

Integrated rice-fish farming by Apatanis

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In news- The Apatanis, one of the major ethnic groups of the eastern Himalayas, practise a distinctive form of agriculture where rice and fish are grown together.

About Integrated rice-fish farming-

- These farmers have been practising integrated rice-fish farming in their mountain terraces of Arunachal Pradesh since the 1960s.
- The potential areas of rice-fish culture in the Apatani plateau are Napping, Yachuli, Ziro-II, Palin and Koloriang. Apatanis principally use three rice varieties: Emeo, Pyape and Mypia.
- The total area of the Apatani Plateau is 10,135 square kilometres, where rice-fish culture is undertaken approximately in 592.0 hectares (ha).
- Apatani Plateau has a climate ranging from humid subtropical to temperate. So, this plateau receives adequate rainfall during the summer season. The permeability and water-retaining capacity of the clayey, loamy soil favour this unique farming technique.
- This integrated rice-fish cultivation is a low-input and eco-friendly practice. The stocked fish practically depend on the natural food sources of the rice fields and thus, farmers hardly need to use any supplementary fish feeds.
- The farmers sometimes use household and agricultural wastes and excreta of domestic animals like pigs, cows, mithun (*Bos frontalis*) and goats to make farming more sustainable and organic.
- Moreover, **azolla and lemna are also grown in the field water as nitrogen fixers.** The organic food grown in the

field plays an essential role in feeding fish.

- **The water sources in these high-altitude rice fields are mountain streams and rainwater trickled down during the monsoon season.**
- **Bamboo pipes are being used to distribute water** from the networks of earthen irrigation channels using two outlet pipes.
- An outlet is fitted angularly at the upper level through a dyke to maintain the water level and another outlet is fitted at the bottom of the dyke to the exterior. It is used for dewatering the field during harvest.
- Dykes at a higher elevation and lower elevation are constructed with a height of 0.9 m to 1.5 m and 0.4 to 0.6 m. These dykes are also used to remove water from the field during harvesting. Bamboo fencing is done to avoid the escape of fish through the pipes.
- Men and women perform different farm duties while preparing the fields for cultivating rice. And during the culture of fish, women folk participate as the major workforce.
- **They mostly use agricultural tools such as Dao (sickle) and dibbling sticks.** After preparing the field, they transplant a maximum of two-three healthy rice plants with an average distance of 26 cm from each other.
- **Fish refuges are also created inside the fields. Three strains of fish species of common carp – Cyprinus carpiospecularis, Cyprinus carpio communis, Cyprinus carpionudus are stocked just after ten days from transplanting rice.**
- The stocked fish are harvested twice in a season. The first and second or final harvest is done in the middle of July and October, respectively. But the rice is harvested at the end of September until the mid of October, i.e. once in a season.
- Four cultivars of rice are grown along with fish species of Cyprinus carpiol.
- **Fish enhances rice productivity (by 10-15 per cent) by**

controlling the growth of algae, weeds and insects, providing nutrient input through fish excreta and promoting tillering of the rice through the movement of fish inside the field.

- **Further, the mineralisation of organic matter, puddling of mud and soil aeration by other benthos enhances rice yield here.**
- This eco-friendly and economically beneficial practice has made the system unique in terms of aquatic resource utilisation.

About Apatanis-

- The Apatani (or Tanw, Tani) are a tribal group of people living in the Ziro valley in the Lower Subansiri district of Arunachal Pradesh in India.
- Apatani Plateau is a land of diverse cultures. **The major festivals of Apatanis are the Myoko, Dree, Yapung and Murung.**
- **The Apatanis speak a local language called Tani, including Apatani, English and Hindi.**
 - They worship the sun and the moon
- The tribe has extensive knowledge of herbal remedies to cure most of their ailments. Local ritual specialists also take part in chanting, blood-letting and animal sacrifices in a bid to keep the inhabitants healthy.
- **They are known for their effective traditional village council called bulyañ,** which supervises, guides and have legal oversight over the activities of individuals that affect the community as a whole.
- **Unlike the other tribes, they are non-nomadic in nature.**
- The Apatanis are among the few tribes in the world who continue to worship nature
- Their wet rice cultivation system and their agriculture system are extensive even without the use of any farm animals or machines.

- So is their sustainable social forestry system.
- **UNESCO has proposed the Apatani valley for inclusion as a World Heritage Site for its “extremely high productivity” and “unique” way of preserving the ecology.**