

Mr Bairwa's diverse farm

Though the green revolution enabled India to attain food security, the technologies, subsidies and public support systems failed to address the problems of small-scale dryland agriculture. Diversified farming, being more economically and ecologically resilient, can reduce risk. Integrating livestock, growing a variety of crops and recycling farm produce as Mr Bairwa does, reduce the risk in farming. It also makes him less susceptible to price fluctuations.

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Mr Babulal Bairwa is a small-scale farmer who lives in Sajia Village, Gram Panchayat Chanani, Rajasthan (in northern India). He owns about 1.5 ha land where he and his family practise agriculture, horticulture, livestock and poultry raising and have a flour mill. In 1996, the land was almost barren with only a few *babool* trees (*Acacia nelotica*). He cleared and levelled the area and made it suitable for cultivation. He planted about 45 trees along the farm boundary for fodder, fuel, shade and as a wind break. For irrigation and drinking he dug a well. Every other year he adds fertile top soil to the land.

Mr Bairwa has attended various exchange visits to research institutions and farmer's fields. He has also obtained loans for purchasing accessories like hose-pipes, sieves, fencing and a vermicompost unit through CECOEDECON (Centre for Community Economics and Development Consultants Society), a local NGO. This NGO promotes sustainable agriculture practices and organic farming in rural areas of Rajasthan. They emphasise the farmer-led approach and organise exposure visits and trainings for farmers like Mr Bairwa.

Sustainable agricultural practices

As well as having a diverse farm, making the best use of all products within his farm is key to Mr Bairwa's success. During the rainy season, Mr Bairwa grows pearl millet, sorghum, corn, sesame and cowpea. In winter he grows wheat, barley, mustard, and chickpea. He has a small kitchen garden where he grows vegetables, and he has planted about 300 fruit plants of which 275 are well established. He practises intercropping and raises crops in between the fruit plants, but believes that mixed cropping makes harvesting difficult. He purchases seeds of improved varieties which can be used for up to three years. He practises mulching and crop rotation, noticing that crop rotation reduces the incidence of pests and weeds. He finds that mulching reduces soil temperature, increases infiltration and adds organic matter to the soil.

He irrigates the field crops and fruit crops. He can predict a frost and remembers the advantages of irrigation and smoking in reducing the effect of frost. The lower portion of the field is kept fallow during the rainy season. This impounds rain water which improves the soil moisture for growing winter crops, and recharges the ground water.

Mr Bairwa prepares a bio-pesticide by mixing cattle urine with neem, *Dhatura* and *Calotropis* leaves and allowing it to ferment for 15 days. It is later filtered, diluted 10 times and sprayed on plants. According to Mr Bairwa, this keeps down the pest



Photo: CECOEDECON

Mr Bairwa believes that growing a variety of crops can reduce the risk of crop failure, and provide a rich and varied diet.

population and enhances plant growth. If the infestation is severe he resorts to chemical pesticides.

Mr Bairwa owns two buffaloes and two calves. He bought the buffaloes under a government scheme in 2005, when he got a subsidy. He grows lucerne for fodder, and feeds the livestock on green fodder, wheat straw, and oil cakes. The dung is used for manuring trees and preparing vermicompost. He prepares vermicompost in a shed during summer when there are no farm activities. Besides cattle manure, he uses tree leaves, kitchen waste and crop waste to prepare compost. By the rainy season, the compost will be ready and it is applied to crops, after which he uses the same shed for poultry. His buffaloes and poultry are both local breeds.

Farm based enterprises

He gets 10 litres of milk per day from the buffaloes, of which three litres is used in the household. The rest is sold to the dairy co-operative society. He realises that the eggs and meat of local hens fetch higher prices in the market. He applies poultry manure to vegetables and observes that it performs even better than vermicompost. Mr Bairwa also owns a flour mill which is an additional source of income for his family. The waste from the mill is used as a feed for buffaloes. He obtains an average of 1.5 kg of waste per day while cleaning the mill. These are some of the ways he recycles farm produce within his farm. Since labour is not available in the locality his family members assist him in all the farm activities.

Secure livelihoods with diversified farming

Mr Bairwa shows how it is possible for a small farmer to efficiently use his limited resources through diversified farming and make a good profit. By combining livestock with crops, he recycles farm produce. Despite frequent droughts and crop failure in the dry lands of Rajasthan, farmers are able to earn a steady income through livestock. Feeding and marketing are flexible in animal production systems. This can cushion farmers against trade and price fluctuations and, in conjunction with cropping operations, make more efficient use of farm labour.

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