13. TRADITIONAL TECHNICAL KNOWLEDGE

With the spectacular achievement in the field of agricultural sciences, India has been able to reach the stage of self-sufficiency in the agricultural production. But, in this change, we overlooked and rejected sustainable natural farming systems and moved towards “exploitative” agriculture with increased dependency on farm machinery and chemicals (fertilizers, pesticides, etc.), which proved counter productive and resulted in depletion of soil and water resources, increase in desert and climatic disturbances, natural calamities, deterioration of environment, and unprecedented fuel wood cries. Among many challenges in the coming years, the basic issue will/be to find ways for sustainable development which are environmentally sound and make the earth a better place to live in.

The best solution of this problem could be to blend the modern technology with the traditional one. The integration of scientific and traditional knowledge would help, to develop technologies, which are need-based, better problem-solving, locally available, easily acceptable, cost-effective, convincing and credible to the rural clientele.

There is a lot of indigenous agricultural know-how available with the farming communities specially the tribals. These traditional farming systems are products of centuries of accumulated experiences. Farmers all over the world have developed their own indigenous systems of farming with local inputs. In India the traditional system of farming is being practiced since the Vedic age (3700 BC).

This traditional wisdom can disappear unless their understanding values are promoted. Many of the practices, which were beneficial and were being used since generations have been lost because of lack of appreciation. Therefore, there is a need to explore the indigenous practices being used by the tribals and to get these scientifically validated for wider use by the farming community.

Crop Protection

Traditional systems of crop protection, rooted in the simple practices that farmers have learnt from their long association with the land, its flora and fauna, were based on ecofriendly systems of suitable cultural practices, judicious rotation of crops, and knowledge of pests and their life cycles. Some of the traditional methods of cultivation, which has direct bearing on pest control, are:

1. Maize seeds are soaked in cow urine for 10-12 hours before sowing. According to farmers, this treatment increases resistance against insect pests.
2. Rice seedlings raised from seed treated with extract of neem kernel are vigorous and resistant to leafhopper.
3. In paddy, spraying a solution of 4 l of cow urine and 10 g asafoetida in 10 l of water, repel the sucking pests (aphids,jassids).
4. In paddy, spraying a solution of cow dung prepared by mixing 3 kg cow dung in 3 l of water was observed in the study area against the control of paddy blast and bacterial blight.
5. In case of insect holes made by shoot borer and bark eaters in mango tree, jaggery is placed in the holes to attract other predators (ants), so that they will feed upon the insects present in the hole. Similarly the practices of pouring kerosene in holes and 'blocking holes with cow dung were also observed in the area.
6. For prevention of infestation of shoot borer in mango tree, common salt is mixed with soil near the collar region of the tree.
7. In case of 'bunchy top' disease in chilies dusting of ash; use of gugul (Commiphora wightii) smoke; spray of sour butter milk; spray of liquid waste of tanned leather, and spray of cow/goat urine was recorded in the tribal areas.

8. A peculiar method of controlling diseases in chilli was observed in which the twigs of aak (Calotropis spp.) are placed in chilli field in between rows. Similarly some farmers placed fresh cow dung near the collar region of plant to prevent it from fungal diseases viz., damping off and die back.
9. In case of soil-borne diseases viz., root rot, collar rot, etc. and termites, the castor cake, karanj cake, or neem cake were used as a control measure.
10. In case of sugarcane crop, use of common salt (100-125 kg/ha) during intercultural operations was found to be common. According to farmers, the salt is effective against termite problem.
11. During sprouting of sets in sugarcane crop, putting stems of aak (Calotropis spp.) in the irrigation channels is effective against control of termites, white grub, and borers.
12. Use of kerosene was also common against control of termites in the field.

Weather Forecast

In recent times, there has been a growing demand for more accurate and reliable weather forecasts. Modern scientific knowledge and modern methods of weather forecasting have originated recently. But, ancient indigenous knowledge is unique to our culture. India had a glorious scientific and technological tradition in the past. Our ancient astronomers and astrologers made a scientific study of meteorology. Even today, it is common that village astrologers (Pundits) are correct in surprisingly high percentage of their weather predictions. Unfortunately, with the evident of so-called scientific technologies during the past one-century, even if these are reductional and uni-dimensional in nature, the ancient knowledge, which is holistic and multidimensional in nature, has been sidelined and totally neglected by today's so-called scientific minded rationalists.

The most common methods of predicting rainfall are :

1. Rain bird; if the rain bird gives eggs at the ground level then, there will be less rain however; if the eggs are laid at higher elevation then it is the indication of more rains. The local people assume that eggs of rain bird are laid on such a height that in case of more or less rains, the eggs will not be submerged in rainwater. Similarly, if the nanow ends of all the four eggs of rain bird are downwards, then it is the indication of good rainfall through out the season.

2. When the adventitious roots of the banyan tree (Ficus bengalensis) start sprouting (tillering), then the local people assume that the rains will appear within 2-4 days.

3. In castor (Ricinus spp.) and ber (Ziziphus nummularia) when the buds start sprouting, then it is predicted that rains will appear within 10-15 days.

4. The rains will appear after 10-15 days of flowering in babul tree (Acacia nilotica).

5. As soon as the neem kernels ripen and start falling, it is expected that there will be rains after 10-15 days.

6. Rain may come if damsel fly flies at ground surface, frogs make noise and ants move in line from one place to another.

The farmers were also forecasting rains by observing the direction of wind/clouds. According to them Westerly winds/clouds meant good rainfall. Similarly Northwesterly clouds will bring hailstorm and meager rains.

Animal Management

Some of the indigenous practices used by the tribals in the area of animal management are as under :

1. Castration in males is done by destroying the spermatic cord with a stone/hammer and applying cow dung / karanj oil as an antiseptic.
2. In case of respiratory distress, animals are branded with hot iron rod on the neck.
3. Treatment of bloat is done by drenching indigenous materials like;

- A mixture of 0.5 of buttermilk + 100 g mustard oil + 100 g ground rapseed.
- Bark of roheda tree (Tecomella undulata) ground and mixed with water.
- A mixture of meerchu (local herb) ground 25 g + 0.5 I buttermilk + 25 g of rapeseed + 1 small onion + 50 g of mustard oil + 25 g of common salt.
- Bark of haru tree ground and soaked in water.
- A mixture of butter milk + common salt + onion + raw custard apple
- Roots of date palm tree 200 g (ground) and mixed with water.
- 5-10 leaves of custard apple (ground) and black cumin (50 g) mixed with buttermilk.

4. In case of FMD (foot and mouth disease). a small fish wrapped with a piece of bread is fed to the diseased animal till the animal is not completely cured.
5. For deworming the following measures are taken:
   - Drenching with copper sulfate 25 g in one litre of water.
   - Dilute neem solution
   - Sesame leaves crushed, mixed with water. and strained, are drenched.
6. For control of external parasites. kerosene is applied on the body of animal with the help of cotton gauze.
7. To facilitate normal pasturition, cows buffaloes are fed crushed wheat soaked in water and mixed with jaggery and ghee oil for one month prior to calving.
8. For treatment of anestrus in buffaloes, following measures are taken:
   - Match stick (two match boxes) wrapped in a piece of bread is fed to animals.
   - Seeds of datura (Datura fastuosa) 4-5 are fed
   - Dry flowers of mahua tree (Madhuca indica) 250 g boiled in llitre are fed for 5 days.
   - 250 g flowers of khakra (Butea monosperma) boiled in llitre of water are fed for 4-5

days.

- ❖ Crushed sorghum (2 kg) soaked in water is fed for 2-3 days.
- ❖ Droppings of poultry mixed with bread or concentrate is fed.

9. In case of pneumonia, cactus (used for fencing) is burnt and the ash mixed with water is drenched twice to the animal.
10. In case of fractures, (a) leaves of khakra (Butea monosperma) are bandaged all over the affected part and splints of bamboo are tied around it. (b) eggs of local poultry breed given.
11. In case of excessive salivation (FMD) a tuber sooran (Amorphallus campanulatus) is ground and drenched with water.
12. To increase milk production the following methods are adopted:
    - ❖ Feeding of boiled crushed maize 1/2 kg to a cow and I kg to a buffalo for about one month.
    - ❖ Feeding leaves of sem (Dolichos purpureus) and chan ber (Ziziphus nummularia) increases milk production.
    - ❖ After calving, the milk left after sucking of calves is again fed to the cow/buffalo for 15-20 days.
13. Disease Management : Dipping the foot of animal in its urine for the control of foot and mouth disease; dipping the tail in hot water or by applying powdered camphor for overcoming tail neurosis; feeding ground neem leaves for internal parasites; feeding sprouted whole wheat for 10-15 days continuously for anoestrus, etc. The findings portray that a lot of wisdom still exists in rural areas but there is uncertainty about theirexpert validation.