**All India Coordinated Research Project on Dryland Agriculture**

1. **Project :**All India Coordinated Research Project on Dryland Agriculture
2. **Date of Start:** December, 2004-05
3. **PI & Staff Position :**

| **S. No.** | **Name** | **Designation** | **Date of Joining** | **Date of leaving** |
| --- | --- | --- | --- | --- |
| 1. | Dr. D. S. Thakur | Chief Scientist (Soil Science) | 2nd November, 2012 | Continuing |
| 2. | Sh. A. K. Thakur | Scientist (Agronomy) | 3rd December, 2011 | Continuing |
| 3. | Dr. G. K. Sharma | Scientist (Soil Science) | 4th December, 2011 | Continuing |
| 4. | Vacant | Sr. Scientist (Plant Breeding) | - | - |
| 5 | Sh. Tumesh Kosle | Sr. Tech. Assistant | - | - |
| 8. | Vacant | Sr. Tech. Assistant | - |  |
| 9. | Vacant | Sr. Tech. Assistant | - |  |
| 10. | Shri J. S. Pusham | A.D.O/ F.E.O | 1/02/2005 | Continuing |
| 11. | Vacant | F.E.O |  | 31/07/2007 |
| 12. | Shri D. K. Yadav | F.E.O | 1/02/2005 | Continuing |
| 13. | Shri S. K. Sikdar | F.E.O | 1/02/2005 | Continuing |
| 14. | Sh. D. S. Netam | Tractor Driver | 24/06/08 | Continuing |
| 15. | Vacant | Jeep Driver |  |  |
| 16. | Vacant | Stenographer |  |  |
| 17. | Sh. Meghnath | Jr.Clerk/Typist | -- | Continuing |
| 18. | Smt. Bodebai | Peon | -- | Continuing |
| 19. | Sh.Romanath | Peon | -- | Continuing |
| 20 | Sh.Prakash Yadav | Peon | -- | Continuing |
| 21 | Sh.Ramanchand Muriya | Peon | -- | Continuing |
| 22 | Sh.Khirdhar Yadav | Peon | -- | Continuing |

1. **Major Achievements** :

**I. Theme: Farming system research, Alternate land use, Rain water management:**

1. Under *Badi* (Home stead Garden), upper upland and upland farming situations, Mango (Dashehary & Amrapali), Guava (Allahabadi safeda), Chikoo (Cricket ball), Aonwla (NA 5), Lemon (Grafted), Litchi (Surguja selection 1, 2 & 3) and Cashew (V – 4) were planted for comparative evaluation of these fruit trees at adopted village Tahakapal, Block – Tokapal, . Among these fruit species, Cashew, Mango, Guava, Chikoo and Litchi were observed suitable for the existing farming situation (Fig. – 1).
2. Excavation of percolation tanks, small ponds and tanks were found helpful to increase rain fed double cropped area in the adopted village Tahakapal and these structures are also found as a source of additional income through fisheries, quackeries & cultivation of vegetables (Fig. - 2).
3. Tomato crop varieties (Punjab chhuhara & Pusa rubi) were taken in *Rabi* season and thereafter bottle guard was grown in summer season on 300 sq m area by utilizing indigenous drip irrigation system. Two types of needles (18 no. & 22 no) were utilized in the indigenous drip irrigation system for further optimization of the system. It was observed that the plants grown with big size needle gave superior yield than the small size needles (Fig. – 3).
4. Income of Rs.6164/- in 300 sq. m model of indigenous drip cultivation of *Rabi* and summer vegetable viz. tomato and then bottle gourd (Fig. - 4).
5. Continuous contour trenches at 10 m. distance were found effective to control soil erosion and conservation of moisture in the upland farming situation (Fig. – 5).
6. Vegetative live fencing of Jatropha, Subabool, Acacia, Tasmania and Gliricedea was observed effective to control stray cattle’s and for fuel & fodder purpose.
7. Through adopting suitable water conservation practices, second crop of Niger (Fig. – 6) with suitable varieties (Deomali & Ootackmund) was successfully cultivated (yield 3.5 q/ha) after harvesting of minor millet (Chikma) crop in the upland soils.
8. Among the groundnut varieties ICGS-37 (1118.8 kg/ha.) followed by ICGS-76 (1100.0 kg/ha.) and entry AK-159 (1075.0 kg/ha.) were found best under badi situation of Bastar.
9. In the sesame varietal trial, RT-54 (515.9 kg/ha.) was found to be the highest yielder followed by TKG-55 (504.0 kg/ha.), TKG-22 (484.1 kg/ha), TKG-21 (448.4 kg/ha) and RT-46 (444.4 kg/ha) under *Badi* situation.
10. In the pigeon pea varietal trial, conducted at adopted village Tahkapal under home steaded situation, ICP 8863 (1504.0 kg/ha.) followed by RPS 2006-1 (1432.5 kg/ha.), RA-7 (1256.5 kg/ha.), GT 101 (1238.1 kg/ha.) and Rajeev Lochan (1220.2 kg/ha.) were found significantly superior over check variety Asha (615.1 kg/ha).
11. Inter cropping for crop intensification in home stead garden for Maize + Pigeon pea (2:1) gave highest net return followed by Maize + Cow pea (1:2).

**Theme: Energy management**

1. In tillage option for rice crop establishment (IR-64) in midland situation, gave the highest significant grain yield (3110 kg/ha) with dry line sowing by seed drill followed by wet line sowing by drum seeder. The mean grain yield was recorded highest for dry line seeding by seed drill (Fig. – 7).
2. In the low land condition for rice crop establishment methods, the dry line sowing by seed drill gave the highest grain yield (6387 kg/ha). The B:C ratio was noticed maximum with the treatment dry line sowing by seed drill. Based on three year data dry line seeding by seed drill gave the best performance in terms of yield (Fig. – 8).
3. Under low land condition chick pea crop was sown using different establishment methods in the same plots which were used for rice establishment during *Kharif* season. Among the crop establishment methods, the maximum chick pea yield (858 kg/ha) was recorded with chick pea under seeding by bullock drawn *Nari* seed drill in the plots where rice was grown using dry line seeding methods (Fig. – 9).

**Theme: Eco- friendly water productive cropping system**

1. In the evaluation of crop establishment method, nutrient management and weed control for rain-fed midland rice, significantly maximum grain yield (3478 kg/ha, variety, IR-64) was recorded with the treatment line seeding (Dry aerobic) +GRD (80:60:30 kg NPK/ha) + Ex- situ GM incorporation by paddy weeder and weed control (Fig. – 10).
2. In the evaluation of crop establishment method, nutrient management and weed control for rain fed lowland rice the statistically similar grain yield (7189 kg/ha variety- Swarna) was noticed with Broadcasting (Dry aerobic) – Biasi + RDF 80:50:30 kg NPK/ha + in-situ green manure (Sun hemp) along with Line seeding (Dry aerobic) + RDF 80:50:30 kg NPK/ha + Post E weedicide (7083 kg/ha), Fig. - 11.
3. During *Rabi* season in lowland relay crops of Chick- pea, Batari (pea), Lathyrus (Lakhadi) and linseed were grown in the different rice plots. Among these relay crops highest yield was observed with field pea (1366 kg/ha) followed by lathyrus (1254.1 kg/ha) and by chick-Pea (881.6 kg/ha), Fig. - 12.

**Recommended domain area:**

Bastar, Narayanpur, Dantewada, Bijapur and Kanker districts of Chhattisgarh where the landscape is undulating and uplands are 55% of TGA. This technology can be used in upland Badi farming situation which is about 6-8 % of cultivated area.

Rice –fish cultivation is suitable for low land rice farming situation which is about 20% of cultivated area in Bastar (150000 -175000 ha). If this technology is up-scaled even to 5% of lowland rice area it is likely to have very large impact on net income and food and nutritional security of tribal farmers.

**Recommended domain**

Bastar, Narayanpur, Dantewada, Bijapur and Kanker districts of Chhattisgarh. It can be excellent model for NREGP.

Integrated Agri-horti-silviculture model for development of upland farming system is suitable for upland (marhan, tikra and badi) farming situation which is 6-8 % ( 50-70000 ha) of cultivated area in Bastar region. If this technology is up-scaled even to 20% upland area it is likely to have very large impact on net income and food and nutritional security of tribal farmers.

**Recommended domain Area:**

Bastar, Narayanpur, Dantewada and Bijapur districts of Chhattisgarh where uplands are 55% of TGA. This technology can be used in upland Badi farming situation which is about 6-8 % of cultivated area and is very suitable for NREGP.

**Demonstrations Conducted:**

Village level demonstrations were conducted to demonstrate the advanced technologies for *Kharif* Maize crop and during *Rabi* season demonstrations were conducted on Chick pea crop at village Takaraguda and Tahakapal, Block – Tokapal.

**Seminars/ Workshops/Trinings organized /Attended:**

1. Seminar : 4

2. Workshop : 6

3. Training organized : 8

4. Training attended : 4

**Impact :**

* 1. In the treated area the cropping intensity is increased up to 160 percent.
  2. The IFS model developed for upland farming situation is being adopted by farmers in the district.
  3. The indigenous drip model for Rabi & Summer vegetables is being disseminated in the farmer’s fields.
  4. About 12.5% increasing the yield of paddy is experienced due to the replenishment of ground water by water harvesting structures. The second crop cultivation through harvested rain water was recorded to improve the socio - economic condition of the farmers and village as a whole. About 8% farmers in the area have adopted the recycling of harvested water for vegetable crops and nearly every villager have understood the concept and benefits of reutilizing the harvested water.
  5. Inter cropping of Maize & Pigeon pea (2:1) and Maiz & Cowpea (1:2) were found suitable for *Badi* farming situation which is 6-8 % (50-70000 ha) of cultivated area in Bastar region. If this technology is up-scaled even to 20% area it is likely to have very large impact on net income and food and nutritional security of tribal farmers.
  6. Due to introduction of improve practices (variety, fertilizer & plant protection with mechanization) is found to increase the productivity of crops under rainfed condition.
  7. Increased yield of Tomato-40.0%, Brinjal-52.6%, Cabbage-74.5% and Chilli-57.50% was recorded with the application of improved technology of cultivation under rainfed condition and is being adopted by the farmers of the area.
  8. The measurements of soil & water conservation tested through the project in the adopted villages are being adopted in the watershed areas through different government agencies and these are found suitable for the Bastar division.

1. **Problems :**
   1. Funding from coordinated cell is very less to conduct the experiments and perform other related activity of the project looking to the higher rate of labour and materials.
   2. At the centre, infrastructure is very limited and an intensification of the infrastructure is required.
   3. One vehicle is needed to perform the duties of the project in the selected areas.
2. **Future Plan:**
   1. To develop Gravitational drip Irrigation System on Community base for the increasing of double crop area, utilization of harvested water and increase the per capital income.
   2. Construction of *krishak* club and self help group (SHG) for rainwater harvesting and soil conservation operation for natural resource management to enhanced the livelihood of the poor farmers.
   3. To develop the new IFS models for small and marginal farmers for the enhanced the livelihood, socioeconomic status.
   4. To develop the agro-horti models for utilization uplands/ baron lands.
   5. To develop the multipurpose Tree Nurseries for supplying quality sapling for the farmers.
3. **List of Extendable Technologies through KVKs**
   1. Indigenous Drip Irrigation System developed through AICRPDA.
   2. IFS Models for Upland farming situations.
   3. Alternate land use and rainwater management for baron uplands through developing fruit trees orchards and agro-horti models.
   4. Intercropping of Maize + Pigeonpea (2:1) and Maize + Cowpea (1:2) and Sorghum + Pigeonpea (1:2) were found suitable for upland situations may be extended by KVKs.
   5. Trenches, Percolation Tanks and small ponds for harvesting of rainwater and soil conservation.