

Success model of Integrated Farming System (IFS) for western Himalayas

An Integrated Farming System (IFS) comprising of water mill, fish farming, poultry, piggery and agriculture is developed in Sainji village of Tehri-Garhwal in Uttarakhand. Water from existing water mill functioning on flow-through water from a local stream was channelized to two cemented water harvesting ponds (100+160 m³) constructed in vertical series (Photo 1-2). Strategic pond construction to let-out subsurface water flow through a covered channel at bottom of the pond reduced water loss significantly to a minimum (Photo 3). Grownup fish seedlings of Indian and exotic major carps weighing between 20-50 gm were stocked in the ponds @ 1-2 fishes/m² for composite carp culture. Bigger size fingerlings register minimum mortality and predation by birds or snakes. A poultry hut (11.6 m²) and pigsty (6.7 m²) were constructed above the ponds, where 100-120 one-day old *Kroiler* chicks (a hardy multipurpose fast growing poultry breed) and one-month old 4 piglets (Large white Yorkshire) were reared.

Leftover from water mills, poultry and pigsty and poultry or pig excreta were used as feeds for fishes or pigs to reduce cost of feeding. Water used for rearing fishes circulated for paddy and vegetable fields through gravity. Initially, 0.2 kg/100 birds/day poultry waste is generated, which increases gradually up to 7 kg during 8th-10th weeks that can be recycled. About 6-7 quintal wet pig dung and wastes are produced annually by 3-4 pigs for recycling as fish feed and fertilizer in fishponds/agriculture crops. It was observed that the IFS has potential to yield 40-50 kg fish/m², 200-250 kg live weight pigs for pork within 6-7 months, 500-650 kg poultry meat and 20-38% additional grain or vegetable yield over and above income received from tradition water mill (Rs. 10,000). Farmers can recover initial investments within a period of 3-4 years with overall B:C ratio of 1.9:1. More than profit, it helps to ensure much needed quality animal protein to supplement dietary needs. Thus, IFS reduced ultimate wastes, economized small-scale farming components and provided good opportunities for food and livelihood security, benefiting resource-poor farmers of the western Himalayas.

Optimum use of available or developed water resources, marginal lands and farming opportunities through integrated approach was incorporated effectively into existing land-use pattern as innovative multi-tier farming for multi-commodities on a common infrastructural base. The system is economically viable for entire mid-Himalayan areas with terraced landscape that receive annual average rainfall of about 1000-1800 mm. The system has been exposed to various stakeholders and 7 new IFS have come up in farmers' fields in the region.



Photo 1. A panoramic view of the system



Photo 2. Sectional views of the system



Photo 3. Strategic pond construction and outlet for subsurface flow