more and more on animal source and ironically it is facing the dual challenges of sufficiency and safer production.

Hence, the present study was taken up to find out the influence of desi poultry component on the productivity and economics of sugarcane integrated farming system.

Materials and methods

Experiment was conducted in farmer's field, Coimbatore during *Kharif*, 2016-17. Initial soil samples were collected at random prior to the field experiment, pooled and analysed for chemical characteristics. The soil of the experimental field was clay loam in texture belonging to *Typic Haplustalf*. The nutrient status of the initial soil was low in available nitrogen (77 kg ha^{-1}), medium in available phosphorus (20 kg ha^{-1}) and high in available potassium (607 kg ha^{-1}). The soil pH was 8.33 and soil EC 0.68 dSm^{-1} . The experiment was laid out as non replicated trial in two locations. Two farming systems *viz.*, Sugarcane alone; Sugarcane + desi poultry (2 hens and 1 rooster for 3 cents) were evaluated under field conditions. The area allocated for the experimental trial was six cents (242.8 m^2). In this area, three cents (121.40 m^2) was demarked and fenced using shade net. The desi poultry chicks were introduced at 60 days after planting of sugarcane.

Sugarcane variety Mandya was chosen for study. A seed rate of 75,000 two budded setts were used. The setts were planted along the centre of the furrows, accommodating 12 buds / metre length. Well decomposed farm yard manure at the rate of 12.5 t ha^{-1} was applied uniformly over the field before last ploughing. The recommended fertilizer dose followed for sugarcane was $300:100:200 \text{ kg NPK ha}^{-1}$.

Economic analysis

Parameters like cost of cultivation, cost of production, gross and net returns and per day return are to be worked out and expressed as Rs / ha.

Gross return

Gross return is calculated by using yield in crop cultivation and economic products in allied components based on market price and expressed as per unit area or Rs./ha.

Net return

Net return is to be calculated by deducting the cost of cultivation from gross returns as detailed below and presented in Rs / ha.

$$\text{Net return (Rs / ha)} = \text{Gross return (Rs / ha)} - \text{Cost of cultivation (Rs / ha)}$$

Benefit-cost ratio

Benefit-cost ratio is calculated based on gross returns and cost of cultivation.

$$\text{Benefit-cost ratio (B: C ratio)} = \frac{\text{Gross return (Rs / ha)}}{\text{Cost of cultivation (Rs / ha)}}$$

Per day return

Per day return is calculated based on net returns and farming system period.

$$\text{Per day return} = \frac{\text{Net return (Rs / ha)}}{\text{System period}}$$

Economic efficiency (EE)

$$\text{EE} = \frac{\text{Net return in IFS} - \text{Net return in conventional system}}{\text{Net return in conventional system}} \times 100$$

Results and Discussion

Sugarcane was higher in sugarcane + desi poultry (two hens and one rooster for 3 cents) farming (37.2 t acre⁻¹) and sole crop sugarcane yield was 36.8 t acre⁻¹ (Table 1). The sugarcane crop when introduced with desi poultry might have benefited with the poultry litter addition in sugarcane + desi poultry cropping system provided the nutrients which in turn to the crop could have increased the yield. Similar findings reported by Dwivedi *et al.* (2012) are in support of the present result.

The total number of eggs produced from the desi poultry integrated farming system was around 3150 eggs acre⁻¹ year⁻¹ (84 eggs year⁻¹ in 3 cents). The live body weight of desi poultry at harvest of the crop was 3.36 kg from three birds. Total live body weight gain at harvest of the sugarcane was 112 kg acre⁻¹ from 75 hens and 25 roosters. Total income of Rs. 40293 acre⁻¹ year⁻¹ was obtained from the desi poultry birds by selling of eggs and birds. The market price of the desi poultry egg was Rs. 6-7/- and market price of the live body weight of desi poultry was Rs. 230 - 250/-.

Sugarcane along with desi poultry (two hens and one rooster for 3 cents) introduction recorded the highest gross return and net return (Rs.1, 25, 853 and Rs.79, 853 acre⁻¹, respectively) than the treatment of sole sugarcane (Rs. 84, 640 and Rs.46, 640 acre⁻¹, respectively). This might be due to the increased yield

and higher income obtained under desi poultry integration in sugarcane crop. This result is in conformity with the findings of Nmadu *et al.* (2014) and Emokaro *et al.* (2016).

The highest benefit cost ratio was recorded under sugarcane along with desi poultry (1.73) integrated farming system compared to sole sugarcane. The economic efficiency of desi poultry integrated farming system was 71 per cent.

Conclusion

Based on the finding of this experiment, it may be concluded that among the farming systems, sole sugarcane recorded lower yield than desi poultry introduced farming system. The gross return, net return and benefit cost ratio were recorded higher under sugarcane + desi poultry integrated farming system. Desi poultry along with sugarcane production was found to be a profitable and viable farming system in the study area.

Table 1. Productivity of integrated farming system and components

Farming system	Sugar cane yield in 3 cents (t/year)	Sugar cane yield (t/acre/year)	Poultry egg yield in 3 cents (2 hens: 1 rooster) (No/year)	Poultry egg yield (75 hens: 25 rooster) (No/acre/year)	Live body weight gain in 3 cents (3 birds) at harvest (kg/year)	Live body weight gain at harvest (kg/acre/year)	Income from desi poultry for 3 cents (Rs.)	Income from desi poultry (Rs./acre)
Sugarcane alone	1.10	36.8	-	-	-	-	-	-
Sugarcane +Desi poultry	1.14	37.2	84	3150	3.36	112	1210	40293

Table 2. Gross return of integrated farming systems

Particulars	Actual income from sugarcane for 3 cents (Rs.)	Actual income from sugarcane (Rs./acre)	Actual income from desi poultry for 3 cents (Rs.)	Actual income from desi poultry (Rs./acre)	Gross return (acre/year)
Sugarcane alone	2530	84640	-	-	84640
Sugarcane +Desi poultry	2622	85560	1210	40293	125853

Table 3. Economic analysis of integrated farming systems

Farming Systems	Production cost (Rs./ acre)	Gross return (Rs. / acre)	Net return (Rs./acre)	B:C ratio	Per day return (Rs./ acre)	Economic efficiency (%)
Sugarcane alone	38000	84640	46640	1.22	155	71
Sugarcane + Desi poultry	46000	125853	79853	1.73	266	

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