Success story of a project implemented in 4 blocks of Barabanki and Raebareli districts of U.P. India for improving Livelihood Security through Livestock based Farming System

The proposed districts of Barabanki and Raebareli in Uttar Pradesh, India were selected based on their disadvantageous position in the state not only for agriculture but also for poor standard of living for the poor due to limited livelihood opportunities. Lack of crop diversification, poor breeds of animals/birds, farm mechanization, mono-cropping, poor seed replacement rate, terminal water stress and poor marketing infrastructure facilities etc. are some important area to be covered in this project.

The major components of the project taken up include:

a. Intensification and diversification of agricultural activity through integrated farming system approach comprising varietals improvement, seed replacement, farm-based enterprises for self employment etc.
b. Livestock improvement, increasing per unit profitability and integration.
c. Soil health improvement by promoting organic production system, IPM, mass composting, encouraging use of homemade bio-pesticides, bio-fertilizers etc.
d. Human resource development for sustenance of the proposed activities.

Critical gaps:

- Reversing sick soil to healthy soil through low cost approaches in existing penury
- Infertility control (reproductive health management) in livestock, particularly bovines, through non-hormonal and cost effective measures
- Enhancing the availability of well adopted, high producing germplasms
- Reducing the inter-calving period in bovines to 12 to 13 months from the existing range of 24 to 36 months. This will nearly double the milk production and availability of improved germplasms. These gaps exist for other livestock also.
- Standardization of methodologies/approaches for generating gainful rural self-employment through improved agricultural technological interventions. Low cost organic farming practices in the villages

Livelihood Analysis

The survey of proposed two clusters in two districts was conducted to assess the technological gaps, status of agriculture, farming system, livelihood scenario and the technological interventions needed. All the four clusters in the two districts have similar socio-economic penury. The major livelihood systems in the area are agriculture-based and include crop-based, livestock-based and part time rural employment. Migration of youth in search of job is another phenomenon mostly observed. Average land-holding per family is below 1.00ha and majority of SC population is either landless or have very poor holdings.

Crop: Traditionally the farmers are dependent on cultivation of paddy, wheat, pulses (mainly Arhar), oil seeds (mustard) and have densely planted or old mango orchards. In cluster I and II, Mentha cultivation are practiced by few farmers as cash crop. Vegetables are grown only for home consumption or as subsidiary income by few farmers and not at commercial scale. The irrigation source is mini tube wells and mini canal in cluster I and II. The productivity is very poor. Many farmers are not able to afford the high input costs of fertilizers, pesticides and irrigation.

Livestock: Livestock are only grown as subsidiary income source, except by few farmers having herd size (bovine) of 2-5 animals. The animals reared for livelihood are cattle, buffalo and goat.

Poultry units on commercial scale are absent. Some farmers started the venture with government support but found it uneconomical and closed it. The livestock breeds are nondescript and low producing. The average milk production per lactation is 300-500 liters in cattle whereas 450-700 liters in buffaloes. Inter-calving period is very high (average 28.4 months in cattle and 32.6 months in buffaloes). The growth rate in goats is poor and one year body weight (pooled) is around 13 Kg. The green fodder availability is poor and concentrate feeing, even in commercial units, is either not practiced or is inadequate.

Livelihood status: The scenario is comparatively safer in the families having higher land holdings or employment in organized sectors. However, it is highly unsatisfactory with landless or small holder families.

Strength: Traditionally strong agriculture base, equipped with traditional agricultural practices, marginal use of chemical fertilizers and pesticides, comparatively better soil health and mini canals for irrigation.

Weaknesses: Poor landholding, poor productivity, inability to afford high input agricultural production systems and high unemployment rate leading to higher vulnerability and lack of industrial base. Mostly agriculture is rain-fed.

Opportunities: There is good scope for increasing the per-unit productivity of land and livestock. Proximity to big city and national highways and diversification of agriculture (including organic production system) are opportunities in the area.

Threats: Land fragmentation owing to increase in family size will result in dire consequences. Absence of sustainable and profitable livelihood system for lower strata of the society is another threat. Wild monkey and Blue bull (scheduled animals) are major threat to agriculture.

Methodology

Four clusters of 42 villages in two districts are identified to assess the technological gap, status of agriculture, farming system, livelihood scenario and the necessary technological intervention needed. Majority of population in this area is below poverty line. i.e. 47% in Barabanki and 52 % in Raebareli. The livelihood analysis was carried out to identify the contribution of crop production and livestock in the livelihood of mentioned cluster population.

Selection of beneficiary farmers

Based on the results of the stratified sampling survey (baseline survey) the beneficiaries are grouped into landless, small, marginal and large farmers. More emphasis was given to landless small and marginal farmers where the pre-interventions scenario for the proposed technologies was negligible. Apart from this only interested beneficiaries were considered first to go for interventions. There was a doubt among the farmers that whether these people are really to do with agriculture or just come to show them as models.

Along with the land area the criteria of selection were as follows

- Small and landless farmers (75%), big farmers (25%). For big farmers only technology with very little inputs was intervened.
- Family income ranging between rupees 5000 to 30000 were given priority for interventions
- Landless with or without backyard birds and low yielding cows.
- Unemployed youths of the village with land area less than a ha.
- Response and faith on the technologies.
- Social behavior in the village.

Interventions undertaken in the adopted blocks

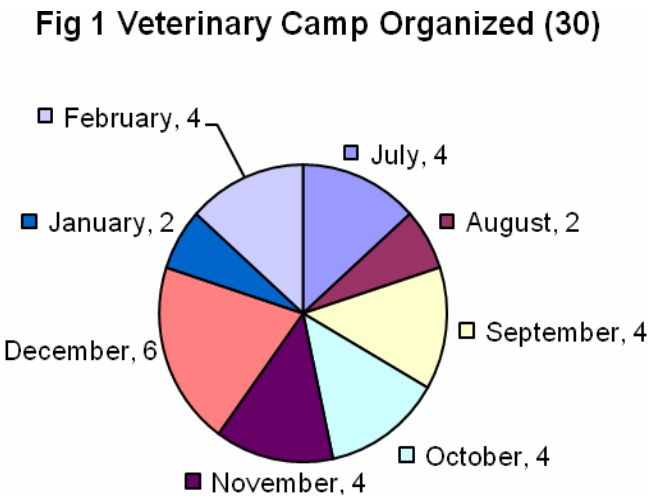
1. Mass infertility control with estrous synchronization, and treatment using low-cost non-hormonal mineral-based technology to reduce inter-calving period for sustainable milk production in the cattle and producing improved calves in mass.
2. Mass vaccination against diseases like FMD, HS, BQ etc.
3. Introduction of high yielding birds suitable for rural poultry farming under scavenging and semi-intensive systems
4. Introduction of high yielding fowl strains suitable for intensive system.
5. Training of the partners/stakeholders regarding scientific methods of poultry rearing.
6. Introduction of azolla *in-situ* cultivation as a supplementation of poultry feed
7. Economic livelihood generation through high performance goat breeds
8. Commercial cultivation of banana with precision farming technologies
9. Economic and nutritional security through establishment of normal and high density systems of guava, mango, aonla and bel in the barren lands.
10. Zero tillage and resource conservation technologies for sustainable wheat production.
11. Agronomical interventions as SRI in paddy to resist draught and increasing profitability.
12. Commercial honey production through bee keeping
13. Commercial production of cut flowers like gladiolus.
14. Intervention of suitable high yielding varieties in vegetables.
15. Establishment on farm production organic inputs model involving traditional knowledge pertaining to organic framing for cultivation of agri horti crops.

Participatory approach through formation of different committees

- The farmers were involved in all the development activities and were motivated to work in groups to share the benefits of the resources generated in the project. Small farmers groups were formed to inculcate the group and social response for them.
- An approach is initiated to form the Farmers Association in Terra village of Raebareli district which was agreed by the farmers. The association will be responsible for sharing of the inputs distributed. They will be linked to the major markets for disposal of their produce like gladiolus, vegetables and banana.

Results

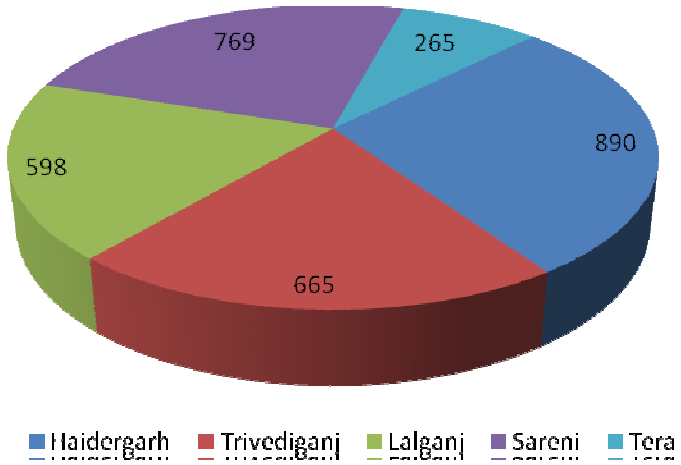
Veterinary and Infertility camp: Infertility accounts major economic losses in livestock. In cattle about 60-70% lactations may be affected by reproductive disorders and infertility. During the period 912 infertility cases were treated with the new technological intervention besides covering the other problems.



Vaccination

Apart from regular health camps the vaccination of the animals for the various diseases like FMD etc were also taken up in the project area. The details are given in Fig 2

Fig. 2 Number of animal vaccinated in the project area



Goat farming

A total number of 150 beneficiaries were supplied with 4 adult female of Shirohi breed in goats at Barabanki district. The goats were examined for various conditions during the camp, dewormed and advised to carry out deworming practices at regular interval for better growth. They are in good health.

Poultry farming

A total of 5,541 chicks were distributed for backyard with poultry medicines and feed supplements to reduce the mortality and promote better growth. Performance evaluation is in

progress. Price of poultry products vary from Rs. 4.00 to 5.00 per egg and live birds from Rs. 250 to 300 per bird. Three commercial poultry units were also established in Haidergarh cluster. A total of 15 commercial poultry units are being waited for chicks' arrival.

Fig 3 Details of backyard poultry birds distributed to the farmers of the project area

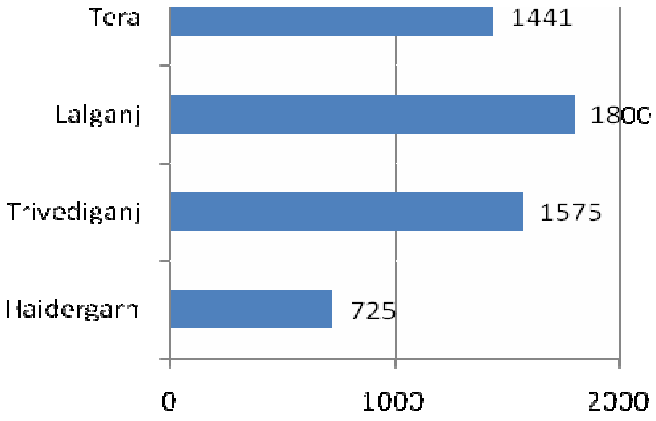
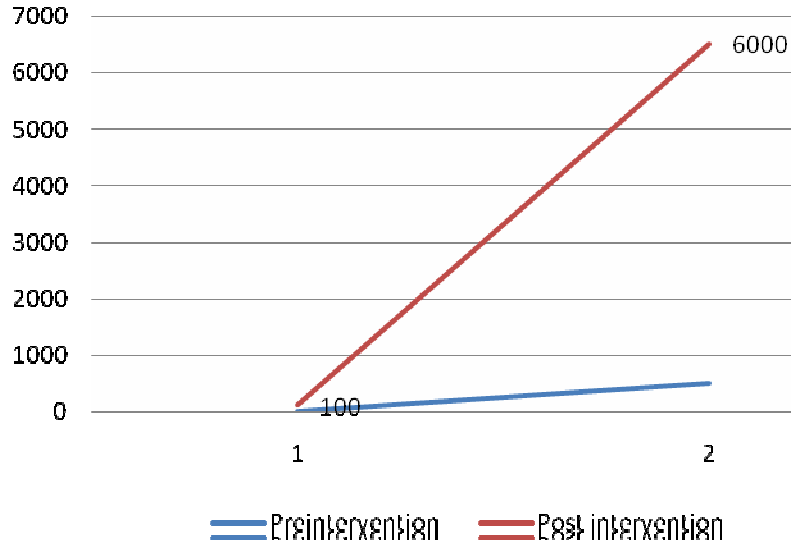


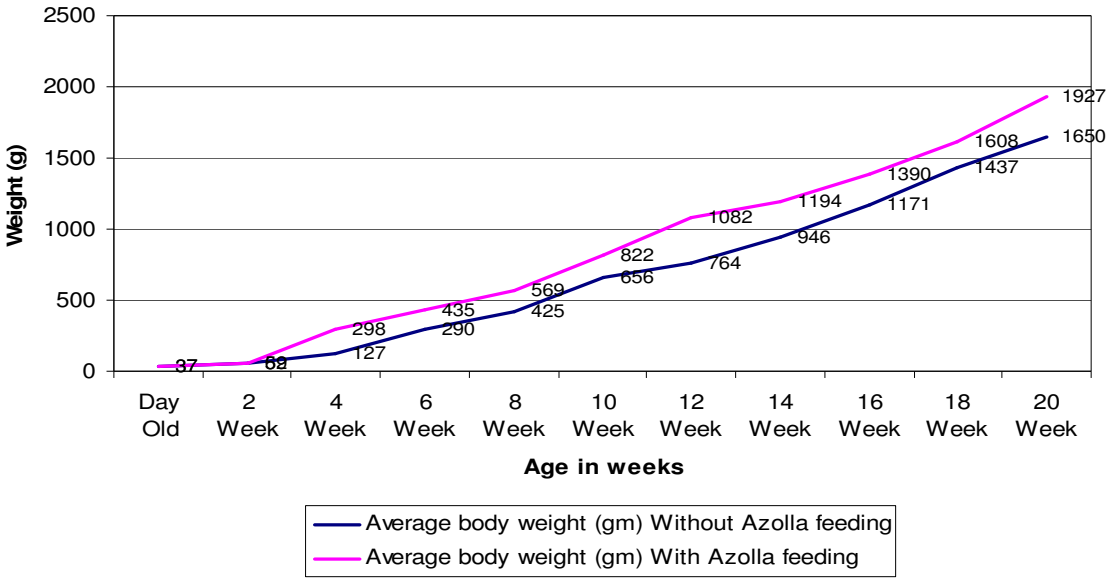
Fig 4 Change in income pattern of the beneficiaries on an average after intervention



Azolla

Azolla is a free floating algae and distributed in tropical and subtropical areas. It is rich source of essential amino acids, vitamins, minerals like- calcium, phosphorus, potassium.etc. It can be used to replace the commercial feed of the poultry. About 53 units of *in-situ* azolla production were made in the adopted clusters where both backyard and commercial poultry has been intervened. The details of the dispersion of technology are given in Fig 5

Fig 5 Impact of azolla nutirition on the body weight of the poultry birds



Commercial horticulture for economic livelihood generation

Several technologies like apiculture, commercial cut flower production, vegetable production and banana cultivation were integrated with the composting technologies and livestock based farming systems for providing economic and nutritional security. A total of 18 honey bee boxes were distributed to the small farmers and they were empowered with necessary training for taking up honey production on commercial scale. This was combined with gladiolus (cut flower) cultivation with the technology know how. A total of 50 beneficiaries were covered under this program. The system generated a income to a tune of Rs.120000/- from the clusters of Barabanki district.

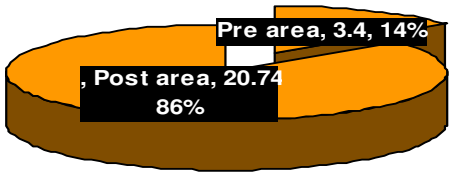
Plantation of fruit crops

About 15,000 grafts of improved varieties of mango (Dashehari, Chausa and Amrapalli) guava (Lalit, Allahabad Safeda, Sweta and Sardar), Aonla (Krishna, Kanchan, Chakaya, Lakshmi-52 and N A -7), Bael (CISH –B1 and B2), banana (Grand naine), citrus (Pant lemon -1)were provided and transplanted in the farmers field for nutritional and economic security.

Vegetables, though conventional methods clusters at limited scale, was found to be not economically viable as a source of income due to high seed and input cost and low production. This was addressed by replacing the traditional varieties with breeder and foundation seeds of released ruling varieties of the agricultural universities and ICAR. Moreover the farmers were being imparted knowledge on seed production of the same to use their own seeds and save the cost of input. Apart from this the fertilizer and pesticide use was minimized by introducing organic farming systems like Biodynamic, Rishi Krishi, Panchgavya and Homa farming.

Fig 6 *Impact of interventions in production and income of the beneficiaries*

Fig 7 Impact of interventions in increase in the area of vegetable production



Training of farmers

Three on-farm and eleven off-farm trainings were conducted on various aspects for capacity building as well as human resource developments.

Field camps

More than 50 field camps on various aspects including IPM, IPNM, IDM livestock diseases etc., were conducted.

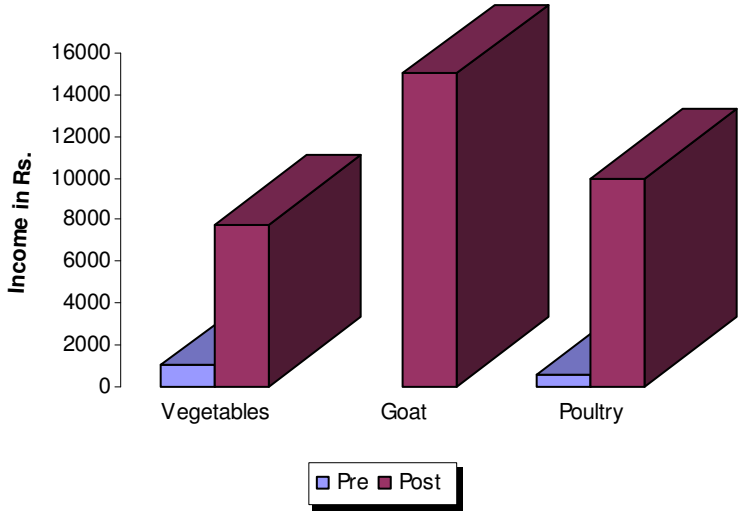
Analysis of feed stuffs for mycotoxins:

A total of 59samples of various feed stuffs were collected from the project area and analyzed for aflatoxin and T-2 toxins. All the samples were positive for aflatoxins and value ranged from 0.58

to 26.50 ppb. However, 5 samples were negative for T-2 toxin and values in positive samples ranged from 33.80 to 500 ppb. The work is in progress covering further seasons.

Success stories and up-scalable technologies

Fig 8 Impact of intervention on income of a farmer (Sh.Majid)



Apart from this the waste land was formed into terraces and planted with guava under high density of 3 x 3 m. The unique feature of the system is apart from introduction of guava the integration of poultry has reduced the incidence of pest in the guava plants and also provided manure for its growth. The production of vegetables was effectively increased by adopting vermi composting and also mass production of *Trichoderma* and *Psuedomonads.* The poultry was integratged with *in-situ* azolla production.

SRI in paddy and zero tillage in wheat

The SRI method in paddy was introduced in about 5 ha. of land and this served as a great **relief for farmers to cope with initial deficit in rain** that occurred during the growing season of paddy. **The yield of paddy, in spite of draught conditions was 5.0 t/ha compared to 2.2 t/ha** with traditional method**.** Apart from this the zero tillage in wheat was successfully taken up in the adopted villages by the small and marginal farmers which saved them the cost of diesel for one initial irrigation and also the charges for ploughing with the tractor. This was taken up in nearly 30 sites in the two adopted districts.