Integrated Farming for Sustainable Agriculture and Livelihood Security to Rural Poor

Jaishankar N, B.S.Janagoudar, Basavaraj Kalmath, Vasudev Palthe Naik, and Siddayya S

Abstract— The field experiment was conducted to study the integrated farming approach over conventional method of agriculture farming. Forty hectare of land was selected for the experimental trial involving twenty five small and marginal farmers at Belagera village, Yadgir local RSK, Karnataka. The initial survey conducted to assess the farming practice and the economics of conventional farming, the data collected, analyzed and the necessary critical inputs supplied based on Integrated farming approach to improve the agricultural farming practice. Trainings were conducted to create awareness regarding efficient use of locally available resource, integrated farming approaches and its benefits. The crop equivalent yield (q/ha), net returns (Rs/ha) and the Benefit:Cost ratio was calculated as per farmers practice and as per integrated farming approach. The data was analyzed using statistical tool ‘Paired student’s t test’. The results shows that the average crop equivalent yield varied significantly P<0.001 from 17.19 q/ha (farmer practice) to 19.38 q/ha (IFS), the average net returns varies significantly P<0.001 from Rs. 63611 (farmer practice) to Rs.71705 (IFS) and the mean Benefit:Cost ratio varies significantly P<0.001 from 1.72 (farmer practice) to 1.94 (IFS). The experiment concludes that integrated farming approach is more economical than conventional method. Hence promotion of integrated farming system benefits to the rural poor for their sustainable livelihood.

Keywords— Integrated farming, Agriculture, Belagera

I. INTRODUCTION

Integrated farming system is the system invariably having combination of crop and animal components. Where, the product and byproduct of one component can be used for other component. Integrated farming and mixed farming benefits more interms of economic returns than the mono crops. The demand for food is increasing day by day due to decreased food production; there is continuous conversion of agricultural lands to residential lands and also the number of farmers working in the field is drastically reduced.

The primary objective of the IFS is to maintain production of food and other goods and services that contribute to food security and income generation to the rural poor. Other functions that are just as important are achieving environmental sustainability and contributing to agriculture sustainability and ecosystem services. This would imply that these systems have components that incorporate the concepts of multifunctionality. Multifunctionality is interpreted in terms of multiple roles assigned to agriculture [4], [11]. In the framework of multifuctionality agriculture as an activity is entrusted with performing four main functions in society, namely, food security and environmental, economic and social functions. In general, increasing the number of functions tends to increase the stability of agriculture and land use [11].

Continuous production of crops without external inputs reduce the ability of the soil resource base to both provide and retain nutrients which often results in a decline in productivity [9], [10]. Integrated farming systems are often viewed as a sustainable alternative to commercial farming systems particularly on marginal lands with the objective of reversing resource degradation and stabilizing farm incomes. [8] Reported that the integration of trees into these systems offer income security and ecological protection. Added to this, the use of diverse plants and animals broadens possible sources of income generation.

Therefore an attempt was made to conduct a trial at field level to improve the agricultural farming with the following objectives: to create awareness among the farmers regarding integrated farming systems, to increase food production with minor and major interventions, to ensure employment and prevent farmers migrating to urban areas and to ensure better economic returns for the livelihood security.

II. MATERIALS AND METHODS

The experiment was conducted at Belagera village, Yadgir district, Karnataka, India, to study the profitability and productivity of integrated farming during the year 2011-12. Twenty five farmers were selected holding the total land of 40 hectare. Out of 40 hectare 69% has irrigated land and 31% has rainfed area. It comprise of main crops like ground nut, green gram and paddy. Initial baseline data was collected upon survey and Interventions were made by College of Agriculture, Bheemarayanagudi, UAS, Raichur under RKVY - IFS Project. The intervention of necessary critical inputs (Horticulture seedlings, Vegetable seeds, Animal components, Biofertilizers, fodder grass, Improved seeds) provided based on integrated farming approach without affecting the main crops.

Training and demonstrations (seed treatment) were done to create awareness among the farmers for integrated farming. Exposure visits to progressive farmer’s field done to motivate the farmers to involve in integrated farming approach and also exposure visits to krishimela organized by UAS Raichur was done to enhance the knowledge regarding the latest

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technologies released by the university. Farmers were educated and directed for plantation of horticulture seedlings like mango, coconut, guava, pomegranate, sapota, lime, curry leaf, Jamun etc., interventions made to produce vegetables like ridge guard, cucumber, cow pea, beans, tomato, brinjal etc. Backyard poultry giriraja/swarnadhara birds was promoted upon providing six weeks old chicks. Farmers are educated regarding the integrated farming and also mixed farming to achieve better returns.

The programme monitored regularly, the crop yield recorded than the crop equivalent yield, the net returns and B:C ratio calculated and this calculated data with initial survey data subjected for statistical analysis (paired students ‘t’ test) for further interpretation.

III. RESULTS AND DISCUSSION

The different crop yield was recorded and the crop equivalent yield was calculated and analyzed statistically using paired student’s t test. The average crop equivalent yield (q/ha) varied significantly from 17.19 (Farmers practice) to 19.38 (IFS), the data was also represented in bar diagram. The increase in the crop production may be due to intervention of gypsum and ZnSo4. Seed treatment with Trichoderma which reduce the incidence of diseases in the seed, enhanced the germination of seed and also increased the productivity, application of farm yard manure, timely application of nutrient sprays and pesticides to control pest attack and also the efficient use of locally available resources for the better returns.

The results were supportive with some of the reviews as Trichoderma species are free-living fungi that are common in soil and root ecosystems. They have been widely studied for their capacity to enhance plant growth, produce antibiotics, parasitize other fungi, and compete with deleterious plant microorganisms [1], [2], [5], [15]. The effectiveness of the use of microorganisms as biofertilisers and biocontrols however, is determined by a myriad of factors including virulence of the isolate, environmental factors, time of application, ability to survive in the environments other than their origin and colonize plants roots during certain period of time to control plant pathogens [7], [13], [14]. Application of trichoderma improves germination of seeds and soil fertility [12].

The increase crop yield may also be due to application of zinc sulphate and gypsum as similar results were reported by [13]. Zinc is one of the important essential micronutrients required for growth, development and yield of most crops especially rice grown in low land conditions. Zinc is an indispensable micronutrient for proper plant growth and development. Application of ZnSo4 and gypsum increased pod yield in groundnut crop. [6].

Even though India has emerged as the fourth and fifth largest producer of eggs and poultry meat, respectively in the world, the per capita availability is just 40 eggs and 1.2 kg poultry meat as against the ICMR recommendations of 180 eggs and 11 kgs of poultry meat. Backyard poultry production system involves no expenditure for chicks, feed and medicine including vaccine. That apart, the backyard rearing is within the reach of an ordinary farmer who with minimal input can manage independently, skillfully and successfully.

A few genetic stocks have been developed recently for promoting rural poultry production and marketed under the names of Giriraja, Vanaraja, Gramapiyi, Krishipriya, Krishna-J, Yamuna, Nanadam, CARI Shyam etc. They have given encouraging results under traditional backyard and semi-intensive system of poultry production with an improved productivity, adaptability and disease resistance. Birds are let out into the field for scavenging during the day time and balanced supplementary feed of about 25-30g/bird/day is provided during night hours.

The Swarnadhara chicks provided to all beneficiaries to create interest for backyard poultry rearing. The bodyweight was increased from 1kg to 3-4kg over a period of six months. These birds were sold for 700 to 800 rupees per bird during festival season. This motivated the farmers and demanded to supply new stock of backyard chicks.

The training programme conducted regarding farming of vegetable crops and supplied improved vegetable seeds, regular field visits done to educate and control of pests in the field upon recommendation of specific pesticides, which added the additional regular income generation from sales of vegetables for the livelihood. The Napier grass fodder blocks were established and educated the farmers regarding the availability of green fodder throughout the year. The average net returns were statistically significant and varies from Rs. 63,611 (Farmers practice) to Rs. 71,705 (IFS). The data represented in bar diagram. The mean B:C ratio varied significantly from 1.72 (Farmers practice) to 1.94 (IFS). The analyzed data represented in bar diagram. The integrated farming especially the animal component and the horticulture components like vegetable and flowers provide income regularly, which helps as an additional income for the livelihood. Other interventions like horticulture seedlings were provided which will be the asset for the future.

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<td><strong>THE CROP EQUIVALENT YIELD (Q/HA), NET RETURNS (RS.) AND B:C RATIO</strong></td>
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REFERENCES

http://dx.doi.org/10.1007/s00248-006-9203-0

http://dx.doi.org/10.1094/PD-70-145


http://dx.doi.org/10.1038/nrmicro797


http://dx.doi.org/10.1007/s10658-005-2083-1

http://dx.doi.org/10.1016/j.soilbio.2007.07.002

http://dx.doi.org/10.1023/A:1011990013955.