

Outcomes of Rice Fallow Project in Chhattisgarh

In the pilot study area of Chhattisgarh, agriculture field after harvest of Kharif (rainy) season rice are left uncropped in rabi (winter) season is typically called as rice fallow. This situation largely occurs in rainfed rice, where irrigation facilities for either rice or a post-rice crop are not available. Estimated rice fallow area in India was reported 11.65 million ha in which 82% is found in eastern India. In Chhattisgarh Kharif rice is grown in 37.6 lakh ha and 55-65% area remains fallow after rice which is great challenge for food security and farmers economy. To address rice fallows and enhance Kharif crops productivity with diversified cropping, present pilot study entitled Capitalizing Opportunities of Rice Fallows in Eastern India for Sustainable Livelihood Development was undertaken.

Two districts namely Gariyaband and Charama were selected for the study.

An area of 1500 ha was selected in both Charama and Gariyaband clusters. Thus total area of the pilot project was 3000 ha.

2. GOAL AND OBJECTIVES:

2.1 The overall goal of this project was to contribute agriculture growth and increase farm productivity, income and employment in order to augment food security and reduce poverty as well as improving the natural resource conservation in the rice fallow areas through optimization of the introduction of a second crop in the rice system. The specific objectives of the project were:

- a. Evolve and pilot test the promotion of production or farming system focused at second crop/ alternate livelihood interventions in the rice fallows of Eastern India.
- b. Develop and demonstrate convergence to support the systems perspective and a workable institutional mechanism for holistics development of rice fallows.
- c. Provide new in-sights for next generation comprehensive rainfed area development/watershed programmes and identify the enabling policy options for sustainable development of rice fallows.
- d. Increase the capacity of the developmental agencies and partners through joint

3. Identify problems and prospects:

Geographical area and Land use, area under Kharif, rabi and summer crops and varieties, status of mechanization, social problems, reasons for rice fallow, irrigation status, socioeconomic status, status of natural resources and utilization, status of livestock, livelihood activities, prospects and possibilities of double cropping was collected and analyzed.

4. Awareness and Skill development:

Success of any project largely depends on awareness, involvement and skill development of all stakeholders including all participating farmers in transparent manner. To achieve the set goal; need based training, exposure visit of farmers and farm women, field day and farmers fair, method and skill demonstration and other extension tools were implemented for various interaction.

5. Technology demonstrations:

To get desired results from demonstrations it is necessary to select technology carefully considering the farming situation and resource base available. Demonstration on crop production technology included selection of appropriate crop and variety, method of sowing, weed management, integrated nutrient and pest management, precision farming, use of water saving devices, use of various improved implements and machine etc.

6. Technologies for double cropping:

Short duration varieties and crops suitable for rainfed condition were selected. Improved varieties of crops also selected when 1-2 irrigations were available. Hybrid and high yielding varieties of rice, maize, wheat, pea, tomato, chili, brinjal, bitter gourd, bottle gourd, onion, ladyfinger, garlic, ginger, cabbage, cauliflower, cowpea, frenchbean and leafy vegetable selected with recommended package of practices.

7. Mechanization:

Tractor, bullock and tractor drawn seed drill, drum seeder, self propelled harvester, combined harvester, duster and ploughing implements like cultivator, iron biasi plough, rotavator, bund former, MB plough, power sprayer, seed treating drum etc. were made available to the farmers on custom hiring basis for timely operation.

8. Water resources development and utilization:

Water harvesting structures like farm pond, tank, diversion bund, loose rock dam, check dam, small ditch-chahla and recharging pit were constructed for rainwater harvesting and recycling.

Technologies for efficient use of irrigation water are the prerequisites to increase irrigation efficiency and maximize crop yields. Planting cucurbits (pumpkin, bottle gourd, ash gourd) in pits without tillage and irrigate only in pit manually or by channel, sprinkler, drip system with poly mulch, low cost drip irrigation system, crop diversification like maize in place of rice should be promoted.

9. Social problems and motivation:

Stray cattle, cropping in groups/ patches, resource sharing, theft, social fencing etc. are the issues to be tackled by involvement of farmers. Farmers should be motivated for growing of rabi crops and adoption of innovative technologies. Social conflicts if any should be resolved.

10. Feed, fodder, fruit and fuel plantations:

Double cropping improves feed availability but fieldbund and irrigated fields should be used for growing green fodder like maize, chari and berseem. Fruit and forest plantation like mango, drumsticks, guava, banana, papaya in badi system and field bunds Khamar, bamboo, gataran and karonda on boundary side of the field should be promoted.

11. Livelihood activities:

Spine gourd, sem, arhar, til, cowpea, marigold on rice bunds, semialata, ber and palas on field bund backyard poultry, goat, pig and cow rearing, lac culture in kusum and ber, wadi system, NTFP, fish and duck rearing, spawn and mushroom production, vermin compost etc. are the options for adoption to increase income and employment in the project area.

12. Market linkages:

Traditional marketing- transport product up to market and sale, produce lifting form field value addition and marketing, formation of group, branding and marketing should be promoted for competitive price of produce.

13. MAJOR OUTCOMES OF PROJECT

13.1 Beneficiary farmers:

In Gariyaband cluster 401 farmers and 1201 population was benefitted where as 821 farmers and 4678 population were benefitted in Charama cluster.

13.2 Irrigation and efficient water use:

In Gariyabad cluster 24 ha area was irrigated before start of the project and 361 ha after completion of the project. Thus, 57.7% (4.1 to 61.8%) cultivable area brought under irrigation using surface and ground water. Irrigated area increased from 129 ha to 548 ha as the impact of the project in Charama cluster.

13.3 Mechanization:

Mechanization and custom hiring services were promoted as a result large number of equipment and implements were procured by the farmers for cultivation of crops.

13.4 Organic manure:

Large number of Nadep pits, vermin compost units and biogas plants came in to existence after implementation of the pilot project and majority of farmers are using them for production of manures.

13.5 Integrated farming system models (IFS):

Seven integrated farming system (IFS) models were promoted and adopted by the farmers. Small, marginal and big farmers were adopting the models and obtaining round the year income and employment on sustainable basis. The outcomes of these nine modules as follows:

13.5.1 IFS Model for 0.80 ha farm size:

Farmers were growing kharif rice by traditional biasi method, yielding low and also delayed rice harvest. After adopting dry and moist line sowing with weed control and recommended package of practices, resulted in enhancement of productivity and early maturity of rice by 2 weeks, Rice-Chickpea-Vegetables-Cow, farming system was adopted. This model obtained gross return of 3-5 lakh and net return of 2-3 lakh with employment for 300-400 man days.

13.5.2 IFS Model for 1.20 ha Land:

Farmers were growing rice before start of this project that gave 36.7q/ha yield; Rs 0.55 lakh gross and 0.33 lakh net return along with 204 mandays annually. Rice-Vegetables-Chickpea-Cow IFS model was implemented for this land size for two years. The results showed significant increase in cropping intensity and rice yield. Net return of Rs. 2.97 lakh was obtained and Employment generated was 578

13.5.3 IFS Model for 1.60 ha Land:

One irrigated and another rainfed IFS models were tested under rainfed conditions, Rice-Chickpea-Cow-Custom hiring model was tested. The result showed that rice yield increased nearly one-fourth, chickpea yield was good, they earned around 0.50 lakh from custom hiring and 0.10 lakh from selling milk of cows. Altogether by adopting this model, a farmer may get 1.82 lakh annually over 0.73 lakh from traditional rice farming under irrigated condition, Rice-vegetables-fruit-rice-cow model was implemented. This model gave net income of Rs. 4.21 lakh.

13.5.4 IFS Model for 3.2 ha Land:

Out of 3.20 ha land only 0.80 ha was under cultivation before start of project. A tubewell was dugout there after cultivation on fallow land was started, RicVegetables-Chickpea-Maize-Cow, model was introduced, which gave net profit of Rs. 6.58 lakh. Employment was increased from 136 to 1051 manday annually.

13.5.5 IFS Model for 4.0 ha Land:

Traditional farming model was Rice-Cow-Lac-Culture-Fruit plant that gave net return of Rs. 0.87 lakh and employment for 377 mandays per annum. After intervention the improved model was Rice-Vegetables-Chickpea-Maize-Rice-Cow-Lac culture-Fruit plants. This model increased gross and net income several folds employment was available for more than 1524 mandays annually.

13.5.6 IFS Model for 8.80 ha Land:

In traditional farming model, farmers were using was Rice-Cow-Lac-culture-Fish pond, which was giving gross return Rs. 2.71 lakh, net return Rs. 1.71 lakh and employment of 861 mandays per annum from 6.0 ha. An area of 2.8 ha remained fallow.

After intervention of improved model of Rice-Vegetables-Chickpea-Wheat-Fish-Lac-Cow, gross and net income increased several folds and employment available for more than 2007 mandays annually.

13.5.7 IFS Model for >10 ha Land:

Before implementation of this project rainfed rice farming was practiced in 6.0 ha and rainfed maize in 0.40 ha . By this the yield of rice was 30.2 q/ha and maize was 32.7 q/ha, which giving net return of Rs. 1.59 lakhs, and employment for 1095 mandays. 5.2 ha land remained fallows. By constructing three tube wells and two shallow dugwell, and adopting IFS model Rice-Vegetables-Pulses-Oilseeds-Fruit-Flowers-Compost pit-Cow-Buffalo-Custom hiring system, it gave the gross return of Rs. 30.11 lakh and Rs. 17.29 lakh net income with employment for 2767 mandays.

13.6 Kharif crop area:

As a result of field leveling and bunding from MNREGA and creation of irrigation facilities waste and underutilized land were converted for cultivation of crops. Therefore, cultivable area increased by 161 ha in Charama cluster and 61 ha in Gariyaband cluster.

13.7 Rabi and summer crop area:

Rabi and summer crop area increased from 53 to 399 ha in Gariyaband and 129 to 503 ha in Charama cluster. In total, double cropped area increased from 182 to 846 ha in the two clusters.

13.8 Productivity of crops:

Productivity of rice increased remarkably (25.3 to 42.2 q/ha) in both the clusters due to adoption of improved agronomic package and adoption of high yielding varieties. Upland crop yields were also increased. Rabi and summer crop yield were remarkably higher with economic returns.

13.9 Cropping intensity:

Cropping intensity of Gariyaband cluster increased from 109 to 162% as the direct impact of the project. Similarly cropping intensity of Charama cluster enhanced from 112 to 149%. In the two clusters, cropping intensity increased from 111 to 155% after completion of the project.

13.10 Fodder availability:

With increase in irrigation, productivity and area of the crops during both kharif and rabi season, fodder availability of both the cluster increased from 25959 to 53039 tonn/annum.

13.11 Livelihood interventions:

Remarkable improvement in income and employment opportunities were recorded due to adoption of improved wadi cultivation, mushroom and lac production, NTFP, fish culture and rearing of animals and birds.

13.12 Family income and employment:

Average annual per family income at Gariyaband cluster increased from Rs. 43922 to 202112; whereas it increased from Rs. 99131 to 234160 at Charama cluster. On an average net per family income were 71527 Rs. per annum before start of the project which increased up to 218136 Rs. Per annum after completion of the project in two clusters.

13.13 Project cost and convergence:

An amount of Rs. 288 lakh was obtained from NRAA whereas Rs. 972 lakh was invested from convergence of various schemes in the two clusters. Thus, a total of Rs. 1260 lakh was invested in two clusters of the project.

13.14 Annual income and employment:

At Gariyaband cluster, annual net income increased from Rs. 153 to 759 lakh, where as annual income of Charama cluster increased from Rs. 492 to 1408 lakh. Further analysis showed that the cost of investment can be recovered in a year.

14. ACHIEVEMENTS AT A GLANCE:

| Factors | | Gariyaband cluster | | Charama cluster | | Total or average | |
|---------|---|--------------------|--------|-----------------|--------|------------------|--------|
| | | Before | After | Before | After | Before | After |
| 1. | Irrigated area (ha) | 24 | 361 | 129 | 548 | 153 | 909 |
| 2. | Irrigated area (%) | 4.1 | 61.8 | 9.0 | 40.1 | 6.6 | 51.0 |
| 3. | Drip System (ha) | 0 | 5 | 0 | 35 | 0 | 40 |
| 4. | Sprinkler (sets) | 5 | 146 | 35 | 166 | 40 | 312 |
| 5. | Motor cycles (nos.) | 25 | 127 | 44 | 166 | 69 | 293 |
| 6. | Tractors (nos.) | 3 | 7 | 3 | 15 | 6 | 22 |
| 7. | Vermi compost (nos.) | 0 | 15 | 0 | 43 | 0 | 58 |
| 8. | Nadep pit (nos.) | 0 | 12 | 0 | 9 | 0 | 21 |
| 9. | Biogas plant (nos.) | 3 | 23 | 1 | 11 | 4 | 34 |
| 10. | IFS model tested (nos.) | | | 0.0 | 9.0 | 0.0 | 9.0 |
| 11. | Kharif crop area (ha) | 586 | 647 | 1034 | 1195 | 1620 | 1842 |
| 12. | Rice yield (q/ha) | 20.5 | 38.6 | 30.0 | 45.8 | 25.3 | 42.2 |
| 13. | Rabi crop area (ha) | 53 | 343 | 129 | 503 | 182 | 846 |
| 14. | Summer crop area (ha) | 0 | 56 | 0 | 81 | 0 | 136 |
| 15. | Cropping intensity (%) | 109.0 | 161.6 | 112.5 | 148.9 | 110.8 | 155.3 |
| 16. | Fodder availability (t/annum) | 7507 | 18407 | 18452 | 34632 | 25959 | 53039 |
| 17. | Average net annual income per family (Rs.) | 43922 | 202112 | 99131 | 234160 | 71527 | 218136 |
| 18. | Average annual employment per family (man days) | 280 | 497 | 298 | 503 | 289 | 500 |

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|-----|--|--------|--------|--------|---------|--------|---------|
| 19. | Project Cost (Rs. In lakh) | - | - | - | - | - | - |
| 20. | Receipt from convergence | | 396.63 | | 574.97 | 0.00 | 971.60 |
| 21. | Receipt from funding agency-NRAA | | 143.89 | | 144.07 | 0.00 | 287.96 |
| 22. | Total cost | | 540.52 | | 719.04 | 0.00 | 1259.56 |
| 23. | Annual net income from project (Rs.1 lakh) | 152.69 | 758.75 | 492.00 | 1407.74 | 644.69 | 2166.49 |
| 24. | Additional income annually (Rs. In lakh) | | 606.07 | | 915.73 | | 1521.80 |
| 25. | Annually employment in the project area (000' man days) | 112.28 | 199.30 | 220.85 | 371.091 | 333.13 | 571.21 |
| 26. | Additional annual employment in the project area (000' man days) | | 87.02 | | 151.06 | | 238.08 |