



Role Model Extension and Outreach Initiatives of ICAR-NIBSM - Way to Doubling Farmers' Income

**ICAR - National Institute of
Biotic Stress Management**

Baronda, Raipur, Chhattisgarh - 493225

ICAR-National Institute of Biotic Stress Management

Baronda, Raipur - 493 225, Chhattisgarh, India

Tel. No.: +91-771-2277333

E-mail: director.nibsm@icar.gov.in

Website: <https://nibsm.icar.gov.in>

Citation

Role Model Extension and Outreach Initiatives of ICAR-NIBSM - Way to Doubling Farmers' Income. 2022. ICAR - National Institute of Biotic Stress Management, Raipur - 493 225, Chhattisgarh, India, 102 pp.

Published by

The Director and Vice-Chancellor

ICAR - NIBSM, Raipur - 493 225

Chhattisgarh, India

Concept and guidance

P. K. Ghosh

Compiled and edited by

P. Mooventhan

Sushil K. Sharma

Mamta Choudhary

Vinay Kumar

B. K. Choudhary

Team of Scientists Involved in Outreach

MGMG: Anil Dixit, S. K. Jain, R. K. Murali Baskaran, Sushil K. Sharma, K. C. Sharma, P. N. Sivalingam, Mamta Choudhary, Binod Kumar Choudhary, Vinay Kumar, Lata Jain, P. Mooventhan, Sridhar J., L. L. Kharbikar, Mallikarjuna J., Yogesh Yele, Ashish Marathe and Soumya Dash.

SCSP: Anil Dixit, Mamta Choudhary, Binod Kumar Choudhary, Vinay Kumar, L. L. Kharbikar, K. C. Sharma, Sridhar J and Sushil K. Sharma

TSP: Anil Dixit, K. C. Sharma, P Mooventhan, Mamta Choudhary, Binod Kumar Choudhary, Sridhar J. and Sushil K. Sharma

NEH: P. Mooventhan and Sridhar J.

Farmer FIRST, DBT Biotech-KISAN and DST SYST: P. Mooventhan

Acknowledgment

Indian Council of Agricultural Research, New Delhi

Ministry of Social Justice and Empowerment, GoI

Ministry of Tribal Affairs, GoI

Department of Biotechnology (DBT), Ministry of Science & Technology, GoI

Department of Science & Technology, Ministry of Science & Technology, GoI

FOREWORD

ICAR-NIBSM reaching the unreached through extension and outreach programme such as Scheduled Caste Sub-Plan (SCSP), Tribal Sub Plan (TSP), NEH Programs, Farmer FIRST Programme, Mera Gaon Mera Gaurav (MGMG) and Biotech-KISAN Hub. The basic objective of the SCSP has been to channelize the flow of outlays and benefits from the general sectors in the Plan of States for the development of Scheduled Castes, at least in proportion to their population, both in physical and financial terms. The scheme SCSP and TSP are being implemented at ICAR-NIBSM in two different modes, random distribution and as integrated farming system. The aim of random distribution is being followed to cover the maximum number of Scheduled caste and Scheduled tribe farm families for overall improvements of their socio-economic status by adopting modern agricultural technologies. Integrated Farming system module has been introduced for marginal farmers of the beneficiary community for doubling their income. The Scheduled caste and Tribal farm families were provided with good variety vegetable seeds, seedlings, horticulture plant materials, fodder crop seeds, farm implements, tractor operated fertilizer applicators, happy seeders, Carp Hatcheries, Chick Brooders, post-harvest processing units for pulses and grains, improved breeds of pigs like Large White Yorkshire, T&D, Hampshire and Sirohi breed of Goat, Vanraja breed of Poultry and Khakhi Campbell breed of Duck. An innovative initiative Mera Gaon Mera Gaurav (MGMG) programme is a farm-centric mission translating knowledge at farmer's doorstep so as to address his farm-oriented problems in a holistic manner to accomplish livelihood security. Cutting across all disciplines, farm problems are diagnosed and effective solutions are delivered and showcased in farmer's field. Synergistic interaction among stakeholders operational in the village could be interlinked to solve farmers' issue by the scientist concerned. The Farmer FIRST Programme (FFP) is an ICAR initiative to move beyond the production and productivity, to privilege the smallholder agriculture and complex, diverse and risk prone realities of majority of the farmers through enhancing farmers-scientists interface. The Farmer FIRST as a concept of ICAR is developed as farmer in a centric role for research problem identification, prioritization and conduct of experiments and its management in farmers' conditions. The focus is on farmer's Farm, Innovations, Resources, Science and Technology (FIRST).

The problems faced by the Indian farmer are special, small land holdings are the norm, a very small number of livestock which is often the primary source of livelihood.



Solutions developed in the lab, primarily in the developed world do not necessarily address the problems faced by the Indian farmer. There is a need for direct linkage between science laboratories and farms; it is now imperative that the Indian scientist understand the problems of the local farmer and provide solutions to those problems. Likewise, it is necessary to expose farmers to the scientific solutions available by bringing him to the scientific environment/laboratory. This close interaction and need based research will allow innovative solutions and technologies to be developed and applied at farm level. With this vision, Biotech-Krishi Innovation Science Application Network (Biotech-KISAN Hub)” implemented at ICAR-NIBSM in collaboration with KVKs of IGKV at three Aspirational Districts of Chhattisgarh. A total of 18,023 farmers belonging to Raipur, Balodabazar, Mahasamund, Rajnandgoan, Korba, Mahasamund, Durg, Janjgir-Champa, Dhamtari Jashpur, Narayanpur and Bastar districts of Chhattisgarh and North-East states benefitted due to operation of above said sub-plans and schemes by ICAR-NIBSM.

I compliment the Extension and Outreach team for their sincere efforts in making the significant impact on farmers' livelihood and overall development of the farming community of Chhattisgarh.

Dr. P K Ghosh

Founder Director and
Vice Chancellor



CONTENTS

| Sl. No. | Particulars | Page No. |
|---------|--|----------|
| 1. | Scheduled Caste Sub-Plan (SCSP) | 1 |
| 2. | Tribal Sub Program (TSP) | 10 |
| 3. | NEH programme | 18 |
| 4. | <i>Mera Gaon Mera Gaurav</i> (MGMG) | 35 |
| 5. | Farmer FIRST Programme (FFP) | 46 |
| 6. | Foldscope Programme | 68 |
| 7. | DBT Biotech-KISAN Hub | 74 |
| 8. | Policy formulation based on field visit and practical assessment | 100 |



I. Scheduled Caste Sub-Plan (SCSP)

Under the Scheduled Castes Development Bureau, the Ministry implements Scheduled Caste Sub-Plan (SCSP) which is an umbrella strategy to ensure flow of targeted financial and physical benefits from all the general sectors of development for the benefit of Scheduled Castes. Under the strategy, States/UTs are required to formulate and implement Special Component Plan (SCP) for Scheduled Castes as part of their Annual Plans by earmarking resources. At present 27 States/UTs having sizeable SC population are implementing Scheduled Caste Sub-Plan.

Objectives of the programme:

1. The main objective is to give a thrust to family oriented schemes of economic development of SCs below the poverty line, by providing resources for filling the critical gaps and for providing missing vital inputs so that the schemes can be more meaningful. Since the schemes / programmes for SCs may be depending upon the local occupational pattern and the economic activities available, the States/UTs have been given full flexibility in utilizing SCA with the only condition that it should be utilized in conjunction with SCP and other resources available from other sources like various Corporations, financial institution etc.
2. State Government have been given flexibility in choice of schemes to be implemented out of Special Central Assistance, within the overall frame work of the scheme.
3. The strategy of SCSP consists in important interventions through planning process for social, educational and economic development of Scheduled Castes and also for improvement in their working and living conditions.

Scheduled Caste Sub Plan (SCSP) – Aims and Strategy The strategy of Scheduled Caste Sub Plan (SCSP) since evolved in 1979 is aimed at:

- Economic development through beneficiary oriented programmes for raising their income and creating assets;
- Basti-oriented schemes for infrastructure development through provision of drinking water supply, link roads, house-sites, housing etc.
- Educational and Social development activities like establishment of primary schools, health centers, vocational centers, community halls, women work place etc.



| Sl. No. | Content | Particulars | | | | | | | | | | | | | | | | |
|--|--|--|----------|---------|--|--|------------|----------|----------|----------|------------------|----------|---|---------|------------------|---------|---|--|
| 1. | Year of implementation at ICAR-NIBSM | 2019 | | | | | | | | | | | | | | | | |
| 2. | Project site | Districts covered: Durg, Raipur, Mahasamund, Baloda Bazar, Raigarh and Jashpur. Total adopted villages: 18 (Keoradih, Madadih, Neurdi, Gidhour, Tor, Amlitalab, Kesla, Parsada, Sundra, Tildadih, Math, Bhadha, Budeni, Tarra, Burkoni, Kewtra, Baronda, Devgaon) | | | | | | | | | | | | | | | | |
| 3. | Number of farm families covered | <table border="1"> <thead> <tr> <th>2019-20</th> <th>2020-21</th> <th>2021-22</th> </tr> </thead> <tbody> <tr> <td>1140</td> <td>523</td> <td>584</td> </tr> </tbody> </table> | 2019-20 | 2020-21 | 2021-22 | 1140 | 523 | 584 | | | | | | | | | | |
| 2019-20 | 2020-21 | 2021-22 | | | | | | | | | | | | | | | | |
| 1140 | 523 | 584 | | | | | | | | | | | | | | | | |
| 4. | Number of training organised | <table border="1"> <thead> <tr> <th>2019-20</th> <th>2020-21</th> <th>2021-22</th> </tr> </thead> <tbody> <tr> <td>06</td> <td>06</td> <td>04</td> </tr> </tbody> </table> | 2019-20 | 2020-21 | 2021-22 | 06 | 06 | 04 | | | | | | | | | | |
| 2019-20 | 2020-21 | 2021-22 | | | | | | | | | | | | | | | | |
| 06 | 06 | 04 | | | | | | | | | | | | | | | | |
| 5. | Number of Demonstration organised | <table border="1"> <thead> <tr> <th>2019-20</th> <th>2020-21</th> <th>2021-22</th> </tr> </thead> <tbody> <tr> <td>16</td> <td>10</td> <td>04</td> </tr> </tbody> </table> | 2019-20 | 2020-21 | 2021-22 | 16 | 10 | 04 | | | | | | | | | | |
| 2019-20 | 2020-21 | 2021-22 | | | | | | | | | | | | | | | | |
| 16 | 10 | 04 | | | | | | | | | | | | | | | | |
| 6. | Seed material distributed | <table border="1"> <thead> <tr> <th>2020-21</th> <th>2021-22</th> </tr> </thead> <tbody> <tr> <td rowspan="6">Mango, lime, papaya, dragon fruit, leechi, pear, strawberry, broccoli, and potato seeds</td> <td> <table border="1"> <thead> <tr> <th>Crop</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>Rice</td> <td>120 qtls</td> </tr> <tr> <td>Pigeon pea</td> <td>1.6 qtls</td> </tr> <tr> <td>Chickpea</td> <td>30 qtls</td> </tr> <tr> <td>Apiculture boxes</td> <td>200 Nos</td> </tr> <tr> <td>Vegetable seeds and kits and medicinal plants</td> <td></td> </tr> </tbody> </table> </td> </tr> </tbody> </table> | 2020-21 | 2021-22 | Mango, lime, papaya, dragon fruit, leechi, pear, strawberry, broccoli, and potato seeds | <table border="1"> <thead> <tr> <th>Crop</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>Rice</td> <td>120 qtls</td> </tr> <tr> <td>Pigeon pea</td> <td>1.6 qtls</td> </tr> <tr> <td>Chickpea</td> <td>30 qtls</td> </tr> <tr> <td>Apiculture boxes</td> <td>200 Nos</td> </tr> <tr> <td>Vegetable seeds and kits and medicinal plants</td> <td></td> </tr> </tbody> </table> | Crop | Quantity | Rice | 120 qtls | Pigeon pea | 1.6 qtls | Chickpea | 30 qtls | Apiculture boxes | 200 Nos | Vegetable seeds and kits and medicinal plants | |
| 2020-21 | 2021-22 | | | | | | | | | | | | | | | | | |
| Mango, lime, papaya, dragon fruit, leechi, pear, strawberry, broccoli, and potato seeds | <table border="1"> <thead> <tr> <th>Crop</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>Rice</td> <td>120 qtls</td> </tr> <tr> <td>Pigeon pea</td> <td>1.6 qtls</td> </tr> <tr> <td>Chickpea</td> <td>30 qtls</td> </tr> <tr> <td>Apiculture boxes</td> <td>200 Nos</td> </tr> <tr> <td>Vegetable seeds and kits and medicinal plants</td> <td></td> </tr> </tbody> </table> | Crop | Quantity | Rice | | 120 qtls | Pigeon pea | 1.6 qtls | Chickpea | 30 qtls | Apiculture boxes | 200 Nos | Vegetable seeds and kits and medicinal plants | | | | | |
| | Crop | Quantity | | | | | | | | | | | | | | | | |
| | Rice | 120 qtls | | | | | | | | | | | | | | | | |
| | Pigeon pea | 1.6 qtls | | | | | | | | | | | | | | | | |
| | Chickpea | 30 qtls | | | | | | | | | | | | | | | | |
| | Apiculture boxes | 200 Nos | | | | | | | | | | | | | | | | |
| Vegetable seeds and kits and medicinal plants | | | | | | | | | | | | | | | | | | |
| 7. | Farm implements distributed | <table border="1"> <thead> <tr> <th>2019-20</th> <th>2020-21</th> </tr> </thead> <tbody> <tr> <td>Pedal operated potato peeler (30), Pedal operated potato slicer (30), Motorized Dal mill with 2HP motor (30), Multipurpose grain mill with 1 hp motor (60), Grain Cleaner (40)</td> <td>Ambika paddy weeder (100), Biyasi plough (100), Seed treatment drum (50), Maize sheller (500), Tendua iron plough (500)</td> </tr> </tbody> </table> | 2019-20 | 2020-21 | Pedal operated potato peeler (30), Pedal operated potato slicer (30), Motorized Dal mill with 2HP motor (30), Multipurpose grain mill with 1 hp motor (60), Grain Cleaner (40) | Ambika paddy weeder (100), Biyasi plough (100), Seed treatment drum (50), Maize sheller (500), Tendua iron plough (500) | | | | | | | | | | | | |
| 2019-20 | 2020-21 | | | | | | | | | | | | | | | | | |
| Pedal operated potato peeler (30), Pedal operated potato slicer (30), Motorized Dal mill with 2HP motor (30), Multipurpose grain mill with 1 hp motor (60), Grain Cleaner (40) | Ambika paddy weeder (100), Biyasi plough (100), Seed treatment drum (50), Maize sheller (500), Tendua iron plough (500) | | | | | | | | | | | | | | | | | |

| 8. | Livestock distributed | <table border="1"> <thead> <tr> <th data-bbox="735 233 980 281">2019-20</th> <th data-bbox="980 233 1219 281">2020-21</th> </tr> </thead> <tbody> <tr> <td data-bbox="735 281 980 459">Goats (510) and Chicks (20,000)</td> <td data-bbox="980 281 1219 459">Piglets (220), Ducklings (1500) and Chicks (10000)</td> </tr> </tbody> </table> | 2019-20 | 2020-21 | Goats (510) and Chicks (20,000) | Piglets (220), Ducklings (1500) and Chicks (10000) | | |
|----------------------------------|---|---|---------|---------|----------------------------------|---|-----|-----|
| 2019-20 | 2020-21 | | | | | | | |
| Goats (510) and Chicks (20,000) | Piglets (220), Ducklings (1500) and Chicks (10000) | | | | | | | |
| 9. | Service provided during COVID-19 pandemic | <ul style="list-style-type: none"> • Identification of SC beneficiaries and their requirement • Provided information related to the seed availability and plant protection measures for disease/ insect management in crops • Provided Telephonic support for the queries of farmers related to agriculture and animals, disease and insect management. | | | | | | |
| 10. | Social impact if any | <ul style="list-style-type: none"> • Economic development through beneficiary-oriented programmes for raising their income and creating assets. • Improve the living conditions of Scheduled Castes through provision of Food grains like Rice, pigeon pea, vegetables, Medicinal plants and water supply | | | | | | |
| 11. | Total number of intervention/technologies introduced or popularised at farmers' field | <table border="1"> <thead> <tr> <th data-bbox="735 1199 951 1247">2019-20</th> <th data-bbox="951 1199 1200 1247">2020-21</th> </tr> </thead> <tbody> <tr> <td data-bbox="735 1247 951 1425">Goat farming and poultry rearing</td> <td data-bbox="951 1247 1200 1425">Introduction of livestock based integrated farming system</td> </tr> </tbody> </table> | 2019-20 | 2020-21 | Goat farming and poultry rearing | Introduction of livestock based integrated farming system | | |
| 2019-20 | 2020-21 | | | | | | | |
| Goat farming and poultry rearing | Introduction of livestock based integrated farming system | | | | | | | |
| 12. | Name of the technologies adopted by farmers through the efforts of the programme | <p>Adoption rate of technologies yet to be studied</p> <table border="1"> <thead> <tr> <th data-bbox="735 1520 1016 1568">2019-20</th> <th data-bbox="1016 1520 1409 1568">2020-21</th> </tr> </thead> <tbody> <tr> <td data-bbox="735 1568 1016 1698">Goat farming and poultry rearing</td> <td data-bbox="1016 1568 1409 1698">Introduction of livestock based integrated farming system</td> </tr> </tbody> </table> | 2019-20 | 2020-21 | Goat farming and poultry rearing | Introduction of livestock based integrated farming system | | |
| 2019-20 | 2020-21 | | | | | | | |
| Goat farming and poultry rearing | Introduction of livestock based integrated farming system | | | | | | | |
| 13. | Total number of SC farmers covered | <table border="1"> <thead> <tr> <th data-bbox="735 1743 883 1791">2019-20</th> <th data-bbox="883 1743 1031 1791">2020-21</th> <th data-bbox="1031 1743 1179 1791">2021-22</th> </tr> </thead> <tbody> <tr> <td data-bbox="735 1791 883 1814">1140</td> <td data-bbox="883 1791 1031 1814">523</td> <td data-bbox="1031 1791 1179 1814">584</td> </tr> </tbody> </table> | 2019-20 | 2020-21 | 2021-22 | 1140 | 523 | 584 |
| 2019-20 | 2020-21 | 2021-22 | | | | | | |
| 1140 | 523 | 584 | | | | | | |



| | | |
|-----|--|---|
| 14. | Total number of Women farmers covered | 208 |
| 15. | Any special initiative taken to empower women farmers? | <ul style="list-style-type: none"> Farm implements like dal mill, grain cleaner and rice mill have been provided to self-help groups of women to minimize the labour requirements and for income generation. |
| 16. | Total coverage of cultivable lands (in Ha.) | 129 |

| Sl. No. | Training cum input distribution programme organized at ICAR-NIBSM, Raipur | Date and Place |
|---------|---|---|
| 1. | Rice cultivation and their pest management | 23 th -24 th , June 2021 |
| 2. | Scientific cultivation of pigeon pea and its plant protection measures | 03 rd -04 th August 2021 |
| 3. | Chickpea cultivation practices | 22 nd -23 rd August 2021 |
| 4. | Medicinal plants identification and their uses | 16 th December, 2021 |
| 5. | Vegetable cultivation and importance of improved seeds for nutritional security | 20 th -21 st December, 2021 |
| 6. | Training, demonstration, apiculture kit and accessories distribution programme | 24 th December 2021 & 25 th February 2022 |



Glimpses of SCSP activities:



Rice seed distribution and training on rice cultivation and management practices



Pigeon pea seed distribution and training on cultivation and management practices



Chickpea seed and vegetable kit distribution and training related to cultivation and management practices



Medicinal plants and vegetable seed distribution and training related to cultivation and management practices



Apiculture kit distribution and training programme under SCSP



Distribution of horticulture plants to farmers of Raigarh



Distribution of Potato seeds to SC farmers of Raigarh



Distribution of Sirohi Goats to farmers of district Raipur and stocking of T&D breed of piglets to farmers of Raigarh



Distribution of Poultry Equipments to Progressive farmer of Tilda for establishment of poultry unit



Distribution of Poultry Kadaknath chicks and feed to Progressive farmer of Tilda for establishment of poultry unit

II. Tribal Sub Program (TSP)

Balanced growth and economic development is the ultimate aim of every country and the strategic plans (Fifth five year plans as in case of India) are designed accordingly. After 25 years of independence, and successful completion of four five years and three annual plan, it was realized by policy makers that the Scheduled Tribes are still way behind the mainstream development process. Apart from this, it was also been realized that the general plan schemes and programmes designed for the overall development of the economy hardly improved their socio-economic status. Similarly, the benefit of such general welfare schemes did not percolate down towards the development of STs Population of the country in any significant manner. In order to eradicate these issues, the Tribal Sub-Plan was initiated during Fifth Five Year Plan for amelioration socioeconomic status of the tribal communities. The Tribal Sub-Plans are integral to the Annual Plans as well as Five Year Plans, making provisions therein non-divertible and non-lapsable, with the clear objective of bridging the gap in socio-economic development of the STs within a specified period.

Objectives of the programme:

The basic objective of Tribal Sub-Plan is to channelise the flow of outlays and benefits from the general sectors in the Central Ministries/Departments for the development of Scheduled Castes and Scheduled Tribes at least in proportion to their population, both in physical and financial terms. The Mid Term Appraisal of the Eleventh Plan has noted that several Central Ministries/Departments have not earmarked adequate funds to TSP, proportionate to the share of STs in the population. The broad objectives of the TSP are as follows:

- Substantial reduction in poverty and un-employment.
- Creation of productive assets in favour of Scheduled Tribes to sustain the growth likely to accrue through development efforts.
- Human resource development of the Scheduled Tribes by providing adequate educational and health services
- Provision of physical and financial security against all types of exploitation and oppression.



| Sl. No. | Content | Particulars | | | |
|---------|--|---|------------------------|---|---|
| 1. | Year of implementation at ICAR-NIBSM | 2018 | | | |
| 2. | Project site | Districts Kanker, Rajnandgaon, Raigarh, Jashpur and Mahasamund | | | |
| 3. | Number of farm families covered | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| | | 448 | 576 | 513 | 250 |
| 4. | Number of training organised | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| | | 06 | 10 | 08 | 06 |
| 5. | Number of Demonstration organised | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| | | 10 | 12 | 10 | 06 |
| 6. | Number of other capacity building programmes organised | - | | | |
| 7. | Seed material distributed | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| | | | Guava, Lemon, Turmeric | Dragon fruit, Mango, Litchi, Pear, Potato | Biofencing material, Karonda, Seasonal vegetable, seasonal flower |
| 8. | Farm implements distributed | 2018-19 | | 2020-21 | |
| | | Lac processing unit, Biyasi plough without bean, Sickle, Seed treating drum, Paddy drum seeder, Seed Storage bin 100 kg, SRI Marker (Marker + Handle), Tendua Iron plough with bean, Maize Sheller, Rice Transplanter | | Honey extraction machine | |



| | | | | | |
|-----|---|--------------------------------|---|---|--|
| 9. | Livestock distributed | 2019-20 | 2020-21 | 2021-22 | |
| | | Piglets and Chicks | Piglets, Ducklings and Chicks | Japanese quails, Ducklings and backyard poultry Chicks | |
| 10. | Total number of intervention/technologies introduced or popularised at farmers' field | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| | | Lac cultivation and processing | Pig farming, goat farming and poultry rearing | Introduction of livestock based integrated farming system | Introduction of integrated farming system |
| 11. | Name of the technologies adopted by farmers through the efforts of the programme | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| | | Lac cultivation and processing | Pig, goat and poultry rearing | Livestock based integrated farming system | Integrated farming system in 3 different module, floriculture-apiculture based, Fishery cum vegetable based and paddy cum goatery based. |
| 12. | Total number of ST farmers covered | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| | | 448 | 576 | 513 | 250 |

| | | |
|-----|--|--|
| 14. | Any special initiative taken to empower women farmers? | Livestock based Integrated farming system has been introduced in farm families and women farmers are primarily involved to empower them. |
| 15. | Any other details, if any? | Italian honey bee colonies were distributed to 250 farm families and 2 IFS sites |

Success story:

Name of Machinery Provided to Tribal Farmers - Lac Processing Unit
 No. of Group engaged in Lac processing - 3 groups (32 Farmers)

Background information:

Lac, a non-toxic valuable resin of insect origin has been produced in our country since time immemorial. Presently Lac is not only used as decorative material but also it is used as a medicine, food materials, manufacturing of electric material etc. Due to eco friendly nature demand of lac is increasing day by day. But due to extreme price fluctuations and low return from raw lac resulting downfall of production in the past decades (table1). Availability in plenty of natural lac host plant i.e. Kusum (*Schleichera oleosa*), Ber (*Ziziphus marutiana*) and Palas (*Butea monosperma*) and favourable climatic condition in the district are the main reason for lac farming. Before providing this processing unit farmers selling their produce as raw material (Unprocessed lac) and after processing farmers getting two times more price of their produce.

Glimpses of Activities: 2018-19



Distribution of Agricultural implements to tribal farmers of Rajnandgaon



Distribution of Agricultural implements to tribal farmers of Rajnandgaon



Distribution of Lac Processing Unit to farmers of Kanker



Demonstration of Lac Processing Unit to farmers of Kanker



Cultivation of lac in farmer's field

Glimpses of Activities: 2019-20



Distribution of Trios piglets to farmers of Jashpur



Distribution of horticulture plants to farmers of Jashpur



Distribution of Sirohi Goats to tribal farmers of Raigarh



Progeny of Sirohi Goats at tribal farmer's field of Raigarh



Progeny of pigs at tribal farmer's field of Jashpur

Glimpses of Activities: 2020-21



Establishment of small piggery unit at Koleng, Jashpur



Establishment of small poultry unit at Bodatongri, Jashpur



Distribution of horticulture plants to farmers of Jashpur



Distribution of Potato seeds to tribal farmers of Raigarh



Distribution of Potato seeds to tribal farmers of Jashpur

Glimpses of Activities: 2021-22



NOTE 8

Training of tribal farmers of Basna, Mahasamund on Japanese Quail farming



Distribution of horticulture plants to Progressive farmer of Mahasamund for establishment of IFS



Trining on Apiculture and Distribution of Honey bee boxes to tribal farmers of Basna and Saraipali, Mahasamund



Training on Mushroom production technology to tribal farmers of Basna and Saraipali, Mahasamund



Distribution of Mushroom Production kit for one year to tribal farmers of Basna and Saraipali, Mahasamund

III. NEH programme

The Ministry of Development of North Eastern Region is responsible for the matters relating to the planning, execution and monitoring of development schemes and projects in the North Eastern Region. Its vision is to accelerate the pace of socio-economic development of the Region so that it may enjoy growth parity with the rest of the country. While the Ministry of Development of North Eastern Region would coordinate with various Ministries/Departments primarily concerned with development and welfare activities in North Eastern Region, respective Ministries/Departments would be responsible in respect of subjects allocated to them.

ICAR-NIBSM, Raipur had initiated NEH programme during 2019-20. The North-Eastern Hill University (NEHU), Shillong, Meghalaya and its incubation center at Tura Campus has been identified as the nodal collaborating center for the implementation of this programme to improve the farmer's livelihood through agricultural enterprises integration in West Garo Hills and MoU under process. Total five modules were identified and implemented *viz.* crop based module, livestock based module, enterprise based module, horticulture based module and NRM based module. In 2020-21, we have included CAU, Imphal as a collaborating center under NEH to extend the activities to other parts of NE region.

Major achievements:

| A | Infrastructure |
|---|---|
| | <p><i>Facilities created</i></p> <ul style="list-style-type: none"> • Total 25 nos. of backyard Bio-floc farming unit in Manipur • Establishing Piggery unit- 20 units • Establishing Kroiler unit-10 units • Establishing Sericulture unit-150 units • Establishing Fish culture and production 10 units • Establishing Agro processing unit-10 units in Meghalaya |
| | <p><i>Beneficiary/target groups</i></p> <ul style="list-style-type: none"> • Total 25 farmers including OBC/GEN/SC/ST (Rural youths, Farm Women, Farmers) at CAU Center. • Total 250 farmers including 98 % of ST and 2% SC (Rural youths, Farm Women, Farmers) at NEHU, Tura Campus. |



| | |
|----------|--|
| | <p>How NER is getting benefitted:</p> <ul style="list-style-type: none"> • Income earning through small scale fish culture system to the unemployed youth, farm women, farmers of the NER and also to bridge the gap between supply and demand of fish in NER • Income earning through small scale agro-based livelihood improvement programmes to the unemployed youth, farm women, farmers of the NER and also to bridge the gap between supply and demand of agro-input supports in NER |
| B | Successful Technologies |
| 1. | Backyard Bio-floc based fish farming |
| | <p>Features</p> <ul style="list-style-type: none"> • To encourage farmers and unemployed youth into income earning through small scale fish culture system <p>Potential</p> <ul style="list-style-type: none"> • Large numbers of unemployed youths • Large gap between demand and supply of fish in the state • 90% of the total state population is fish eater. |
| | <p><i>Expected benefit over conventional technology</i></p> <ul style="list-style-type: none"> • Eco-friendly culture system. • It reduces environmental impact. • Improves land and water use efficiency • Limited or zero water exchange |
| | <p><i>Target group/geographical region</i></p> <p>Rural youths, Farm women, Farmers etc. (Both Valley and hill regions)</p> |
| | <p><i>Adoption rate (among target group/region)</i></p> <p>In valley region the adoption rate is 100%</p> <p>In hill region the adoption rate is 40%</p> |
| 2. | Livelihood improvement programmes (Agro-based livelihood activities) |
| | <p>Features</p> <ul style="list-style-type: none"> • To encourage farmers and unemployed youth into income earning through small scale agro based livelihood activities |



| | |
|----------|--|
| | <p>Potential</p> <ul style="list-style-type: none"> • Large numbers of unemployed youths • Large gap between demand and supply daily needs of agro-based commodities in the state. • 98% of the total state population are consuming (pork, chicken, fish, silk pupa and its value added products) |
| | <p><i>Expected benefit over conventional technology</i></p> <ul style="list-style-type: none"> • Eco-friendly culture system. • It reduces environmental impact. • Improves land and water use efficiency • Limited or zero water exchange |
| | <p><i>Target group/geographical region</i> Rural youths, Farm women, Farmers etc. (Meghalaya)</p> |
| | <p><i>Adoption rate (among target group/region)</i> In the Meghalaya (Khasi, Garo and Jaintia Hill regions) the adoption rate is 92%</p> |
| C | Skill development training |
| 1. | <p><i>Topic</i></p> <ul style="list-style-type: none"> • Backyard Bio-floc Based Fish Farming • Livelihood Improvement Programme in Agro-based sectors, Tribal Community of Meghalaya |
| | <p><i>Duration</i></p> <ul style="list-style-type: none"> • 3 days (29th – 31st March, 2021) • Duration (7 skill development training), each training had 3 days duration in different time period from 2020 to 2022 |
| | <p><i>Target group</i></p> <ul style="list-style-type: none"> • OBC/GEN/SC/ST (Rural youths, Farm Women, Farmers) • 98% of ST and 2% of SC population in the Meghalaya states (Rural youths, Farm Women, Farmers) |
| | <p><i>Number of beneficiaries</i></p> <ul style="list-style-type: none"> • 25 nos. at CAU Center • 250 nos. beneficiaries at NEHU, Tura Campus |

| | |
|--|---|
| | <p><i>Expected benefits</i></p> <ul style="list-style-type: none"> • Backyard Bio-floc based fish farming will help to increase the fish production of the state and leads to doubling farmer's income. • Disseminated technology will help to enhance their livelihood status and self-sustainability in the Meghalaya state and leads to doubling farmers income among tribal community of that region. |
|--|---|

Recent initiatives/activities:

| Activity | Nos. | Place | No. of farmers benefitted | Details |
|---|------|--|---------------------------|---|
| Training/Skill development/capacity building programme conducted | 7 | Thenzawl, Mualthuum Buangpui, Ramlaitui Serchhip district, Mizoram | 240 | <ul style="list-style-type: none"> • Quality seed production and varietal purity. • Integrated farming system for sustainable development in Mizoram |
| | 2 | Pasighat, East Siang, Arunachal Pradesh | 46 | |
| | 3 | Nandok Saramsa, East Sikkim. Assam Lingzey, East Sikkim Lower Sumin, East Sikkim, Sikkim | 69 | <ul style="list-style-type: none"> • Entrepreneurial Skill Development for Economic Empowerment of Rural Women • Improved Composting Methods • Operation and maintenance of improved farm equipment for hill agriculture |

| | | | | |
|--|---|--|-----|--|
| | 9 | Jetra, Rongrakgre Asugre, Jetra KVK, South Garo Hills, Meghalaya. | 190 | |
| | 6 | Imphal East and West Manipur | 30 | |
| | 6 | Sepjahijala District, Tripura | 140 | Harvest and post-harvest fisheries with a special emphasis on "Value addition to Fish for employment generation. |
| Demonstration (FLDs/OFTs) conducted | 2 | Village Bokafa, Village Durga Rai Para, South Tripura Dist. Tripura | 50 | |
| | 6 | Asugre KVK, South Garo Hills, Rongrakgre Jetra, Rampragre, Dimagre & Dubugre. South Garo Hills, Meghalaya | 193 | |
| Awareness Camp | 2 | Village Bokafa, Village Durga Rai Para, South Tripura Dist. Tripura | 50 | |

| | | | | |
|---|--|---|----|--|
| Input supply to the beneficiaries (Seed, vegetable, horticulture samplings, vermicompost, fertilizer etc.) | Cowpea seeds- 20 kg, Vermicompost -240kg | Thenzawl Mualthum Buangpui Ramlaitui Serchhip district, Mizoram | - | Input were distributed to the farmers as a part of training/skill development programme |
| | Mushroom Bags (11kg) Jute Ropes (25Kg), Spawn (100kg) Fungicides (25 PKTs.) | Village Bokafa, Village Durga Rai Para, South Tripura Dist, Tripura | 50 | |
| | Mushroom spawn 150g/packet: 20 numbers Broccoli seeds: 5 packets (1 packet/ 4 persons) Pro tray: 5 nos. Coco peat (5 kg/block): 5 Neem cake (1kg/pkt) : 20 pkts; Biofertilizer (100ml/unit) : Nisarga (Trichoderma) | Nandok Saramsa, East Sikkim, Sikkim | 96 | The inputs were distributed as part of the training programme conducted for training/skill development programme |

| | | | | |
|--|---|--|----|---|
| | (100 ml/unit) : 20 units ; waste decomposer (20 ml/ unit; Rock phosphate @ (900 gram/unit) : 1.8 kg Tomato seed var Romeo (10 g/packet) : 5 Bitter gourd F1 hybrid (10g/packet) : 15 Neem cake (1kg/ packet) : 15 | | | |
| Other (Distribution of small tools, kits, farm implements etc to beneficiaries) | Hand held Maize Sheller | Lower Sumin, East Sikkim | 27 | The equipment was distributed as part of the training programme conducted |
| | 20 nos. of utensils distributed under the programme on "Preparation of Fish Pickle" on 17 th Feb, 2022 at KVK, Campus office 20 nos of mixer grinder distributed under the programme on "Preparation of Value added Fish products" on 25 th Feb, 2022 at KVK, Campus office. | KVK, Campus office, South Garo Hill, Meghalaya | 50 | |
| Other Input support provided: 2 nos. Band sealer for promotin of effective packing provided to be distributed to M/S Aniforde, Imphal East, M/S Limalan Fords, Imphal East. 1 no. Caje Wheel, 1 no. Of Leveller, 1 Water pump (Kiloslcar) procured to be Utilized CHCF. Purchased two items through GeM of about- Power riper, Power sprayer. VL solar Dryer-1 nos, VL Light Trap-10 nos and VL Small farm Tool Kits-5 nos. | | | | |

Glimpses of Activities: 2019-20



Agripreneurship and soft skills development programmes and Social Entrepreneurship Meet organised at Tura, NEHU, Meghalaya

Glimpses of Activities: 2020-21



Transfer of technology-Cum-Support Distribution activities at Tura, NEHU, Meghalaya



Capacity Building and Training program cum workshop on entrepreneurship development in Meghalaya

Glimpses of Activities: 2021-22



Promoting Piggery, Sericulture and Apiary activities at Meghalaya



Fixing of UV Stabilized Tarpaulin



Completed Bio-floc Structure



Water Preparation for Stocking of Fish Seed



Stocking of Fish Seed



Inauguration of Training Programme



Lecture Delivered



Distribution of Inputs



Construction of foundation for installation of Bio-floc

Pipe Fitting



Fixing of Iron Mesh

Fixing of Protective Sheet

Promoting Biofloc fish farming at Manipur, Imphal through CAU



Training on Quality seed production and IFS for sustainable development in Mizoram



Entrepreneurial Skill Development for Economic Empowerment of Rural Women at Sikkim



Apiary and preparation of Value added Fish products



Training on Mushroom Production

IV. Mera Gaon Mera Gaurav (MGMG)

The scheme was launched in the year 2015. The scheme envisages scientists to select villages as per their convenience and remain in touch with the selected villages and provide information to the farmers on technical and other related aspects of agriculture in a time frame through personal visits or on telephone. They may function with the help of Krishi Vigyan Kendras (KVKs) and Agriculture Technology Management Agency (ATMA).

- To provide farmers with required information, knowledge and advisories on a regular basis by adopting villages.
- To promote the direct interface of scientists with the farmers to hasten the lab to land process.
- To ensure that farmers benefit from best farm practices by providing required information, knowledge and advisories on regular basis by adopting villages
- To create awareness among farmers about the organisations and their programmes and schemes as well as government policies related to the farming sector.

Background information /Introduction:

ICAR- National Institute of Biotic Stress Management (NIBSM), Baronda, Raipur (CG) constituted three multidisciplinary teams of Scientists for the effective implementation of MERA GAON MERA GAURAV (MGMG) programme. Fifteen villages have been selected under the MGMG programme in two districts *viz.* Raipur (Block: Dharsiwa & Tilda) and Durg (Block: Patan & Durg). The Mera Gaon Mera Gaurav (MGMG) teams of ICAR-NIBSM scientists provided information to the farmers of selected villages (15) on various aspects in a time frame by conducting demonstrations, meetings/gosthis and mobile advisory, literature support and personal visit every month. The selected villages (15) were visited for 72 times repeatedly in 33 visits and benefitted 1035 farmers. Twelve farmers' meeting and five demonstrations has been organized. Scientific advisory on crop rotation, rice false smut and brown plant hopper (BPH) management and scientific method of paddy storage and rat control were also suggested to the beneficiaries.

Initiatives:

| S. No. | Total No. of Groups/team formed | No. of Scientists Involved | No. of villages covered | No. of field activities conducted | No. of messages/ advisory sent | Farmers benefited (No.) |
|--------|---------------------------------|----------------------------|-------------------------|-----------------------------------|--------------------------------|-------------------------|
| 1. | 03 | 13 | 15 | 35 | 39 | 1035 |



ICAR - National Institute of Biotic Stress Management (NIBSM), Baronda, Raipur (CG) constituted three multidisciplinary committee of Scientists for the implementation of *MERA GAON MERA GAURAV* (MGMG) programme. Fifteen villages have been selected under the MGMG programme in two districts viz. Raipur (Block: Dharsinwa & Tilda) and Durg (Block: Patan & Durg). The selected villages (15) were visited for 72 times repeatedly in 33 visits and benefitted 1035 farmers. Twelve farmers' meeting and 35 field activities/ demonstrations have been organized.

| No. of Scientists Involved | No. of villages covered | No. of field activities conducted | No. of messages/ advisory sent | Farmers benefited (No.) |
|----------------------------|-------------------------|-----------------------------------|--------------------------------|-------------------------|
| 05 | 05 | 15 | 15 | 391 |
| 04 | 05 | 12 | 13 | 369 |
| 04 | 05 | 08 | 11 | 275 |
| 13 | 15 | 35 | 39 | 1035 |

The *Mera Gaon Mera Gaurav* (MGMG) teams of ICAR-NIBSM scientists provided information to the farmers of selected villages (15) on various aspects in a time frame through monthly visit, demonstrations, meetings/gosthis and mobile advisory and literature support every month. The selected villages (15) were visited for 72 times repeatedly in 33 visits and benefitted 1035 farmers. Twelve farmers' meeting and 35 field activities/ demonstrations have been organized. Scientific advisory on crop rotation, rice false smut and brown plant hopper (BPH) management and scientific method of paddy storage and rat control were also suggested to the farmers/beneficiaries. Information on agriculture-related subject matter was disseminated among farmers through 39 messages. The subject matter ranged from paddy nursery management, remedy to deficiency, rodent problem, pest problem in rice, *Lathyrus*, wheat, organic farming, seed related information of rice, *Lathyrus*, pigeon pea, inquiry about rice, pigeon pea, *Lathyrus* seed availability, technology information about new varieties and about vegetables.

| No. of Team of Scientists | No. of Scientists | No. of Villages | No. of Blocks | No. of Districts | Bench Mark Survey conducted (No. of villages) |
|---------------------------|-------------------|-----------------|---------------|------------------|---|
| 03 | 13 | 15 | 03 | 02 | 15 |



Activities undertaken:

| S. No. | Name of activity | No. of activities conducted | No. of farmers participated & benefitted |
|--------|------------------------------------|-----------------------------|--|
| 1. | Visit to village by teams | 72 repeated visit | 418 |
| 2. | Interface meeting/ <i>Goshthis</i> | 12 | 350 |
| 3. | Training organized | 04 | 25 |
| 4. | Demonstrations conducted | 31 | 20 |
| 5. | Mobile based advisories (No.) | 39 | 39 |
| 6. | Literature support provided | 150 | 230 |
| 7. | Awareness created | 5 | 565 |
| 8. | Input support provided (q) | -- | -- |
| | Total | -- | 1647 |

Other activities organized:

| S. No. | Name of activity | No. / Area (ha) | No. of farmers benefitted |
|--------|--|-----------------|---------------------------|
| 1. | Linkages developed with other agencies (No. of agency) | 07 | 492 |
| 2. | Facilitation for new varieties, seeds, technology | -- | -- |
| | i. New varieties (No.) | 02/5 Acre | 6 |
| | ii. Technology (No.) | 05/262 Acre | 156 |
| | iii. Seeds (q) | 06/5 ac | 06 |
| | iv. New crops (No.) | — | -- |



MGMG team visited paddy field



Vigilance awareness



Suggestion at the time of Paddy transplantation



Demonstration of sex pheromone trap in rice



Advisory for rodent management



Farmers meeting at village Tor



Scientists interacted with farmers at Tarighat village



Scientists interacted with farmers at Budgahan village



Scientists interacted with farmers at village-Sipkona and Sonpur



Diagnostic team visit



Interaction of scientists with women farmers at village-Tor



Parthenium awareness at village - Budgahan school

Year: 2018-19

Fifteen villages have been selected under the MGMG programme in two districts viz. Raipur (Block: Dharsinwa & Tilda) and Durg (Block: Patan & Durg). The Mera Gaon Mera Gaurav (MGMG) teams of ICAR-NIBSM scientists provided information to the farmers of selected villages (15) on various aspects in a time frame by conducting demonstrations, meetings/gosthis and mobile advisory, literature support and personal visit every month. The selected villages (15) were visited for 58 times repeatedly in 26 visits and benefitted 1564 farmers. Fourteen farmers' meeting and 11 demonstrations has been organized. Scientific advisory on crop rotation, rat management and scientific method of paddy storage were also suggested to the beneficiaries.

| S. No. | Total No. of Groups/team formed | No. of Scientists Involved | No. of villages covered | No. of field activities conducted | No. of messages/ advisory sent | Farmers benefited (No.) |
|--------|---------------------------------|----------------------------|-------------------------|-----------------------------------|--------------------------------|-------------------------|
| 1. | 03 | 15 | 15 | 47 | 22 | 1564 |

| No. of Scientists Involved | No. of villages covered | No. of field activities conducted | No. of messages/ advisory sent | Farmers benefited (No.) |
|----------------------------|-------------------------|-----------------------------------|--------------------------------|-------------------------|
| 05 | 05 | 15 | 7 | 450 |
| 05 | 05 | 16 | 8 | 650 |
| 05 | 05 | 16 | 7 | 464 |
| 15 | 15 | 47 | 22 | 1564 |

Fourteen farmers' meeting and 11 field activities/ demonstrations have been organized. Scientific advisory on crop rotation, scientific method of paddy storage and rat control were also suggested to the farmers/beneficiaries. The subject matter for remedy to deficiency, rodent problem, pest problem in wheat, chick pea, *Lathyrus*, organic farming, seed related information of rice, Lathyrus, pigeon pea, inquiry about rice, pigeon pea, *Lathyrus* seed availability, technology information about new varieties and about vegetables.

| No. of Team of Scientists | No. of Scientists | No. of Villages | No. of Blocks | No. of Districts | Bench Mark Survey conducted (No. of villages) |
|---------------------------|-------------------|-----------------|---------------|------------------|---|
| 03 | 15 | 15 | 03 | 02 | 15 |



Activities undertaken:

| S. No. | Name of activity | No. of activities conducted | No. of farmers participated & benefitted |
|--------|------------------------------------|-----------------------------|--|
| 1. | Visit to village by teams | 58 repeated visit | 510 |
| 2. | Interface meeting/ <i>Goshthis</i> | 14 | 356 |
| 3. | Training organized | 02 | 30 |
| 4. | Demonstrations conducted | 11 | 86 |
| 5. | Mobile based advisories (No.) | 32 | 32 |
| 6. | Literature support provided | 11 | 120 |
| 7. | Awareness created | 3 | 430 |
| 8. | Input support provided (q) | -- | -- |
| | Total | -- | 1564 |

Other activities organized:

| S. No. | Name of activity | No. / Area (ha) | No. of farmers benefitted |
|--------|--|-----------------|---------------------------|
| 1. | Linkages developed with other agencies (No. of agency) | 05 | 492 |
| 2. | Facilitation for new varieties, seeds, technology | -- | -- |
| | i. New varieties (No.) | 03/6 Acre | 4 |
| | ii. Technology (No.) | 04/60 Acre | 60 |
| | iii. Seeds (q) | 05/10 ac | 10 |
| | iv. New crops (No.) | -- | -- |



Literature distribution at Village Akoli



Demo on bio-control agents to farm women



Pre-monsoon vaccination of animals at village- Mohdi



Field release of *Tricho* card



Interaction with farmers at village-Budgahan



Parthenium awareness in Village Barbanda School



Parthenium awareness in Village Barbanda School



Demo on cleanliness to Mohdi primary school students



Demo on cleanliness to Mohdi primary school students



Demo on working mechanism of Probe trap



Swachhata meeting with school children



MGMG team discussion with farmers at village- Tor

Year: 2019-20

Fifteen villages have been selected under the MGMG programme in two districts viz. Raipur (Block: Dharsinwa & Tilda) and Durg (Block: Patan & Durg). The Mera Gaon Mera Gaurav (MGMG) teams of ICAR-NIBSM scientists provided information to the farmers of selected villages (15) on various aspects in a time frame by conducting demonstrations, meetings/gosthis and mobile advisory, literature support and personal visit every month. The selected villages (15) were visited for 29 times repeatedly in 14 visits and benefitted 1175 farmers. Eight farmers' meeting and 06 demonstrations has been organized. Scientific advisory on crop rotation, rat management and scientific method of paddy storage were also suggested to the beneficiaries.

| S. No. | Total No. of Groups/team formed | No. of Scientists Involved | No. of villages covered | No. of field activities conducted | No. of messages/ advisory sent | Farmers benefited (No.) |
|--------|---------------------------------|----------------------------|-------------------------|-----------------------------------|--------------------------------|-------------------------|
| 1. | 03 | 15 | 15 | 14 | 0 | 1175 |

Fifteen villages have been selected under the MGMG programme in two districts viz. Raipur (Block: Dharsinwa & Tilda) and Durg (Block: Patan & Durg). The selected villages (15) were visited for 29 times repeatedly in 14 visits and benefitted 817 farmers. Ten meeting and 14 field activities/ demonstrations have been organized.

Activities undertaken by ICAR-NIBSM, Raipur under MGMG:

| S. No. | Name of activity | No. of activities conducted | No. of farmers participated & benefitted |
|--------|------------------------------------|-----------------------------|--|
| 1. | Awareness created | 2 | 446 |
| 2. | Demonstration conducted | 13 | 156 |
| 3. | Interface meeting/ <i>Goshthis</i> | 10 | 30 |
| 4. | Literature support provided | 01 | 20 |
| 5. | Training organized | 1 | 20 |
| 6. | Visit to village by teams | 14 | 503 |
| 7. | Mobile based advisories | 0 | 0 |
| | Total | -- | 1175 |



Other activities organized by ICAR-NIBSM, Raipur under MGMG:

| S. No. | Name of activity | Particulars | | |
|-------------------------|--|-------------------------|-------------------------|-----|
| 1. | Linkages developed with other agencies (No. of agency) | No of Agency (No) | 03 | |
| | | Farmers Benefitted (No) | 50 | |
| 2. | Facilitation for new varieties, seeds, technology | | | |
| | | i. New varieties (No.) | Numbers | 02 |
| | | | Area (ha) | 5 |
| | | | Farmers Benefitted (No) | 5 |
| | | ii. Technology (No.) | Numbers | 09 |
| | | | Area (ha) | 6.5 |
| | | | Farmers Benefitted (No) | 49 |
| | | iii. New crops (No.) | Numbers | 01 |
| Farmers Benefitted (No) | 01 | | | |



Demo on sex pheromone trap for management of *Spodoptera litura*, *Tuta absoluta*, brinjal fruit borer, tomato fruit borer



MGMG team discussion with farmers at village- Tor



Demo on bio-control agents to farm women



Rat management literature distribution



Probe trap demo for storage pest management



New fish pond to start fish farming at village-Tor



Visited progressive farmers field



Turmeric harvesting at village-Tor



Parthenium awareness week



Swachchata Pakhwara



BHP infestation



Rice smut

Year: 2020-21

| Content | Particulars |
|---|--|
| Year of implementation at ICAR-NIBSM | 2016 |
| Village/block/district details | Bangoli, Dhansoli, Kurra and Raikheda of Raipur districts |
| Number of farm families covered | 249 |
| Number of Demonstration organised | 12 |
| Service provided during COVID-19 pandemic | <ul style="list-style-type: none"> • Advised farmers for use mask and maintain physical distancing to prevent COVID-19 spread. • Advised frequent washing of hands to all farmers. • Awareness programmes organised to contain COVID-19 in nearby villages of our institute during visit to farmer's fields, Swachh Bharat Abhiyan and under MGMG programme |

| | |
|---|---|
| Total number of intervention/technologies introduced or popularised at farmers' field | <ul style="list-style-type: none"> • Decomposition of organic wastes for compost preparation • Awareness on mushroom cultivation • Awareness creation on diseases management in rice and horticultural crops • Management of weeds in crop fields • Management of Cattle hygiene • Awareness on insect induced losses and its management • Organised pachayat level goshti for creating awareness about organic farming. |
| Total number of SC farmers covered | 85 |
| Total number of ST farmers covered | |
| Total number of Youth (15-24 years) farmers covered/trained | 47 |
| Total number of Women farmers covered | 72 |
| Any special initiative taken to empower women farmers? | <ul style="list-style-type: none"> • Personal hygiene for better health • Development of nutritional garden in the backyard • Awareness on water borne diseases |



V. Farmer FIRST Programme (FFP)

Importance of Farmers FIRST Programme:

The Farmer FIRST Programme (FFP) is an ICAR initiative to move beyond the production and productivity, to privilege the smallholder agriculture and complex, diverse and risk prone realities of majority of the farmers through enhancing farmers-scientists interface. There are concepts and domains that are new in emphasis like resource management, climate resilient agriculture, production management including storage, market, supply chains, value chains, innovation systems, information systems, etc. The Farmer FIRST as a concept of ICAR is developed as farmer in a centric role for research problem identification, prioritization and conduct of experiments and its management in farmers' conditions. The focus is on farmer's Farm, Innovations, Resources, Science and Technology (FIRST). Two terms 'enriching knowledge' and 'integrating technology' qualify the meaning of Farmer FIRST in Indian context. Enriching knowledge signifies the need for the research system as well as farmers to learn from each other in context to existing farm environment, perception of each other and interactions with the sub-systems established around. Technology integration is looked from the perspective that the scientific outputs coming out from the research institutions, many times do not fit as such in the farmers' conditions and thus, certain alterations and adaptations are required at field level for their acceptance, adoption and success.

The past efforts brought lot of success in terms of raising production and productivity and addressing issues of the farmers and the technology was considered as a vital factor in the production system and farmer as a recipient of the technology outputs. The knowledge and innovations of the farmers were not valued much and their presence was relegated at most as a participant but not as a partner in the experimentations. The wisdom available with the farmers was also not channelized so much to derive suitable options for different production systems. The participation of multiple stakeholders was also not taken up in perspective for technology development, integration and adoption. Now the situation has changed drastically in terms of increased number of smallholders, growing proposition of women-led agriculture, need for higher return per unit area and addressing the changing socio-economic environment, etc. This necessitates new approach for project development involving innovation and technology development with the strong partnership of the farmers for developing location specific, demand driven and farmer friendly technological options.



Farmers tend to face problems related to production and natural resource management but they might not have found out solutions to overcome them. In such situations, Farmer FIRST is an opportunity for the researchers, extension professionals and farmers to work together and find appropriate ways through assessing different solutions. During the production process, farmers often evolve new ideas to improve their cultivation and natural resource management activities. This creates a space for researchers, extensionists and farmers to design and organize new experiments. Farmer FIRST can be applied not only at household level but also at village and community level as community experimentation.

Usually, the experiments are managed at the individual farmer's level who are involved in the project or who are selected by the village as the representatives to conduct experiments. In addition, there are some cases where experiments focus to solve problems of the whole village. Farmer FIRST is a concept in which the farmers participate in the research process with scientists. Research questions are found out together with selected farmers or the whole village and villagers' participation in monitoring experiments with scientists. The aim is to find out new ways of doing and bringing in synergy of the stakeholders. The experiments need to be adapted to specific conditions of a farming system and to have the participation of farmers as well as scientists. Especially they must acknowledge local wisdom as a vital element for the development of useful innovations. The role of extensionists is to ensure implementation.

Farmer FIRST will create linkages between farmers-researchers and extensionists to support farmers to conduct appropriate experiments selected by them. It will help researchers and extensionists understand and know real needs of villages. In this process, priority does not come from researchers or extensionists but from the end users of results of research and technology development.

Aims and Objectives of FFP

Farmer FIRST' programme aims at enhancing farmer-scientist interface for technology development and application. It will be achieved with focus on innovations, technology, feedback, multiple stakeholder's participation, multiple realities, multi method approaches, vulnerability and livelihood interventions. The specific objectives are:

- To enhance farmer-scientist interface, enrich knowledge and facilitate continued feedback;
- To identify and integrate economically viable and socially compatible technological



options as adoptable models for different agro-ecological situations;

- To develop modules for farm women to address drudgery reduction, income enhancement and livelihood security;
- To study performance of technologies and perception of the farmers about agriculture as a profession in the rural settings;
- To build network of linkages of organizations around the farm households for improving access to information, technology, input and market.
- To institutionalize Farmer FIRST process.

Components of FFP

(i) Enhancing Farmer–Scientist Interface

- Enabling involvement of researchers for continuous interaction with farm conditions, problem orientation, exchange of knowledge between farmers and other stakeholders, prioritization of problems and setting up of research agenda.
- This component will create a strong farmer-scientist bond for continuous exchange of idea, innovations, resources, feedback for development of appropriate technology and human resource development.
- Identification of farm innovators and grooming them as technology agents for farmer to farmer technology dissemination, up-scaling and out-scaling.
- Regular visits of project team and other scientists to project site for orientation of problems and ground realities.
- Multi stakeholders' participation in building strong farmer-scientist interaction.
- Regular interactions of farmer-scientist at institute and project site through trainings, visits, workshops, interfaces, extension activities, etc.

(ii) Technology Assemblage, Application and Feedback

- Integrating components of technology for application in different agro-ecosystems will focus on innovations and feedback.
- Crop based modules will focus on intensification and diversification of existing systems with introduction of new varieties and technologies to substantially enhance income. On site input management like seed production by farmers through training, timely supply of quality seeds and resource management may be major activities.



- Horticulture based module will focus on seed production and nursery management, vegetable, fruit production, floriculture, post-harvest management, poly house technology and adoption of new technologies.
- Livestock based module will focus on raising the production and productivity of existing livestock, introduction of new breeds, animal health management, development of viable milk production units, poultry and fisheries. The livestock related different modules are to be developed as per the micro farming situations and socioeconomic status of the farmers.
- Enterprise based module will cover various income generating activities like seed and other inputs production, bee keeping, mushroom production, vermi-compost production, handicraft, processing and value addition, marketing through federating farmer groups etc. The farmers, youth, landless and farm women may be important target groups.
- NRM based module will have the insight to work upon natural resource management, climate resilient agriculture, use of resource conservation technologies, water harvesting and micro irrigation, micro-organisms, land races and bio diversity etc.
- Integrated Farming Systems (IFS) module emphasise different categories of land holders based on resource availability, socioeconomic conditions, risk bearing capacity, market availability etc.

(iii) Partnership and Institution Building

- Building partnerships involving different stakeholders, development of rural based institutions, agro-ecosystem and stakeholders analysis and impact studies.
- Creation of models of partnerships
- Institution building for bringing professionalism, leadership, marketing ability, organizing capability among farmers, database creation on perception, attitude and agricultural scenario.

(iv) Content Mobilization

- Project platform having institutions as partners will be used to develop specific contents for e-enabled knowledge sharing.
- Identification and pooling of available transferrable technologies available with different institutions.



- Project outcome to be utilized as part of content.
- Preparation of knowledge models as network representation of agricultural knowledge.
- Content management platform enabling off and online access.

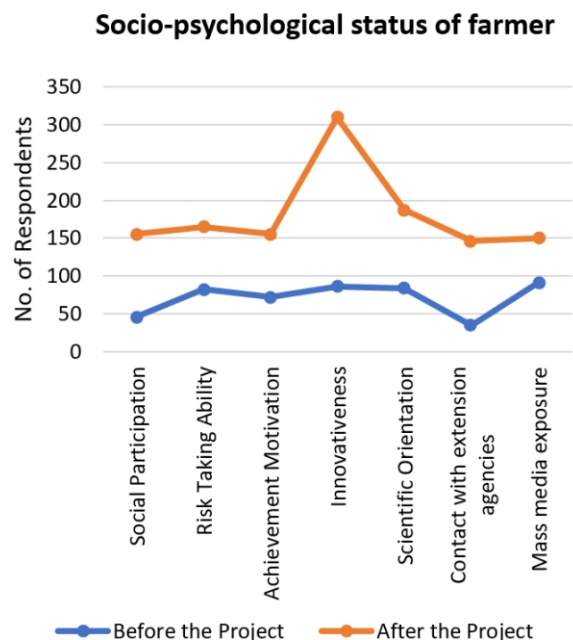
ICAR-NIBSM implemented Farmer FIRST project in 2016 at Baloda Bazar district in Chhattisgarh state. Baloda Bazar is located at 30.67°N 82.17°E. It has an average elevation of 254 m (833 ft). The district is subdivided into six development blocks called *tahsils*, namely Palari, Baloda Bazar, Kasdol, Bilaigarh, Bhatapara and Simga and 3 subdivisions namely Baloda Bazar, Bhatapara and Bilaigarh. Out of this Kasdol block were selected purposively because of the majority of tribal population. Total five villages namely – Kharaha, Bamhani, Kurraha, Kharri and Bakla were selected from Kasdol block and 500 tribal farm families covered form the five cluster of villages. In this project, resource poor tribal farmers, marginal and small land holders, youth, landless and farm women received the highest priority. In the project site rice was grown in more than 80% area during *Kharif* season. Cropping intensity of the area is 100%. Chickpea, wheat, horse gram, lathyrus and field pea are major rabi crops in the cluster villages. The project site is about 130 Kms. away from the ICAR-NIBSM, Raipur.

Major agricultural issues found in the study area:

- Rice fallow lands (82% of land left fallow after *Kharif* season)
- Low production and productivity
- Low level adoption of high yielding varieties
- Unawareness of GAPs and modern management strategies
- Lack of knowledge in plant protection measures & technical know-how
- Shortage of valid and timely farming information
- Lack of alternative livelihood options and seasonal migration
- Inability to do higher investment
- Lack of marketing network
- Shortage of skilled labour
- Mono cropping (Rice-Rice-Rice)
- Lack of awareness on conservation of biodiversity and importance in sustainability of homestead system.
- Subsistence nature of farming.

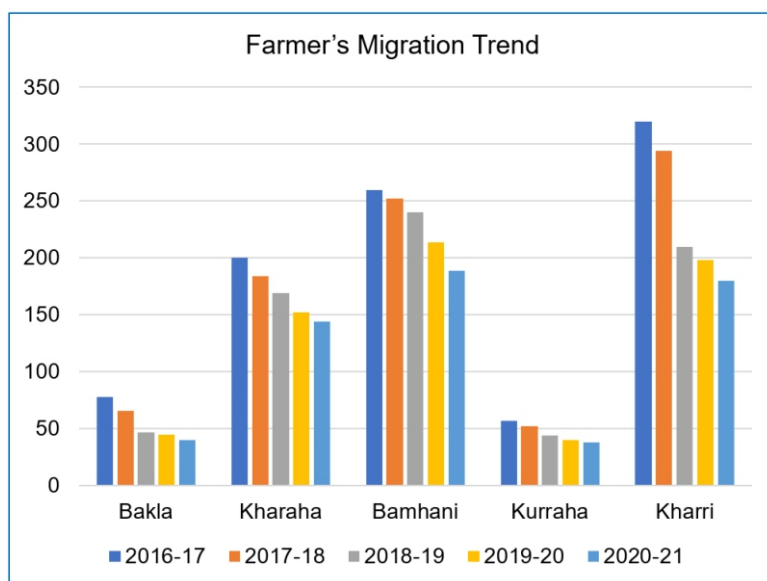


| Categories (High) | Before the Project | After the Project |
|---------------------------------|--------------------|-------------------|
| Social Participation | 46 | 156 |
| Risk Taking Ability | 82 | 165 |
| Achievement Motivation | 72 | 155 |
| Innovativeness | 86 | 310 |
| Scientific Orientation | 84 | 188 |
| Contact with Extension Agencies | 35 | 146 |
| Mass Media Exposure | 92 | 150 |

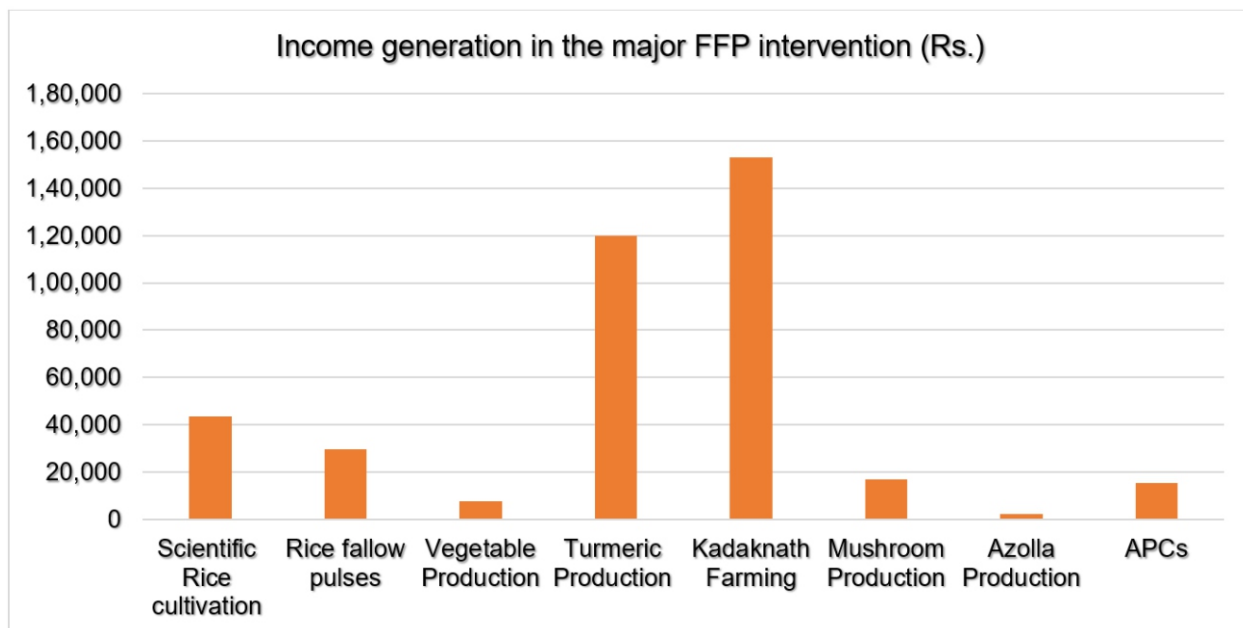


Reduction of seasonal migration in the FFP adopted villages

| Year | Reduction percentage |
|---------|----------------------|
| 2017-18 | 7.32 |
| 2018-19 | 22.40 |
| 2019-20 | 29.07 |
| 2020-21 | 35.41 |

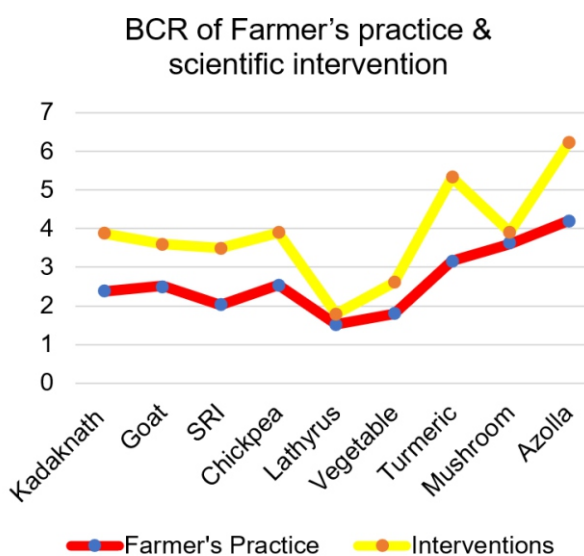


Reduction of seasonal migration in the FFP adopted villages

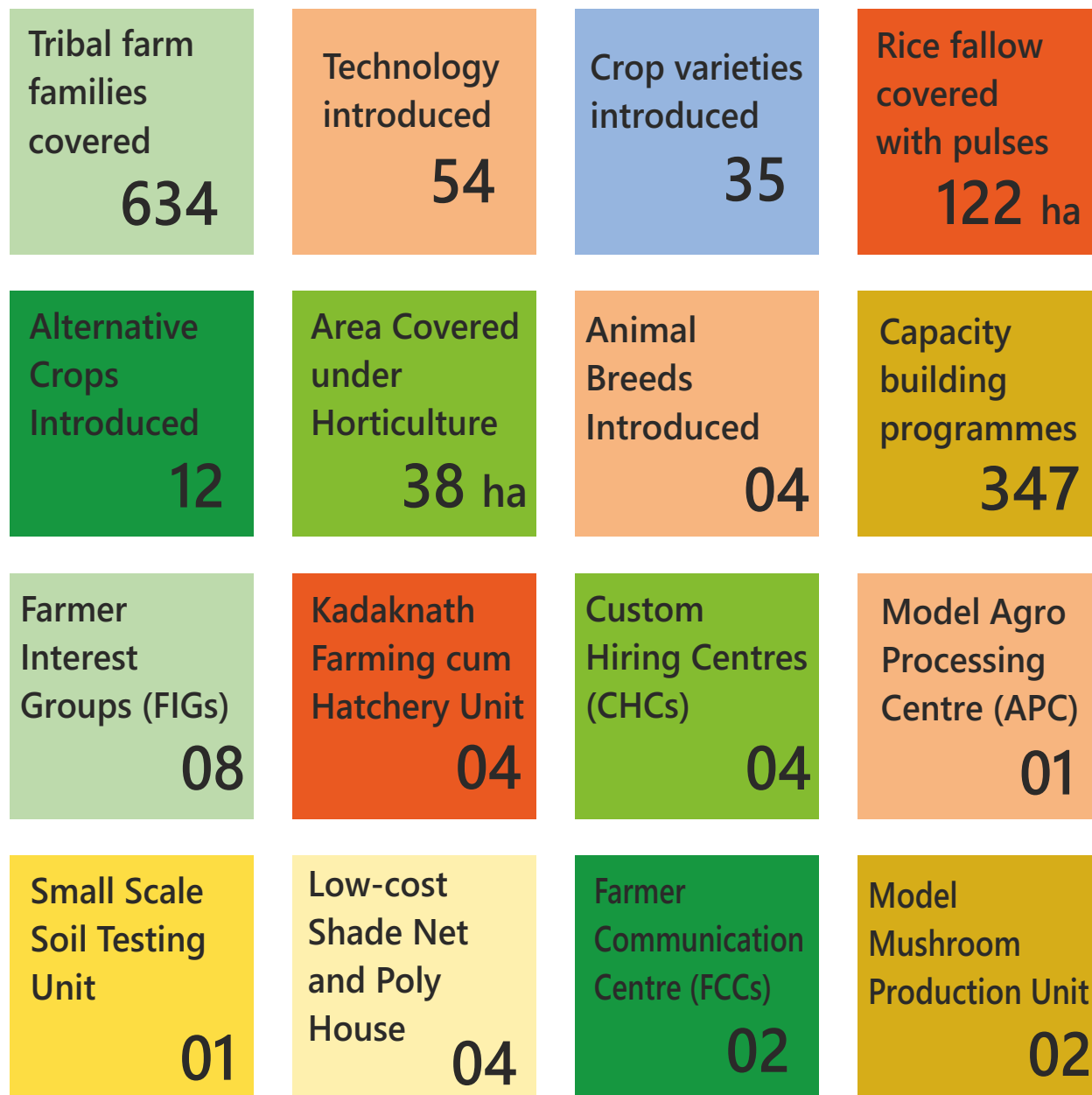


Impact of FFP Interventions: B:C ratio of farmer's practice and scientific interventions

| Technology/ Interventions | B:C ratio | |
|------------------------------|-------------------|---------------|
| | Farmer's Practice | Interventions |
| Kadaknath | 2.38 | 3.86 |
| Goat | 2.51 | 3.60 |
| SRI | 2.02 | 3.49 |
| Chickpea | 2.54 | 3.90 |
| Lathyrus | 1.53 | 1.79 |
| Vegetable | 1.80 | 2.61 |
| Turmeric | 3.16 | 5.33 |
| Mushroom | 3.61 | 3.91 |
| Azolla | 4.20 | 6.22 |



The salient outputs of the project



Coverage of Dainik Bhaskar before the launching of programme - 2016 about seasonal migration of farmers

दैनिक भास्कर **रायपुर संभाग**

छोड़ रहे गांव | आश्रित गांव संडी के पारधी मोहल्ले में कोई युवा नहीं बचा

कसडोल इलाके के गांवों में काम नहीं, ग्रामीण करते जा रहे पलायन

भस्कर न्यूज/कसडोल

जंगल क्षेत्र गांवों में कोई कार्य नहीं होने से मजदूर पलायन कर रहे हैं। संडी की आबादी 400 है यहां से 100 से ज्यादा मजदूर काम की तलाश में पलायन कर गये हैं। कुछ ग्रामीण काम है भी तो शालक्रीय कार्य में भुगतान मिलते बहुत कमय लगता है इसलिए मजदूर अन्यत्र पलायन कर रहे हैं।

शासन हर हाथ को काम देने की पट्टा करता है परन्तु काम के ही अभाव में कसडोल क्षेत्र के मजदूर अन्य प्रांत काम की तलाश में पलायन कर रहे हैं। कसडोल जंगल क्षेत्र के ग्राम पंचायत देवलराई के आश्रित गांव संडी की आबादी लगभग 400 है यहां 90 घर हैं जिसमें 30-35 घर से लोग परिवार सहित पलायन कर गए हैं। एक अनुमान के मुताबिक गांव से लगभग 30% मजदूर यानी 120 मजदूर बाल बच्ची सहित काम की ही तलाश में पलायन कर चुके हैं।

इस पंचायत के उप सरपंच अरुण चौहान एवं कोटवार अमीर सिंह चौहान से स्वेच्छा करने पर बताया कि यहां पारधी मोहल्ले में कोई भी व्यक्ति नहीं बचा है, सभी कामाने खाने पदार्थ प्रांत खाने गए हैं। यहां आकर जाने वालों में कदम राय, रमेशचंद्र, जगेशचंद्र, रमेश, बरबोलाल, निराल सिंह, कुजराय, लाल कुमर, गोलू, इंदर सिंह, रजिनीशान, सुंदरनाथ, जय नरेश, कपूरनाथ, आदि हैं। इनके अतिरिक्त पदार्थ मोहल्ले के देवुन बाबू, रतन राम, रंजु, सोनीलाल, सुनिषा गोड, अरुण सिंह परिवार सहित कामाने खाने कोई उपर प्रदेश तो कोई महाराष्ट्र, रायपुर, गोरखपुर

आज तक गांव में कोई कार्य प्रारंभ नहीं हुआ: उप सरपंच उप सरपंच चौहान ने राजस्वर मूलक कार्य के संबंध में बताया कि जब से मैं उप सरपंच बना हूँ आज तक कोई कार्य यहां नहीं हुआ है। काम की जगह हमारे क्षेत्र के सभी जन परिचित एवं अधिवासियों से अधिक बार कर चुके हैं लेकिन काम नहीं मिलता। कुछ दिन पूर्व किसानों को सलम जागड़े में 2 एकर के राजस्वर अलग की योजना की है जो अभी काल शुरू नहीं हुआ है।

पारधी मोहल्ला खाली, एक बुजुर्ग करता है रखावली

इस गांव के पारधी मोहल्ले में एक अन्न पूरा रखन पारधी का लक्ष्य पर रखावली करता है उन्होंने पूछने पर बताया कि यहां काम नहीं रहने से मोहल्ला खाली नहीं, इस पारधी लोगों को बाल बच्ची कामाने के लिए देते तो हमें काम की तलाश नहीं करनी पड़ती। आज एक लाल किसान को पुरानी एक जूही आर, सभी पारधी कर्मले बाहर चले गए।

ज्यादातर जंगल क्षेत्र के गांवों से पलायन

कसडोल के जंगल क्षेत्र गांव देवलराई, कडिया, मिर्दिगा, बालीनकली, लाल पावर, लखर, चालीकली, रैमदेव, देवरी, बजर, बजरानी, चारी, अमरलाल, कोट, देवरी आदि गांवों से पलायन हुआ है एवं आज भी लोग काम की तलाश में जाते जा रहे हैं। क्षेत्र में मजदूर पलायन बढ़ता है।

कसडोल, बल स्टैंड पर रोजाना इस तरह घर-घर छोड़कर जाते लोग बिल जायेंगे।

परिवार के साथ 22 छात्र-छात्राएं भी गए

इस गांव में पारधीक शाल एवं पूर्ण माध्यमिक शाल है जहां कक्षा: 67 और 47 बच्चे पढ़ते हैं जिसमें 22 बच्चे पलायन कर गए हैं कुछ बच्चे नियमित अनुपस्थित रहते हैं। पलायन के कारण इन बच्चों की पढ़ाई भी प्रभावित हो रही है। इस पर शासन को ध्यान देना आवश्यक है।

संडी में काम प्रारंभ कराया जाएगा

पलायन रोकने गांवों में रोजगारमूलक कार्य चलाने हैं काम संडी में कार्य करे नहीं चल रहा है। इसकी जानकारी लेकर यहां भी कार्य चलाना जायेगा। इस ही पारधी लोगों को बाल बच्ची भी डाले जा रहे हैं।

यहां गांव की निस्तारी करता है तथा पीने का पानी भरता है। गांवों के दिनों में ये जोर भी जवाब देते हैं। ग्रामीणों का

कहना है कि यहां पलायन बन जाये तो तो निस्तार का भी काम हो जायेगा और जल स्तर भी बढ़ेगा।

Coverage of Dainik Bhaskar after the launching of programme – 23.02.2018 (Migration rate reduced by FFP initiatives)

रायपुर की एक्सक्लूसिव सब्स

स्टेट फैक्ट

भास्कर विशेष **रायपुर**

24 लाख निर्माण प्रतिकों, असंगठित प्रतिकों और संगठित प्रतिकों का नवीन प्रदेश में किया जा चुका है। उन्हें और उनके परिवार के सदस्यों के लिए लगभग 72 प्रकार की कल्याणकारी योजनाएं संचालित की जा रही हैं।

खेती के बाद भी होता था इन 5 गांवों से पलायन, कड़कनाथ ने बदल दी जिंदगी

राजधानी के बाजार में जन्म नगर आगे बसर के मशहूर कड़कनाथ

भस्कर न्यूज/रायपुर

राजधानी से 100 किलोमीटर दूर कसडोल के पांच आदिवासी गांव। दो साल पहले तक जनवरी का महीना शुरू होते ही खेती का काम बंद और गांव में सन्नाह पसर जाता था। गांव के 500 परिवारों में कुछ को छोड़कर सब अपने बच्चों को लेकर काम की तलाश में देर के बड़े-बड़े शहरों में चले जाते थे। पर इस साल ऐसा नहीं है। एक-दो परिवार को छोड़कर सब गांव में हैं। कोई कड़कनाथ की फार्मिंग कर रहा है तो कोई और राजधानी नरस के बच्चों की। गांव की परिवारों में हजारों कड़कनाथ पसले देखकर हर कोई हैरान रह जाता है। बसल को सोमनाथ तक सीमित रहने वाला कड़कनाथ

अब जल्द ही राजधानी के बाजार में नगर आएगा। उद्योग जैकट स्टेट जंक्शन सेक्टर के इन्फोटेक उद्योग कुमर, डॉ. लखत चौहान और डॉ. पी जैकेल ने बताया कि गांव के दर्जनों परिवार मशरूम की खेती भी करने लगे हैं। खेती को ऐसी आधुनिक तकनीक उनके पास है कि कौटो को पोलिथिन के बैग में कैद करके उन्हें नष्ट कर रहे हैं। जुलाई के लिए ऐसे उपकरण का उपयोग कर रहे हैं कि एक बार के पाने में दो बार खेती उग रहे हैं। इसी सुविधाओं ने गांव का पलायन बंद कर दिया है। गांव वाले अपने पैरों पर खड़े हो रहे हैं। ग्रामीणों को खेती को आधुनिक सुविधाओं के साथ कड़कनाथ और राजधानी नरस के ऊंचे, लंबे कान वाले बकरे शहसन की और उपलब्ध कराए गए हैं। जो भी पूरी तरह से मुन। इतना ही नहीं ग्रामीण को कर्मा का हिस्सा भी शहसन को नहीं देना होगा। कड़कनाथ और बकरो की बिक्री

को पूरी कर्मा गांव वालों की होगी। दरभंग केंद्र सस्कर ने फर्म इन्वेस्टम सिसेस साइंस एंड टेक्नोलॉजी प्रोग्राम के तहत कसडोल के बकला, बमनी, खारहा और गांव का चयन किया है। उसी प्रोग्राम के तहत इन पांच गांवों के 500 परिवारों को पांच हजार कड़कनाथ की हर परिवार को राजधानी नरस की एक-एक बकरी मिलकुल मुक्त में दी गई। गांव वालों के साथ काम किया गया कि कड़कनाथ के अंठों से बच्चे होने के बाद ही वे इस नरस को उन्हें शहसन की ओर से दी गई है, उसको बिक्री करे। अंदो से आने वाले कड़कनाथ को बहुरागी और इसी तरह से फार्मिंग का कारोबार करते रहें। गांव वाले इसी फार्मिंग पर अमल कर रहे हैं। कड़कनाथ इस सड़न के हो चुके हैं कि उन्हें बाजार में बिक्री के लिए उतारा जा सके। अब उन्हें जल्द राजधानी में लाना बेचा जाएगा।

मशरूम की खेती और राजस्थानी नरस के बकरो की फार्मिंग भी कर रहे ग्रामीण

पिडडे गांव में प्रोजेक्ट

कैड स्टावर वे देकर के समेत पिडडे गांव ऐसे गांवों में प्रोजेक्ट लागू किया है, जहां के लोग परंपरागत तरीके से ही खेती करते हैं। खेती के बाद शहसन को लेकर और वे काम की तलाश में दूसरे शहरों में पलायन करते हैं। ऐसे गांवों की तलाश के लिए सर्वे किया गया। उसके बाद गांववालों को बैक लेकर कसडोलिंग की गई। कामीन और पलायन की नहीं के बरब एक साथ पांच कार्यक्रम लागू किए गए। पूरा प्रोजेक्ट केंद्रीय कृषि मंत्रालय की ओर से चलता जा रहा है।

योजना में धारा

- बकरो के लाने गांव में कड़कनाथ। बकरो की खान बल नष्ट और राजस्थान से लाने गई।
- गांव में कसडोलिंग सेक्टर। खेती और फार्मिंग की नई तकनीक की जानकारी दे रहे।
- 2018 से रायपुर प्रोजेक्ट। अब 2018 में आकर से चुका और उसके नतीजे आ रहे।
- बेहद खजारी से चालू किया गया बा बायोट प्रोजेक्ट।
- खेती बचाने के लिए खास तौर से खेती को पॉलीथिन की डिस्क में कैद करते हैं कामीन।



Major technological changes after the project

| S. No. | Particulars | Before | After |
|-----------|--|---|--|
| 1. | Cropping intensity | 100% | 120% |
| 2. | Major Agricultural technologies | | |
| a. | Goat | Desi breed | Sirohi, Jamunapari, Barbari breed with scientific farming practices |
| b. | Poultry farming | Desi breed, household consumption | Kadakhnath breed, with scientific farming technology, Pucca shade, Hatchery units |
| c. | Vegetable Cultivation | Local varieties, Traditional Practices | Improved varieties from IIHR, TNAU, NSC, Beej Nigam, IGKV, and KVKs, Scientific practice, Poly house, Drip irrigation, poly mulching and post-harvest technology |
| d. | Pulses and oilseed crops | Local variety, very less area through Utera cropping only | Improved variety like - Lathyrus (Prateek and Mahateoda), Chick pea (Vaibhav, JAKI 9218 and JG-11,12), Black gram (Azad - 03), Mustard (Indira Sarson, Pusa Jay Kisan and Pant Pili Sarson), Lentil (KLS - 218) and Linseed (RLC-92) in rice fallow, using with Happy Seeder and Aqua-Ferti Seed Drill |
| e. | Rice cultivation | Local Varieties, Traditional cultivation practices | Improved varieties such as - Chandrahasini, IGKV R-1, IGKV R-2, Indira Aerobic, Swarna, HMT, Mahamaya and Indira Barani with SRI technology and scientific package of practices |
| f. | Agro-based enterprise | Nil | Established – 04 Agro-processing Centers, 05 Custom Hiring Centers, 05 Kadakhnath Hatchery units |
| g. | Availability of Farm machinery | Limited availability from nearby farmers and villages | Established five Custom Hiring Centers (CHCs) with variety of drudgery reduction equipments and highly useful farm machinery |
| 3. | Source of Information | TV, Radio, Mobile, Local leaders | Farmer Communication Centers (FCCs), Farmers Scientist Interface, Agricultural Film Shows (AFSs), Mobile App, WhatsApp group, Facebook page, YouTube Channel |
| 4. | Additional income | Only farm (rice) income | Rs.12054/- additional income generated per farm family |

Major Infrastructure/ structure developed to the remote tribal villages

1. Farmer Communication Centers (FCCs)
2. Custom Hiring Centers (CHCs)
3. Kadaknath Farming Cum Hatchery Units
4. Agro-Processing Centers
5. Village Soil Testing Unit
6. Model Mushroom Production unit
7. Low-Cost Shade Net and Poly House
8. Modern Nutritional Terrace Gardening

Nutritional Improvements

For the nutritional security and to improve nutritional uptake in the diet, we have introduced and demonstrated nutritional home gardening with the improved vegetable seed kit (Arka Mega Seed Kit), introduced nutritive-rich high value Kadaknath chicken, promoted goat farming with improved breed, introduced and demonstrated low ODAP lathyrus variety and improved varieties of chickpea, lentil, black gram for rice fallow pulses, demonstrated clean milk production technologies and feed management for the livestock, introduced mushroom cultivation and established four model production unit promoted to farm women and rural youth to continue and scaling up the interventions. After the introduction of above interventions, the availability of food material for the day-by-day uptake in the diet was improved every year, which has been recorded and presented in the table. Table shows that the farmers adopted the interventions and improved their nutrient uptake.

| SI. No. | Particular | Year wise availability | | | |
|---------|---------------------------------|------------------------|---------|---------|---------|
| | | 2016-17 | 2017-18 | 2018-19 | 2019-20 |
| 1. | Cereals (kg/month/household) | 37.27 | 38.87 | 39.05 | 39.62 |
| 2. | Pulses (kg/month/household) | 05.13 | 5.50 | 05.77 | 06.37 |
| 3. | Milk (lit/month/household) | 15.85 | 15.85 | 17.12 | 17.95 |
| 4. | Egg (no.s/month/household) | 09.60 | 12.07 | 10.75 | 10.90 |
| 5. | Meat (kg/month/household) | 02.28 | 02.86 | 02.72 | 02.70 |
| 6. | Fish (kg/month/household) | 01.95 | 02.01 | 02.53 | 02.51 |
| 7. | Fruits (kg/month/household) | 04.88 | 04.86 | 05.20 | 05.96 |
| 8. | Vegetables (kg/month/household) | 33.36 | 34.76 | 35.52 | 36.65 |

Major technological changes after the project

| S. No. | Name of publication | Subject matter of publication |
|--------|----------------------------------|--|
| 1. | Extension Folders | <ol style="list-style-type: none"> 1. टमाटर, भिंडी एवं मिर्च में फल छेदक प्रबंधन 2. चने के नाशीकीट एवं उसका प्रबंधन 3. ऑयस्टर मशरूम उत्पादन तकनीक 4. भंडारगृह/गोदामों में प्रमुख नाशीकीटों व चूहों का प्रबंधन 5. ट्राइकोकार्ड : नाशीकीट प्रबंधन में प्रभावी तकनीक 6. Integrated Rat Control 7. Gadgets in Storage Pest Management 8. Pests of Chili and Their Management 9. Pests of Cole Crops and Their Management 10. Pests of Brinjal and Their Management 11. Pests of Cucurbits and Their Management 12. Pests of Okra and Their Management 13. Pests of Tomato and Their Management 14. Farmers' Best Pest Management Traps 15. अजोला उत्पादन तकनीक 16. कृषि कीटों का जैविक नियंत्रण 17. दान में तनाछेदक कीट, जानकारी एवं नियंत्रण 18. सब्जियों के लिए नर्सरी (पौधशाला) उत्पादन तकनीक 19. पैरा मशरूम उत्पादन तकनीक 20. तिवड़ा (लाखड़ी) उत्पादन तकनीक 21. गृह वाटिका द्वारा पोषण नियंत्रण 22. कृषि रसायनों का सुरक्षित उपयोग एवं रखरखाव 23. हेचरी यूनिट में अंडे की हैचिंग 24. केंचुआ खाद उत्पादन तकनीक 25. पॉलीहॉउस में संरक्षित सब्जी पौध उत्पादन तकनीक 26. पौधों में आवश्यक तत्व एवं उनके कार्य |
| 2. | Instructional Video clips | <ol style="list-style-type: none"> 1. Low-cost Azolla production 2. Goat farming 3. Kadaknath poultry farming 4. Rice fallow pulses production 5. Seed treatment 6. Oyster mushroom production <p>Available at - https://www.youtube.com/channel/UCX1-bmvrro_yqrNv0WIKxrw</p> |

| | | |
|-----------|---|---|
| <p>3.</p> | <p>Success Stories in ICAR Magazines</p> | <p>1. Azolla: The super plant for sustainable feed production. <i>Indian Farming</i> 69(06): 26–27; June 2019</p> <p>2. Happy Seeder - A Promising Technology in Conservation Agriculture HARIT DHARA 1(1) July 27-29- December, 2018</p> <p>3. Sustainable livelihood through high-value Kadaknath poultry farming. <i>Indian Farming</i> 69(06): 16–17; June 2019</p> <p>4. In Chhattisgarh Grass pea cultivation in rice fallow fetches more return. <i>Indian Horticulture</i>,5-7, May–June 2019</p> <p>5. Oyster mushroom cultivation for resource poor tribal farmers. <i>Indian Horticulture</i>,13-14, May - June 2019</p> <p>6. Arka Rakshak tomato to solve farmer woes. <i>Indian Horticulture</i>, 8-9, May - June 2019.</p> |
| <p>4.</p> | <p>FFP Photo Atlas</p> |  <p>The image shows the cover of the 'Farmer FIRST Innovation' photo atlas, which features a woman holding a green fruit. The text on the cover includes 'Farmer FIRST Innovation', 'A role model for doubling of Chhattisgarh tribal farmers' income', and 'ICAR NATIONAL INSTITUTE OF BIOTIC STRESS MANAGEMENT'. To the right is a 'Contents' page with a grid of small photos and a list of sections with page numbers: Introduction (21), Summary (22), Impact / Outcome (23), Project Site (24), Crop Based Module (25), NRM Based Module (26), Horticulture Based Module (27), Livestock Based Module (28), Enterprise Based Module (29), ICT Initiatives (30), Women Empowerment Initiatives (31), Clusters of Capacity Building Programmes (32), Dignitaries Visited (33), Awards Received (34), Farmers' Migration Reduced by FFP Intervention (35), SCP Facilitated during COVID-19 Pandemic (36), and Agri-advisory Services during COVID-19 at Project Site (37).</p> |
| <p>5.</p> | <p>Annual Crop Calendar</p> | <p>Compiled and Published the annual agriculture crop calendar 2019, which is fulfilled with time and need based periodic agriculture information.</p> |

| | | |
|------------------------|---------------------------|--|
| <p>6. Social Media</p> | <p>a. Facebook Page</p> | |
| | <p>b. YouTube Channel</p> | |



| | | |
|-----------|------------------------------|--|
| <p>c.</p> | <p>WhatsApp Group</p> | |
| <p>d.</p> | <p>FFP Portal</p> | |

Technologies/interventions introduced and sustained in the Farmer's field

1. Agricultural Film Shows
2. Agro Processing Centers and Value addition of agro products
3. Low-cost Azolla Production
4. Line sowing through bhoramdav Seed Drill
5. Bio Fertilizers
6. Biyasi Plough
7. Bordeaux Mixture
8. Custom Hiring Centers (CHCs)



9. Farmer Communication Centers (FCCs)
10. Goat Farming with improved breed
11. Zero tillage through Happy Seeder
12. Aqua Ferti Seed Drill
13. Pheromone Traps
14. High-tech horticulture in Poly House
15. Poly Mulching
16. Scientific Pumpkin and ash gourd Production
17. Scientific Nursery Raising Technology
18. Scientific Vegetable Production
19. Seed Treatment
20. Village Soil Testing Unit
21. Trichocard for Eco-friendly Pest Management
22. Use of Biological Fungicide *Trichoderma viride*
23. Bio-logical pesticide through *Metarhizium anisopliae*
24. Utera Cropping of Pulses
25. Vaccination of Poultry and Livestock
26. Multiplication and Application of Waste Decomposer
27. Yellow and Blue Sticky Traps
28. SRI (System of Rice Intensification)
29. Mechanical Weed Management in Rice
30. Plant Propagation Technologies
31. Bund Farming
32. Establishment of Fruit Orchard
33. Strawberry Cultivation under Poly House
34. Flower Cultivation
35. Fodder Crop Production
36. Inter-cropping Techniques
37. Denavaling practice in Banana
38. Scientific Vegetable Cultivation
39. TNAU Gadgets to control storage pest
40. Popularization and application of Agriculture mobile app and Interactive Educational Multimedia Module (IEMM)
41. Safe use of Agro-chemicals
42. Scientific Turmeric Production Technology



Summary of Farmer FIRST Project (2016-2022)

| S. No. | Particulars | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|--|----------------------|-----------------------|-----------------------|---------------------|--------------------------|--------------------------|
| 1. | Total Budget (Rs.) | 26,80,000 | 25,70,000 | 28,80,000 | 19,45,000 | 16,75,000 | 31,25,000 |
| 2. | Expenditure (Rs.) | 26,47,287 | 23,36,448 | 28,60,738 | 17,65,569 | 16,45,049 | 30,87,859 |
| 3. Capacity Building Programme | | | | | | | |
| A | Training | 4/120 farmers | 29/870 farmers | 41/1089 farmers | 34/889 farmers | 23/322 farmers | 61/917 farmers |
| B | Demonstration | 10/157 farmers | 31/465 farmers | 25/478 farmers | 51/802 farmers | 16/264 farmers | 33/808 farmers |
| C | Gosthi and group discussion | 0/0 farmers | 14/490 farmers | 16/276 farmers | 21/544 farmers | 06/82 farmers | 13/196 farmers |
| D | Exposure Visit | 1/55 farmers | 02/42 farmers | 03/42 farmers | 01/16 farmers | 02/18 farmers | 02/26 farmers |
| E | Farmers Scientist interface | 1/85 farmers | 02/88 farmers | 04/202 farmers | 02/112 farmers | 02/39 farmers | 12/619 farmers |
| F | Agricultural Film Shows | 0/0 farmers | 14/580 farmers | 9/370 farmers | 08/336 farmers | 10/94 farmers | 12/142 farmers |
| 4. | Total farmers Covered in CBP | 417 farmers | 2535 farmers | 2457 farmers | 1794 farmers | 819 farmers | 2708 farmers |
| 5. | Technology Introduced | 09 | 29 | 38 | 52 | 54 | 54 |
| 6. | Area Covered under Pulses | 0 | 40ha/180 farmers | 32ha/154 farmers | 30/150 farmers | 2750/66 farmers | 42/167 farmers |
| 7. | Area Covered Under Vegetable | 2 ha. /36 farmers | 12ha/110 farmers | 18ha/300 farmers | 06/35 farmers | 44/86 farmers | 8.5/64 farmers |
| 8. | Area Covered Rice Production | - | - | - | - | 28.80/70 farmers | 54/76 farmers |
| 9. | Household covered | 154 | 502 | 612 | 622 | 625 | 634 |
| 10. Income generated per farm family (Rs.) | | | | | | | |
| A | Crop Based Module | 0 | 6,821 | 9,850 | 24,542 | 18,200 | 22,600 |
| B | Livestock Based Module (Kadakhnath+Goat) | 0 | K 23,692+ G 16,282 | K 20,042+ G 39,150 | K 48613+ G 3,212 | K 1,53,166 + G 24,200 | K 1,50,000 + G 21,750 |

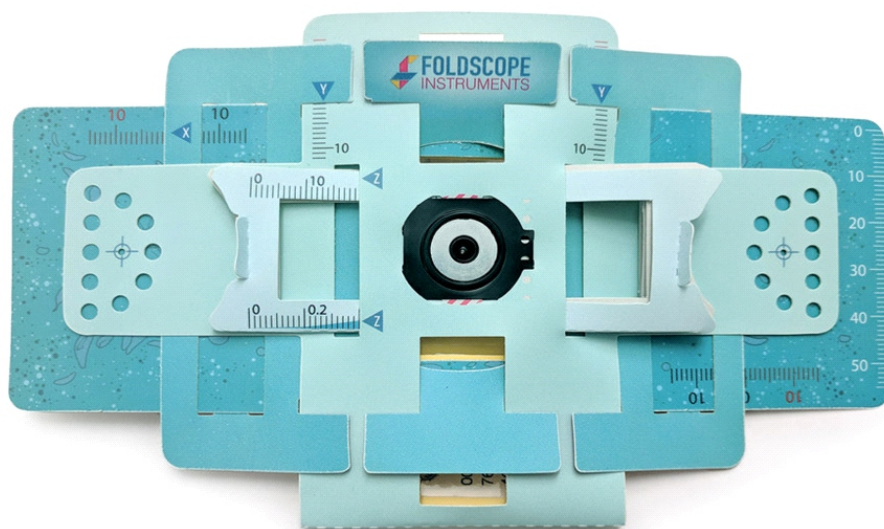


| | | | | | | | |
|---|---------------------------|-------|-------|--------|--------|--------|--------|
| C | Horticulture Based Module | 7,600 | 6,000 | 12,722 | 5,400 | 8,600 | 6,500 |
| D | Enterprise Based Module | 4,200 | 6,250 | 14,000 | 18,240 | 23,320 | 36,000 |
| E | NRM Based Module | 2,300 | 4,650 | 3,650 | 2,035 | 4,200 | 3,600 |



VI. Foldscope Programme

Foldscope: Origami-Based Paper Microscope: Foldscope is the ultra-affordable, paper microscope weighs only 8 grams. It is designed to be extremely portable, durable, and to give optical quality similar to conventional research microscopes (magnification of 140X and 2-micron resolution), Foldscope brings hands-on microscopy to new places. The magnification power is enough to enable the spotting of organisms such as *Leishmania donovani* and *Escherichia coli*, as well as malarial parasites. Foldscope can be used to observe biological samples like bacteria, copepods, tardigrades, tetrahymena, diatoms, rotifers, nematodes, spider eggs, ants, vorticella, mites, daphnia etc. Foldscope can also allow the observation of non-biological samples, such as particulates detrimental to air quality, or the microscopic crystalline differences between real and fake medications. The Foldscope comes in a kit with multiple lenses that provide magnification from 140X to 2,000X. A Foldscope can be printed on a standard A4 sheet of paper and assembled in seven minutes. It is part of the "frugal science" movement which aims to make cheap and easy tools available for scientific use in the developing world. Foldscope was invented by Manu Prakash and Jim Cybulski at the Department of Bioengineering, Stanford University, California, USA in 2014 and designed to cost less than US\$1 to build. Foldscope can be coupled with smart phones to capture images and videos through in build magnetic couplers. The LED light attachment is very unique and useful to provide phase contrast like view for visualizing any sample mounted on a microscope slide. We have received the grant from DBT and DST SYST under Foldscope research initiatives.



Foldscope - The Origami-inspired Paper Microscope

Identification and diagnostics of the plant diseases at field level is always a problem to farmers and they are mostly dependent on the local pesticide shopkeepers. Diagnosis of crop diseases at initial level, it's very helpful to minimize the crop yield losses of farmers and also reduces the input cost, foldscope microscopy may be the solution for this. Under this project, we have explored the socio-economic status, knowledge level of rural farmers on plant pathogenic diseases and farmer's attitude/perception towards foldscope microscopy.

Infected fungal plant samples were observed in field condition and identified twenty six fungal and algal pathogens viz *Penicillium digitatum* (Green mould disease of citrus), *Botrytis spp* (Botrytis blight of brinjal), *Erysiphe polygoni* (Powdery mildew disease of mung bean), *Oidium erysiphoides* (Powdery mildew disease of ber), *Albugo bliti* (White rust disease of amaranthus), *Fusarium spp* (Damping off disease of tomato), *Puccinia recondita* (Brown rust disease of wheat), *Rhizopus spp* (Seedling blight disease of tomato), *Ustilago tritici* (Loose smut of wheat), *Alternaria lini* (Leaf blight disease of linseed), *Erysiphe cichoracearum* (Powdery mildew disease of muskmelon), *Golovinomyces cichoracearum* (Powdery mildew disease of sunflower), *Erysiphe spp* (Powdery mildew disease of coriander), *Erysiphe polygoni* (Powdery mildew of blackgram), *Leveillula taurica* (Powdery mildew disease of fenugreek), *Alternaria carthemi* (leaf blight of Safflower), *Alternaria spp* (Post-harvest fruit rot disease of mango), *Cephaleuros virescens* (Red rust disease of mango), *Ustilaginoidea virens* (False smut of rice), *Magnaporthe grisea* (Blast disease of rice), *Alternaria brassicicola* (Leaf spot of cabbage), *Alternaria melongenae* (Alternaria leaf spot of brinjal), *Alternaria brassicae* (Alternaria leaf blight of mustard), *Alternaria solani* (Early blight of tomato), *Alternaria porri* (Purple blotch of onion) and *Cercospora spp.* (Leaf spot of okra). We have also two bioagents *Trichoderma viride* (Indira Trichoderma) and *Pacelomyces lilacinus* (Entomopathogen) observed in situ under Foldscope. Mostly foliar fungal diseases were identified but root pathogens (*Fusarium* and *Rhizoctonia*) were not diagnostic under the foldscope microscopy in field condition.

As a capacity building initiative 21 (twenty-one) event organized on foldscope demonstration cum hands-on training, awareness campaign on in-situ diagnosis of plant pathogenic fungi through Foldscope microscope to rural farmers, youth, college students, agriculture extension officers, horticulture extension officers and teaching faculty of institute. Totally, 573 participants were benefitted from this initiative, in which 174 are rural farmers, 46 are female farmers, 305 are college students and 48 are agricultural extension officers and Scientist/ Professor of agriculture. Thirty-one rural youths as well as students are trained at field level to demonstrate the foldscope microscopy to the needy people. We have posted (23) various picture of fungal plant pathogens and capacity building initiative activities in online platform of MICROCOSMOS Foldscope Community.



Capacity Building Programmes

| S. No. | Particulars | No. of Activity | Participants | | | | Total participants |
|--------------|---------------|-----------------|--------------|---------------|------------|-----------|--------------------|
| | | | Male Farmer | Female Farmer | Students | Officers | |
| 1. | Training | 5 | 38 | 7 | 83 | 15 | 143 |
| 2. | Demonstration | 16 | 136 | 39 | 222 | 33 | 430 |
| Total | | 21 | 174 | 46 | 305 | 48 | 573 |

- **Under DBT initiatives:** Number of training cum demonstration conducted: 19, Number of tribal farmers / students trained: 846 and Number of trainers created: 7

Area Covered: Under the project all capacity building programme conducted in different district of Chhattisgarh state viz. Janjgir-Champa, Rajnandgaon, Baloda Bazar, Dhamtari, Durg and Raipur. We have also done training and demonstration programme in various agricultural and educational institute.

Activities of awareness and capacity building programme under project



Youth farmers using of Foldscope at their farm field



Hands on training to rural farmers on Foldscope microscope



Awareness campaign on diagnosis of plant disease to rural farmers at KVK Rajnandgaon



Hands on training to rural youth on Foldscope microscope



Demonstration of Foldscope microscope to RHEO at KVK Janjgir-Champa



Hands on training of plant disease diagnosis through Foldscope microscope to RHEO



Demonstration of plant disease diagnosis using mobile phone-based Foldscope microscopy



Demonstration of Foldscope microscope to RAWE students

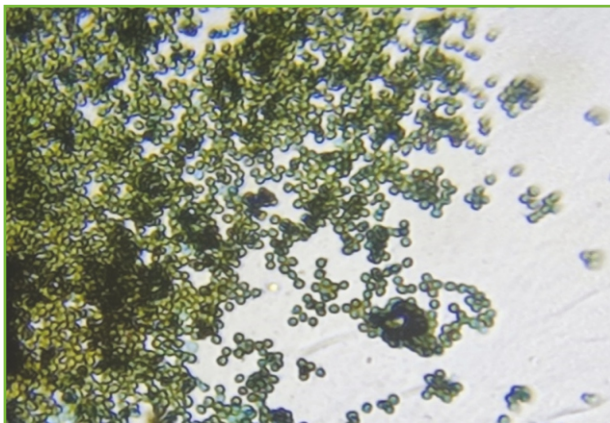


PG and PhD students of Plant Pathology Interacting from Foldscope microscope at COA, Raipur

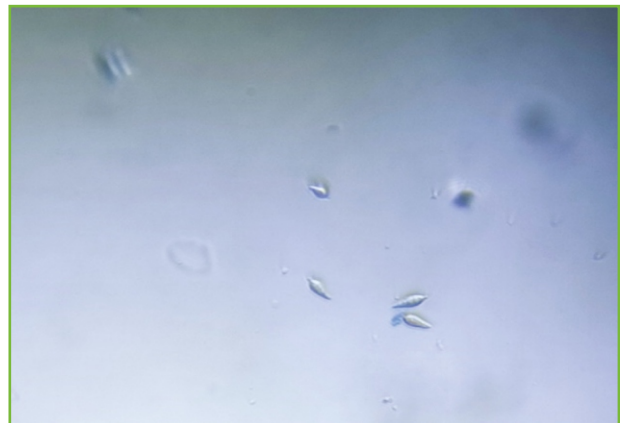


Students focusing slide samples under Foldscope along with their mobile phone

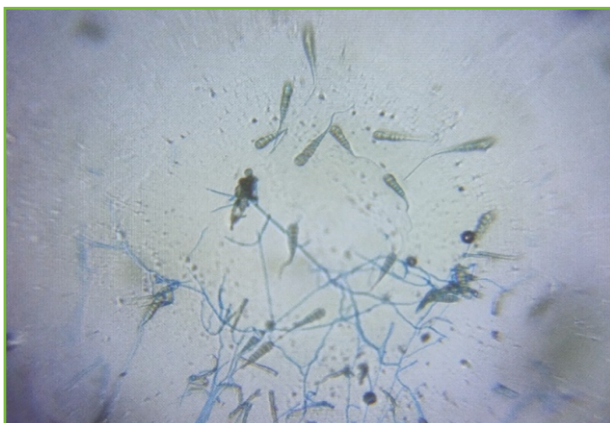
In situ diagnosis of plant pathogens under Foldscope microscope



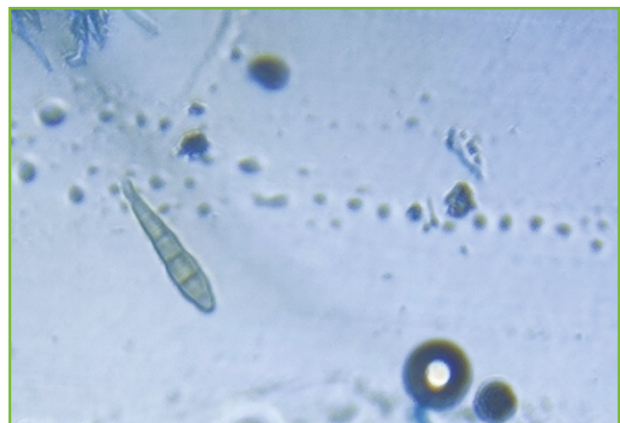
Ustilagoideae virens (False smut of rice) observed under Foldscope



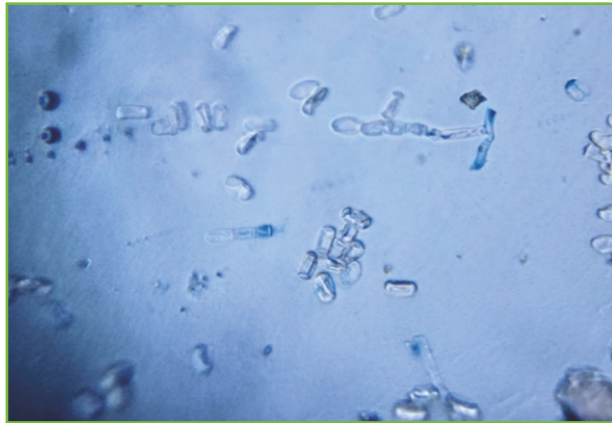
Magnaporthe grisea (Blast disease of rice) observed under Foldscope



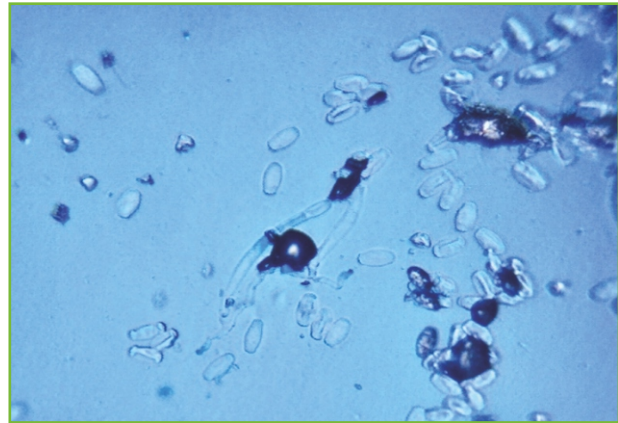
Alternaria lini (Alternaria leaf spot disease of linseed) under Foldscope



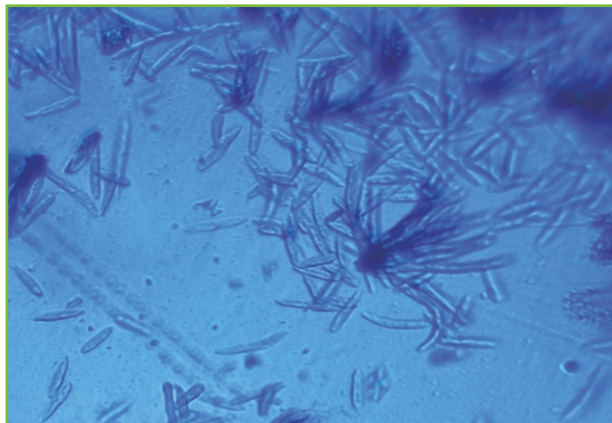
Alternaria brassicicola (Leaf spot of cabbage) observed under Foldscope



Erysiphe cichoracearum (Powdery mildew disease of muskmelon)



Golovinomyces cichoracearum (Powdery mildew disease of sunflower)



Cercospora spp (Leaf spot of okra)
observed under Foldscope



Leaf spot disease of okra

Field level application of Foldscope:

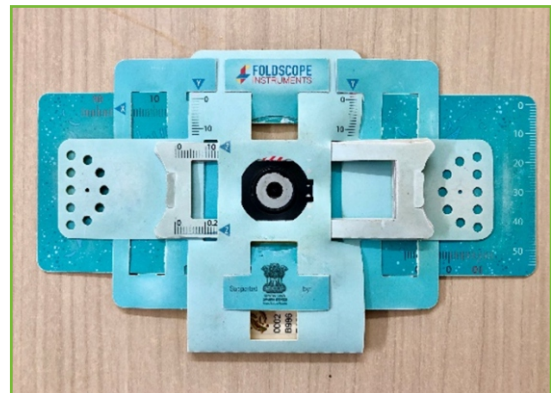
Assessment of frozen semen quality through foldscope microscopy - A novel application of frugal science to reduce the infertility rate

Quality determination of frozen semen before using for Artificial Insemination (AI) in cattle is of paramount importance. The success of cattle AI programs largely depends on the use of good quality semen and assessing the its quality parameters before AI which reduces costs and time of reproductive programs. Semen should be evaluated as soon as possible after collection to avoid the changes due to exposure of light, chemicals, lubricants etc. Henceforth, vitality, motility and morphology of the spermatozoa are the initial quality parameters judging semen quality (Saroj Rai, *et al.* 2019). In the present context, many of

our government AI sub-stations are not equipped with proper semen diagnostics facility. Hence, assessment of frozen semen quality before AI at field level is major impediment. Further, the possibility for the contamination and poor storage of semen straws will results inferior quality parameters which will end up with repeat breeding problem. Pre-insemination quality evaluation of each dose of semen being used in the field for AI is very essential. With this background, in the present study the Foldscope has been used to evaluate the frozen semen quality at field level. Foldscope used to test the semen quality (mass motility) before AI; the observation was very fruitful and we have seen the mass motility of spermatozoa. Mass motility of spermatozoa and its progressive movement has been observed through foldscope. If the *ImageJ* or other image processing software developed for mobile version, the complete process of semen quality evaluation can be done in the field with minimal time and cost. This field application of foldscope will certainly increase the cenception rate of cattle per AI and save the money and time as well.



Parts of Foldscope in a A4 sheet



Foldscope

Plate 1: Parts of foldscope

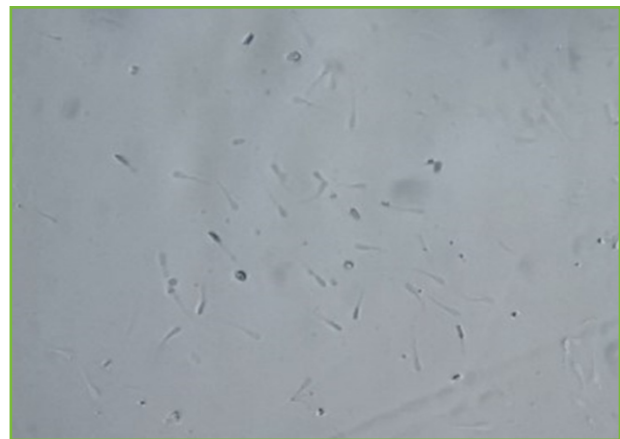


Plate 2: Images of mass motility of spermatozoa observed through foldscope



Plate 3: Training to Veterinary Assistant Surgeon (VAS) for field level diagnosis of semen quality through foldscope microscopy

Publication Under Project:

1. Popular Articles Published Under DST-SYST

- फोल्डस्कोप माइक्रोस्कोप: फसलों के रोगों के पहचान में महत्वपूर्ण भूमिका (Foldscope Microscope: Important role in identification of crop diseases)
Author- P. Mooventhan, Manoj Kumar Sahu, Yogita, Uttam Singh, Rewendra Kumar Sahu and H.K. Singh (Article- Ropan, Volume- 01, Issue -September 2021, Page no.- 23)
- कृषि में नवाचार पेपर आधारित माइक्रोस्कोप- फोल्डस्कोप (Inovation in agriculture paper based microscope-Foldscope)
Author- P. Mooventhan, Manoj Kumar Sahu, Yogita, Uttam Singh, Rewendra Kumar Sahu and H.K. Singh (Article- Ropan, Volume- 01, Issue -February 2022, Page no.- 32-33)

2. Folders published under DST-SYST

- फोल्डस्कोप माइक्रोस्कोप : फसलों के रोगों के पहचान में महत्वपूर्ण भूमिका (Foldscope microscope: important role in detection of crop diseases)
Prepared by: P. Mooventhan, Manoj Kumar Sahu, Yogita, Uttam Singh, Rewendra Kumar Sahu and H.K. Singh (Publication No. NIBSM/EF/2021-58)
- कृषि तकनीक में नवाचार पेपर आधारित माइक्रोस्कोप: फोल्डस्कोप (Innovation in agriculture technology paper-based microscope: Foldscope)
Prepared by: P. Mooventhan, Manoj Kumar Sahu, Yogita, Uttam Singh, Rewendra Kumar Sahu and H.K. Singh (Publication No. NIBSM/EF/2021-57)

Tribal farmer's attitude towards Foldscope microscopy

(n=150)

| Sl. No. | Category/perception | Yes | | No | |
|---------|--|-----|-------|-----|-------|
| | | Nos | % | Nos | % |
| 1. | Foldscope is useful to learn new things | 150 | 100 | 0 | 0.00 |
| 2. | Handling of foldscope is easy | 96 | 64.00 | 54 | 36.00 |
| 3. | Availability of foldscope is difficult | 124 | 82.66 | 26 | 17.33 |
| 4. | Foldscope is apt for school / college students | 97 | 64.66 | 53 | 35.33 |
| 5. | Training is necessary to use Foldscope | 150 | 100 | 0 | 0.00 |
| 6. | Is any modification required in the Foldscope | 71 | 47.33 | 79 | 52.66 |
| 7. | Cost of the foldscope is affordable | 150 | 100 | 0 | 0.00 |
| 8. | It's difficult to observe samples through foldscope without using smartphone | 43 | 28.66 | 107 | 71.33 |
| 9. | Foldscope should be placed in the village level health centres for initial diagnosis | 128 | 85.33 | 22 | 14.66 |
| 10. | Slide making is difficult | 134 | 89.33 | 16 | 10.66 |

News clippings of Foldscope workshop for **Nicobarese tribes** at Harminder Bay (Hutbay), Little Andaman, A&N Islands.

The screenshot shows a news article on the ICAR website. The article is titled "Workshop for Nicobarese Tribal Farmers on Foldscope Microscopy" and is dated 20th March, 2019, Raipur. The text describes a one-day workshop organized by the ICAR-National Institute of Biotic Stress Management (NIBSM) in Raipur for tribal farmers in Harminder Bay, Little Andaman. The workshop focused on the use of Foldscope microscopy for diagnosing plant diseases and ensuring personal hygiene. The article mentions that the workshop was organized in collaboration with the ICAR-Central Island Agricultural Research Institute, Port Blair. The Chief Guest, Smt. Khri Hilton, First Captain, Tribal Council, Harminder Bay, expressed her gratitude for the introduction of this novel and frugal technology. The workshop was attended by 51 Nicobarese tribal farmers, including 11 females. The Foldscope is described as an ultra-affordable, paper microscope that is portable and durable, with a magnification power of 140X and 2-micron resolution. It is noted that the Foldscope can be printed on a standard A4 sheet of paper and assembled in seven minutes. The article concludes by stating that this is part of the "frugal science" movement, which aims to make cheap and easy tools available for scientific use in the developing world. The source is cited as ICAR-National Institute of Biotic Stress Management, Raipur.



पाट ब्लेयर: मध्यांतर अडमान जल के मायाबंदर स्थित महात्मा गांधी राजकीय महाविद्यालय में चुनाव से संबंधित विषयों पर प्रश्नोत्तरी प्रतियोगिता का आयोजन किया गया। इस मौके पर जिला उपायुक्त व जिला निर्वाचन अधिकारी अवनीश कुमार

मुख्य आतिथ के रूप में उपास्थित रह। प्रश्नोत्तरी प्रतियोगिता को संबोधित करते हुए उन्होंने कहा कि लोकतंत्र की मजबूती के लिए युवाओं को आगे आने की आवश्यकता है। उन्होंने भारत के लोकतंत्र को मजबूत बनाने के लिए स्वतंत्र, निष्पक्ष एवं पारदर्शी चुनाव के

कराने का बात का। उन्होंने एक भा मतदाता ना छूटे इस लक्ष्य को पूरा करने की भी बात कही। इस मौके पर महाविद्यालय के प्रचार्य डॉ. प्रभुराम ने सभी का स्वागत करते हुए मजबूत लोकतंत्र के लिए चुनाव में मतधिकार के महत्व पर बल दिया।

आदिवासी किसानों के लिए हरमिंदर बे में कार्यशाला

सन्मार्ग संवाददाता
पोर्ट ब्लेयर: आईसीएआर-नेशनल इंस्टीट्यूट ऑफ बायोटिक स्टेट मैनेजमेंट रायपुर तथा केंद्रीय द्वीपीय अनुसंधान संस्थान की ओर से लिटिल अंडमान के हरमिंदर बे में आदिवासी किसानों के लिए हालही में एक दिवसीय कार्यशाला आयोजित की गई। कार्यशाला का उद्देश्य जूनेटिक रोगों के जौखिम

को कम करने तथा फोल्डस्कोप माइक्रोस्कोपी के माध्यम से व्यक्तिगत स्वच्छता सुनिश्चित करने के लिए था। कार्यशाला का उद्घाटन आदिवासी परिषद के प्रथम कप्तान किन्नी हिल्टन ने बतौर मुख्य अतिथि किया। उन्होंने आदिवासी किसानों के लिए इस तरह कार्यशाला आयोजित करने के लिए संस्थानों का आभार प्रगट किया। कार्यशाला में अनुसंधान

के संयुक्त निदेशक व विशेषज्ञ डॉ. पंकज कौशल, डॉ. पी. मूवेनाथन, डॉ. एस. जमीर अहमद ने अपना विचार व्यक्त किया। कार्यशाला का आयोजन डॉ. एस.के. जमीर अहमद तथा डॉ. आर जया कुमार वर्धन के समन्वय में किया गया। इस मौके पर 31 महिला आदिवासी किसान तथा 51 पुरुष आदिवासी किसान उपस्थित थे।



हरमिंदर बे में किसानों के कार्यशाला में उपस्थित लोग

First Foldscope Workshop Jointly by ICAR- NIBSM & CIARI at Harminder Bay

andamansheekha.com/2019/03/25/first-foldscope-workshop-jointly-by-icar-nibsm-ciari-at-harminder-bay/

March 25, 2019 by sanjib Leave a Comment

March 25, 2019

ICAR- NIBSM & CIARI Jointly Conduct First Foldscope Workshop a... http://www.andamanchronicle.net/index.php?option=com_content&v

ICAR- NIBSM & CIARI JOINTLY CONDUCT FIRST FOLDSCOPE WORKSHOP AT HARMINDER BAY

Last Updated on 25 March 2019 By Denis Giles Hits: 77



Shailja @himdaughter · 19 Dec 2018

No electric: Yeh Taara youtu.be/9UzvpM3lwwY from Swadesh re-enacted in real time.

Cell images projected using #Foldscope through Night Film Shows at remote tribal village, Kharha, Chhattisgarh State

Conducted by Dr **Mooventhan** Palanisamy.

So so wonderful to see



Dr. Shailja Vaidya Gupta, Adviser to DBT, Gol has referred our work under this Foldscope project.



VII. DBT Biotech-KISAN Hub

Scientists work on problems that interest them. The world faces enormous challenges with large populations, diminishing resources and the consequences of climate change. Scientists are eager to address these problems and find implementable solutions but need to develop a close connect with society for the best solutions to emerge. One very difficult challenge is sustainable food security for all. Over the years, agriculture productivity of the country has been severely affected in both quality and quantity. The main reasons affecting productivity are:

1. **Water:** drought, flood, availability and poor quality are major issues.
2. **Soil:** poor soil health, lack of application of modern technologies in agriculture due to lack of knowledge and awareness, abiotic and biotic stress due to climate change,
3. **Seed:** lack of availability of quality agricultural planting material at affordable cost to small and marginal farmers,
4. **Market:** collapse of extension system for dissemination of new technologies among farmers, lack of use of available bio-resources at farm / village level for proper nutrient management and processing, packaging and marketing

The problems faced by the Indian farmer are special, small land holdings are the norm, a very small number of livestock which is often the primary source of livelihood and 15 different agro climatic zones. Solutions developed in the lab, primarily in the developed world do not necessarily address the problems faced by the Indian farmer.

There is a need for direct linkage between science laboratories and farms; it is now imperative that the Indian scientist understand the problems of the local farmer and provide solutions to those problems. Likewise, it is necessary to expose farmers to the scientific solutions available by bringing him to the scientific environment/laboratory. This close interaction and need based research will allow innovative solutions and technologies to be developed and applied at farm level.

2. OBJECTIVES:

“Biotech-Krishi Innovation Science Application Network (Biotech-KISAN)” will be implemented in 15 agro-climatic zones of India in phased manner with the objective:

- Linking available science and technology to the farm by first understanding the problem of the local farmer and provide solutions to those problems.
- The working together, in close conjunction, of scientists and farmers is the only way to improve the working conditions of small and marginal farmers.



- This programme aims to work with small and marginal farmers especially the woman farmer for better agriculture productivity through scientific intervention and evolving best farming practices in the Indian context.

3. COMPONENTS OF THE PROGRAMME

The Programme will provide support for following three components:

A. The Hub: Establishment of Biotech-KISAN Hub in each of 15 agro-climatic zones of the country under the leadership of a champion, who will act as a Facilitator. Each Hub will create a network by developing strong linkages with top quality scientific institutions / State Agricultural Universities (SAUs) / Krishi Vigyan Kendras (KVKs) / existing state agriculture extension services / system and other Farmers' organizations in the region as well as linkages with leading international institutions / organizations. Biotech-KISAN Hub will have a tinkering laboratory. The core activities of the Hub will include:

- Understanding the problems of the local farmer;
- Scouting for available technologies and solutions to problems of farmers in the region;
- Demonstration and scale-up programmes for implementing the solutions to the problems of farmers – addressing water, soil, seed and marketing issues;
- Creation of strong Scientists-Farmers Interaction Platform and connectivity; training programmes for the farmer and immersion programmes for scientists;
- Communication set up through radio and TV and connectivity through social media;
- Individual thematic fellowship programmes for selected farmers in the zone at high-tech science laboratories;
- Special solution-driven thematic fellowships to women farmers (*Mahila Kisan Biotech Fellowship*) to develop them as leaders and grass root scientists.

Establishment of **DBT Biotech-KISAN Hub** at ICAR-NIBSM, Raipur was implemented in the month of January 2020. Under this project, three aspirational districts namely Korba, Rajnandgaon and Mahasamund are allotted to execute the contemplated project objectives. The main objectives of this project is to popularization of improved rice varieties such as drought tolerant, BPH resistant varieties, nutri-rich rice varieties (developed through biotechnology approaches), application/use of bioagents (like *Trichogramma spp*, NPV, BT, *Trichoderma viride* and *Pseudomonas*) along with complete package of practice



at farmers' level in rice and pulses, demonstration of low-cost protected cultivation of vegetables such as coloured capsicum, cucumber and tomato and demonstration of scientific goat farming. In the first phase, we have covered 150 farm families from 15 cluster of villages and generated Rs. 18.79 lakhs of farmer's income through biofortified rice variety namely Zinco MS. Further, we have introduced 14 agricultural interventions in the Kharif season and farmers fully adopted the technologies as well. In addition, Lathyrus crop was demonstrated in the rice fallow to generate additional income with minimal input cost. As a capacity building initiative, we have conducted 150 field demonstration, 47 trainings and 55 farmer-scientist interfaces. Total 879 farmers benefited under this programme. As an economic impact, additional income of Rs. 12,500 per farm family was generated in the Kharif season. Further, we have introduced and demonstrated the promising interventions such as line sowing, transplanting of rice, seedling/seed treatment with biofertilizers, IPM, IWM, IDM, INM and post-harvest technology in the farmer's field. Total 60 hectares of farm land covered in the first phase. In the current *rabi* season, pulses and vegetable productions are planned and sowing was completed. Out of 150 farm families, 143 male and 7 female farmers are selected under this programme which includes 3 SC and 49 ST farmers.

Major Achievements

| | |
|-------------|--|
| In nutshell | <ol style="list-style-type: none"> 1. Total income generated: Rs. 37.38 lakhs/- (Rs. 24,920/FF) 2. Total coverage: 72 hectares 3. Total farm families covered: 150 (80 additional FF) 4. Total technological interventions introduced: 29 5. Successful Intervention: BFV, BCA, SVP, GF, LPC & RFP |
|-------------|--|

Brief Achievements

| Parameters | Response |
|--------------------|---|
| Major Objectives | To adopt and disseminate the biotech intervention to farmers under Biotech - KISAN project |
| Sub- Objective (s) | <ol style="list-style-type: none"> 1. Popularization of improved rice varieties such as drought tolerant, BHP resistant varieties, nutri-rich varieties (developed through biotechnological approaches). |



| | |
|---|---|
| | <ol style="list-style-type: none"> 2. Application/use of bioagents (like <i>Trichogramma spp.</i>, NPV, BT, <i>Trichoderma viride</i> and <i>Pseudomonas</i>) along with complete package of practice at farmer's level in rice and pulses. 3. Demonstration of low-cost protected cultivation of vegetable such as colored capsicum, cucumber and tomato. 4. Demonstration of scientific goat farming with the introduction of Sirohi, Jamunapari, Black Bengal and Barbari breeds. |
| Number of beneficiaries covered during review period | |
| (I) Activity-wise | 150 farmers |
| (ii) Gender-wise | 143 male and 07 female farmers |
| (iii) No. of SC/ST farmer beneficiaries | 8 (SC) and 49 (ST) farmers |
| (iv) No. of Reverse Migrant Farmers Returned to their villages during the COVID-19 Pandemic/Lock down | 57 |
| Major benefits accrued to the farmers | |
| (i) Economic | Rs. 37.38 lakhs/- (Rs. 24,920/FF) |
| (ii) Skill | Protected cultivation practices, NRM techniques and Scientific goat rearing practices. |
| (iii) Technological | Nutri-rich & Resistant varieties, Drudgery reduction and Biocontrol production |
| (iv) Entrepreneurship Developed | Three FPGs and One FIG (Vegetable, Goat and Biopesticides) |
| Number of Biotech-Kisan fellows selected and trained to become Master-trainers (Men & Women) | 16 (11/05) |



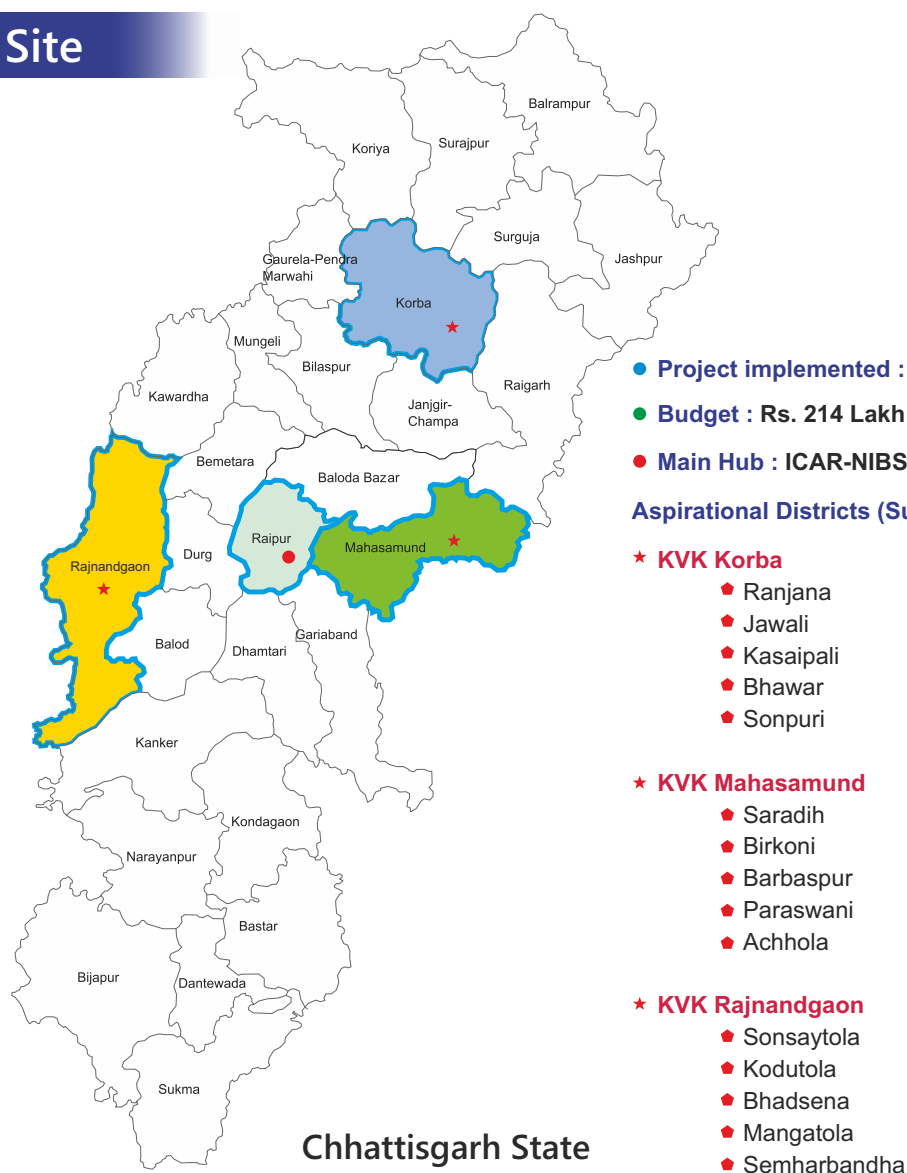
| | |
|--|---|
| <p>Initiatives undertaken for marketing of farmers' produce emanating from the Project</p> | <ul style="list-style-type: none"> • Linkage to e-Marketing for vegetables - (KVK-Rajnandgaon) • Zinco Rice MS processing and sale unit - (KVK-Mahasamund) • Native Biocontrol / Trico Card - (ICAR-NIBSM) |
|--|---|

Objective wise activities at field

| S. No. | Objective | Technology Intervened/ Activities |
|--------|---|---|
| 1. | <p>Popularization of improved rice varieties such as drought tolerant, BHP resistant varieties, nutri-rich varieties (developed through biotechnological approaches).</p> | <ul style="list-style-type: none"> • Cultivated Nutri-rich (Bio fortified) Zinco rice MS and DRR Dhan - 45 variety of high zinc content (26 PPM) • Cultivated Drought, insect-pest and diseases Tolerance varieties i.e. Rajeswari (IGKV R-1), Indira Maheshwari, Indira aerobic-1, MTU-1010, DRR Dhan - 42 variety in rainfed shallow lands. |
| 2. | <p>Application/use of bioagents (like Trichogramma spp., NPV, BT, Trichoderma viride and Pseudomonas) along with complete package of practice at farmer's level in rice and pulses.</p> | <ul style="list-style-type: none"> • Seed and seedling treatment with Bio-fertilizer/ Bio-agents (<i>Azospirillum</i>, Phosphate Solubilizing Bacteria (PSB), <i>Rhizobium</i>, <i>Pseudomonas Fluorescens</i>, <i>Trichoderma viride</i> and <i>T. harzianum</i>) • Integrated weed management (IWM) by <i>Coccinella septempunctata</i> • Integrated pest and diseases management (IPDM) |
| 3. | <p>Demonstration of low-cost protected cultivation if vegetable such as colored capsicum, cucumber and tomato.</p> | <ul style="list-style-type: none"> • Demonstrated low-cost insect proof net house and installed in nine farmers field for cultivation of horticultural crops such as Tomato (Arka Rakshak, Arka Samrat & Arka Apeksha), Cucumber (Krish) and Capsicum. |

| | | |
|----|--|--|
| | | <ul style="list-style-type: none"> Demonstrated and provided drip irrigation system with ventury and mulching film 30 micron to establish the high tech vegetable production. |
| 4. | Demonstration of scientific goat farming with the introduction of Sirohi, Jamunapari, Black Bengal and Barbari breeds. | Goat breed “Sirohi” were demonstrated and distributed to 12 household |

Project Site



Major achievements of DBT Biotech-KISAN Hub at ICAR-NIBSM, Raipur (2020-22)

- Total **72 hectares** of land covered under biofortified rice cultivation, rice fallow pulse and vegetable production with poly-mulch and drip system.
- Total **150 (80 additional)** farm families covered during 2021-22 which includes 8 SC and 49 ST farm families.
- Total 29 technological interventions introduced at farmer's field.
- **Successful Intervention:** Scientific vegetable production with NRM techniques Rice-fallow pulse production with chick pea, lathyrus, linseed and Biofortified rice cultivation with Zinco MS and DRR Dhan 45.
- **Significant Yield increase:** Due to introduction of many promising intervention the yield of Chickpea, Linseed, Tomato, Cucumber, Bottle guard, and Bitter guard has been increased 18, 21, 128, 83.8, 84.6 and 45.5 percent than compared to farmer practices in Rabi. In other hand, Paddy (DRR Dhan - 42), and Pigeon pea (Rajeev Lochan) yield also increased by 20 and 36.65 percent respectively.
- As a tangible product, Biotech-KISAN **Tricho Card** produced at main hub.
- Total **1486 cc** (worth of 1.48 lakh) of native *Trichogramma spp.*, (*Trichogramma japonicum* and *Trichogramma chilonis*) has been produced and distributed to farmers under DBT Biotech KISAN project. About **297.76 ha** of crops covered during Rabi/Kharif under this initiative and 740 farm families benefitted.
- Total **9 units of Low-cost shade net house** established at Farmer's field to produce cucumber and tomato.
- The sum of total **Rs. 56.17 lakhs/-** of additional income generated (Rs. 37,420 / Farm Family).
- **Three FPGs and One FIG** (Vegetable, Goat and Biopesticides) formed.
- Demonstrated the scientific goat farming with **Barbari and Sirohi** breeds.
- As a capacity building programme initiatives, total **106 trainings, 69 demonstrations, 74 farmer-scientist** Interface etc organized. As a total, **10,988 farmers benefitted** under various capacity building initiatives. Further, GEO-TAGGING photographs uploaded in the Biotech-KISAN portal (<https://icarbiotechkisanhub.in/>).
- Total **60 farmers** benefitted under Farmers Fellowship programme from three Aspirational Districts namely Korba, Mahasamund and Rajnangaon.
- **Eco-friendly technologies:** Biofertilizer such as *Azospirillum* and Phosphate Solubilizing Biofertilizers (PSB), bioagents *Trichoderma*, *Pseudomonas*



fluorescens and *Trichogramma*; Biopesticides *Bacillus thuringnesis*, *Metarhizium anisoplae*, *Baveria bassiana* are popularised for mass adoption.

- **Improved varieties introduced:** Nutri-rich biofortified rice variety (Zinco rice MS & DRR Dhan - 42, 53 and 45), Indira aerobic -1 for drought tolerant, Rajeswari (IGKV R-1), Indira Maheshwari, MTU -1010 for Insect-pest and diseases resistant. In addition, Chickpea (RVG 201 & 202), Linseed (Deepika), Tomato (Arka Rakshak - IIHR), Drum stick (PKM – 1, TNAU), Cucumber (Krish - VNR), Bottle guard (Kashi Kirti - IIVR), Bitter guard (Racer - BASF) and Ivy guard (Indira Kundru - 35) varieties also promoted.
- **Model quail farming unit** established at KVK, Mahasamund under Tinkering laboratory to promote quail farming in the aspirational districts of Chhattisgarh.
- As a success story, farmer Mr. Lakhan Lal Kolyare generated additional income of **Rs. 4,60,000** from 2.5 hectare of integrated farming unit established under Biotech-KISAN project.
- Total **16 (11 Men and 5 Women)** biotech-Kisan fellows trained to become master-trainers to help the fellow farmers to adopt productive technological interventions.
- About **57 migrant farmers** returned to villages during COVID-19 pandemic and benefitted under these initiatives.

Summary

Major Achievements (2020-22)

| | | | |
|---|--|--|--|
| Aspirational District covered 03 | Village covered 15 | Farm families covered 150 | Technology introduced 29 |
| Crop varieties introduced 18 | Area Covered under Horticulture 20 ha | Animal Breeds Introduced 03 | Capacity building programmes 374 |
| Farmer Interest Groups (FIGs) 04 | Area covered under Rice fallow pulses 100 ha | Bio-fortified rice varieties introduced 02 | Azadi ka Amrit Mahotsav Organised 20 |
| Model quail farming unit established 01 | Low-cost Shade Net and Poly House 09 | Alternative crops introduced 08 | Tribal farm families covered 49 |



Capacity Building Programmes organised:

| Year | Sl. No. | Events | Total | No. of villages covered | No. of beneficiaries |
|---------|---------|---|--------------|-------------------------|----------------------|
| 2020-21 | 1. | Farmers training | 27 | 15 | 894 |
| | 2. | Demonstration | 31 | 15 | 325 |
| | 3. | Field day | 21 | 15 | 568 |
| | 4. | Online Training | 02 | 05 | 40 |
| | 5. | Farmers Scientist interface/ Group Discussion | 32 | 10 | 832 |
| | 6. | Field day programme | 21 | 15 | 568 |
| | 7. | Awareness Programme | 05 | 06 | 270 |
| | 8. | Farmers Exposure Visit Cum Educational Tour | 04 | 15 | 152 |
| | 9. | Farm implements distributed | 291 | 15 | 291 |
| 2021-22 | 1. | Farmers training | 79 | 15 | 3189 |
| | 2. | Demonstration | 38 | 15 | 875 |
| | 3. | Field day | 10 | 10 | 404 |
| | 4. | Online Training | 09 | 30 | 200 |
| | 5. | Farmers Meetings/ Group Discussion | 27 | 15 | 894 |
| | 6. | Field day programme | 10 | 10 | 404 |
| | 7. | <i>Azadi ka Amrit Mahotsav</i> | 20 | 10 | 573 |
| | 8. | Awareness Programme | 11 | 9 | 240 |
| | 9. | Farmers Scientist Interface | 42 | 10 | 832 |
| | | | Total | 680 | - |

Farm implements support provided to farmers:

| Sl. No. | Inputs details | Quantity provided to KVK by main hub | | | |
|---------|---|--------------------------------------|-------------|------------|------------|
| | | Mahasamund | Rajnandgaon | Korba | Total |
| 1. | Seed Treating Drum | 15 | 20 | 15 | 50 |
| 2. | Low Lift Hand Pump | 05 | 05 | 05 | 15 |
| 3. | Paddy Drum Seeder (4 Row Manually Operated) | 15 | 9 | 17 | 41 |
| 4. | IGKV Seed Storage Bin (100kg) | 22 | 62 | 62 | 146 |
| 5. | SRI Marker | 10 | 10 | 10 | 30 |
| | Total | 67 | 106 | 109 | 282 |



Initiatives under *Azadi Ka Amrit Mahotsav*' India@75 celebrations:

1. *Azadi Ka Amrit Mahotsav* was celebrated from 06 to 10 December 2021 at KVK-Mahasamund in collaboration with main hub. The theme of programme are **“Demonstration of low-cost protected cultivation of vegetables such as coloured capsicum, cucumber and tomato”**. In this programme more than 301 farmers were participated (No. of women farmers 84). The programme was conducted in four different villages and Krishi Vigyan Kendra, Mahasamund in offline mode. Five low-cost poly houses (75m² x 5) was demonstrated to farmers for protected cultivation. More than 20 topics were delivered by the experts in the said programme. In addition, the model quail farming unit established under tinkering laboratory was also inaugurated by Dr. P. K. Ghosh, Founder Director and Vice Chancellor, ICAR- NIBSM, Baronda, Raipur, Chhattisgarh along with Dr. P. Mooventhan, PI and Hub Facilitator during the event.
2. *Azadi Ka Amrit Mahotsav* on **“Demonstration of scientific goat farming with the introduction of Sirohi, Jamnapari, Black bengal and Barbari breeds”** was celebrated from 16 to 20 February 2022 on Korba district. More than 272 farmers were participated from five selected villages.

Glimpses of *Azadi Ka Amrit Mahotsav*:



Inauguration of Quail Farming Unit by Dr. P. K. Ghosh, Director & Founder VC, ICAR- NIBSM, Raipur



Demonstration of low-cost protected cultivation of vegetables



Releasing of farm bulletin by dignitaries



Demonstration of scientific goat farming on Korba



Distribution of farm bulletin on scientific goat farming

On-the-Spot Assessment of Project Progress by Mentor, Dr. M. J. Chandre Gowda:

| Sl. No. | Sub-Hubs (KVKs)/ Aspirational Districts visited | Date | Interventions reviewed by the Mentor |
|---------|---|----------|---|
| 1. | KVK-Rajnandgaon | 07.03.22 | <ul style="list-style-type: none"> • Vegetable cultivation with drip and mulching • Goat farming units • Kadaknath farming units |
| 2. | KVK-Mahasamund | 08.03.22 | <ul style="list-style-type: none"> • Low-cost shade net houses • Quail farming units at farmer's field • Rice fallow pulse |
| 3. | KVK-Korba | 09.03.22 | <ul style="list-style-type: none"> • Rice fallow pulse • Goat farming units at farmer's field |

Glimpses of DBT Mentor visit:



Mentor, visited Aspirational district Rajnandgaon on 07.03.2022



Mentor, visited KVK Mahasamund and project site on 08.03.2022



Mentor, visit at KVK Korba, Aspirational district on 09 & 10.03.2022

Problems faced by local farmers in Aspirational Districts and solutions through provided under Biotech-KISAN Hub:

| Activities | Aspirational districts | Problems faced by farmers (before project) | Solution provided by Biotech-KISAN Hub |
|------------|--------------------------------|---|---|
| 1. | Rajnandgaon, Mahasamund, Korba | Malnutrition in identified villages | Introduced and demonstrated biofortified, nutria-rich rice varieties for nutritional security. |
| 2. | Rajnandgaon, Mahasamund, Korba | Monocropping | Rice fallow pulses and oilseed crops such as Lathyrus (Prateek), chickpea (RVG-201,2) and linseed (Deepika) introduced and demonstrated |
| 3. | Rajnandgaon, Mahasamund, Korba | Low productivity of pulses | Demonstrated high yielding variety of pulses Lathyrus (Prateek), chickpea (RVG-201,2) with scientific package & practices |
| 4. | Rajnandgaon, Mahasamund | Low-productivity of horticultural crops | Demonstrated scientific vegetables cultivation under low-cost shade net house with drip irrigation and poly mulching |
| 5. | Rajnandgaon, Mahasamund, Korba | High infestation of insect-pest and diseases | Introduced insect and disease resistant varieties (Tomato (Arka Rakshak, Arka Samrat), Rice (Indira Aerobic, MTU – 1010, Maheshwari), Linseed (Deepika)), demonstrated IPM, IDM, pheromone and light trap |
| 6. | Rajnandgaon, Mahasamund | Bacterial wilt in solanaceous crops | Introduced resistant variety (Tomato – Arka Rakshak) and demonstrated seed treatment and drenching |
| 7. | Rajnandgaon, Mahasamund, Korba | Low technical know – how and traditional package of practices | Organized capacity building programmes, skilled trainings and demonstration of scientific package of practices |

| | | | |
|-----|--------------------------------------|--|--|
| 8. | Rajnandgaon, Mahasamund, Korba | Low level adoption of high yielding varieties | Result demonstration on improved variety of Pulses, Oilseed and Vegetable crops |
| 9. | Rajnandgaon, Mahasamund, Korba | Lack of knowledge in plant protection measures/ technical know-how | Demonstrated Integrated disease, pest and weed management practices |
| 10. | Rajnandgaon, Mahasamund, Korba | Shortage of valid and timely information | Provided need-based information through DBT Biotech KISAN Portal, phone call and WhatsApp groups. |
| 11. | Rajnandgaon, Mahasamund, Korba | Lack of mechanization | Provided need-based farm implements such as - Seed drill, SRI marker, Paddy drum seeder and Seed treating drum |
| 12. | Rajnandgaon, Mahasamund, Korba | Non-availability of quality seeds/ planting materials | Provide quality seeds and planting materials from IIHR, IGKV, Beej Nigam and KVKs |
| 13. | Rajnandgaon, Korba | Lack of alternative livelihood option | Introduced Goat (Sirohi), Kadaknath and Quail farming and demonstrated scientific farming practices. |
| 14. | Rajnandgaon, Mahasamund, Korba | Lack of eco-friendly pest management technology | Introduced and demonstrated trichocard, pheromone trap, and other biocontrol agents |

Major agricultural issues identified before project implementation:

- Mono-cropping (Rice).
- Subsistence nature of farming.
- Low production and productivity.
- Shortage of valid and timely farming information.
- Low level adoption of high yielding varieties.
- Lack of marketing network.
- Lack of knowledge in plant protection measures, natural resource managements & technical know-how.
- Lack of alternative livelihood options and seasonal migration.
- Lack of modern management strategies and technologies.
- Inability to do higher investment.
- Lack of training, demonstration and other capacity building & awareness programmes.
- Lack of drudgery reduction implements.

Farmer's feedback/reaction:

1. Timely provided input materials such as seed, planting material, fertilizer etc.
2. Training and demonstration should be organised to increase the knowledge and Skill in regular interval.
3. Farm Mechanization should be improved.
4. Exposure and educational visit should be conducted.
5. Weather forecasting should be provided at block level for accurate prediction.
6. Lack of wholesale market, that's why vegetables have to be sold by taking them to a distant market which decreases the net profit.
7. DBT Biotech-KISAN project help us in increasing our farm yield, Knowledge & Skill, farm mechanization etc which ultimately improves our living standard.



Glimpses of biotech KISAN hub:



Exposure visit cum educational visit, IGKV, Raipur



Field day programme, KVK Mahasamund



Seed treatment by *Pseudomonas fluorescens*, KVK Mahasamund



Training on Chickpea, KVK korba



Demonstration on drip irrigation and mulching, KVK Rajnandgaon



Goat rearing, KVK Rajnandgaon

Glimpses of Farmers Training:



Farmers Scientist meet with tribal farmers



Farmers training on Quail farming



Seedling treatment by Bio fertilizer (Azospirillum, Phosphate Solubilizing Bacteria & Trichoderma)



Preparation of capsicum nursery in protray



Seed Treatment by Pseudomonas Fluorescens



Farmers Scientist Connect Meet

Glimpses of Demonstrations:



Training cum demonstration on spraying of insecticides by drone



Training cum demonstration on foldscope microscope



Demonstration on low-cost protected cultivation of vegetable crops



Demonstration on Line transplanting on Paddy at farmer field



Demonstration on scientific goat rearing (Sirohi breed)



Demonstration on scientific nursery raising

Glimpses of Field Day celebration



Field Day Celebration by KVK, Mahasamund



Field day programme at Achhola



Field Day Celebration by KVK, Korba



Cultivation of capsicum in Low cost shednet house



Demonstration of Trichocard

Project Parameters and Activities implemented at field level

| Parameters | Activities |
|--|--|
| Number of demonstrations carried out at farmers' field with their details of GEO-TAGGING | 38 demonstrations conducted and GEO-TAGGING photographs uploaded in the portal |
| Number of trainings organised till date along with number of farmers attended/ benefitted | 89 offline and 09 online trainings. More than, 3189 farmers benefitted |
| Linkages developed with R&D Institutions/ State Agricultural Universities and KVKs | IGKV, KVKs – Mahasamund, Rajnandgaon and Korba. Swami Vivekanand College of Agricultural Engineering and Technology (SVCAET), Beej Nigam, NSC, CARS-Mahasamund, Rajnandgaon and Korba, State Dept. of Horti. Agri. and Veterinary. |
| Number of Interface organized between farmers and scientists | Total 42 Interface organized |
| Immersion of scientists in agricultural farms: No. of visits by the scientists to the farmers' field | Total 156 visits by scientist |
| Number of SHG formed and financial assistance obtained from NABARD | Three FPGs and One FIG (Vegetable, Goat and Biopesticides) formed. Nil (In process) |
| Number of local farm leaders (men and women) promoted to facilitate transfer of knowledge and technology | Total 16 farmers (11/05) |
| Number of Biotech-KISAN fellowship provided to men and women farmers for becoming Master Trainers | <ul style="list-style-type: none"> Fellowship provided to 60 farmers (2020-21) - (M - 40 & F - 20) Fellowship under process for 60 farmers (2021-22) - (M - 45 & F - 15) |

Small Scale Biocontrol Production Unit at Main Hub

Supply of native *Trichogramma spp.*, to farmers under DBT Biotech KISAN project

| <i>Trichogramma japonicum</i> (cc) | <i>Trichogramma chilonis</i> (cc) | Total area (Kharif and Rabi) | Farmer benefitted | Rs. (L) |
|------------------------------------|-----------------------------------|------------------------------|-------------------|---------|
| 824 | 662 | 297.76 | 740 | 1.48 |

DBT Biotech-KISAN Hub – At a glance

| S. No. | Activities | Nos. | Details |
|--------|-------------------------------------|------|--|
| 1. | Training programme organised | 98 | Total 3189 farmers benefitted from three districts viz., Korba, Rajnandgaon and Mahasamund, of Chhattisgarh. Technologies such as rice, pulses, vegetable and livestock production are disseminated. |
| 2. | Demonstration conducted | 38 | Total 875 farmers benefitted from fifteen villages of Chhattisgarh. Recommended practice of biotic stress management, scientific production technologies of major crops and livestock. |
| 3. | Technology Popularized | 29 | Technologies such as biocontrol agents, bio-fertilizers, bio-fortified varieties, pest and disease resistance varieties, Happy Seeder, Aqua Ferti seed drill, drip and poly mulching, low-cost protected cultivation, improved breeds of goat etc., are popularised. |
| 4. | Wide spread and adoption of variety | 18 | Rice – (Indira Maheshwari, Rajeswari (IGKV R-1), Indira Aerobic, Zinco rice MS, Protegin, DRR Dhan-42, MTU-1010), Lathyrus (Prateek and |

| | | | |
|----|---|----|--|
| | | | Mahateoda), Chickpea (RVG- 201), and Pigeon pea (Rajiv lochan), Tomato (Arka rakshak and Arka samrath), Moringa (PKM-1), Onion (Pune fursungi) bitter gourd, IVY Gourd, cucumber etc. has been wide spread and adopted in three districts namely Korba, Rajnandgaon and Mahasamund, covered 60 hectares. In total, 150 farmers are adopted above varieties and benefitted. |
| 5. | Farmer Producer Group (FPGs) and Farmer Interest Group (FIGs) | 04 | a. Scientific vegetable production - Horticulture module. b. Scientific goat raring - Livestock module. c. Biofortified Rice Production – Crop based module. d. Natural Bio Pesticides group – NRM Based module. |
| 6. | Women farmers empowered | 7 | Women farmers empowered through capacity building programmes and technological adoption under four modules viz., Crop, Livestock, NRM and Horticulture. |
| 7. | Youth trained and involved in farming | 82 | Youth farmers has been trained in diagnosis of plant diseases through, goat rearing, scientific crop production and Hi-tech horticulture. |
| 8. | SC farmers benefited | 08 | Involved under Crop, Livestock, NRM, Horticulture, and crop disease diagnosis. |
| 9. | ST farmers benefited | 49 | Benefitted under Crop, Livestock, NRM, Horticulture, crop disease diagnosis. |

| | | | |
|-----|---|-----|---|
| 10. | Spread adoption of variety/ planting materials/tools/ machinery | 15 | Please refer SI.No. 3 & 4 |
| 11. | Monitoring and coordinating demonstrations and field trails | 38 | Coordinated through three KVKs namely Korba, Rajnandgaon and Mahasamund in Bio-fortified rice production, pulses and vegetable production. |
| 12. | Adoption of technology and package of practices by farmers | 150 | Recommended technologies under Crop, Livestock, NRM, Horticulture and crop disease diagnosis. |
| 13. | Technology evaluated | 14 | Goat framing, rice cultivation, rice fallow pulses with lathyrus, chick pea and lentil, quail farming, Zinco rice MS and DRR Dhan – 42. |
| 14. | Farmers' Feedback documented and reported | 62 | On various adoption related issues in recommended agricultural intervention. |
| 15. | Success stories documented | 16 | Documented on various successful intervention and submitted to DBT. |
| 16. | Service provided related to production, processing and distribution of seed and planting materials | 05 | Seed provided to farmers for production and farmers to farmer sharing in rice, chick pea, lathyrus, pigeon pea and linseed. |
| 17. | Front line demonstration organized | 12 | Line sowing of lathyrus, chick pea, paddy and Zinco MS, onion production, seed treatments with bioagents and bio fertilisers, paddy drum seeder, happy seeder and low-cost shade net house. |
| 18. | Inter institutional HRD programmes organized/coordinated. | 09 | Organised in collaboration with IGKV-KVKs, College of Agriculture and Research Stations State department of agriculture, horticulture, animal husbandry. Two five days HRD programme organised at KVKs |

| | | | |
|-----|--|-----------------|---|
| | | | Mahasamund and Rajnandgaon during 6-10 December 2021 as a part of <i>Azadi ka Amrit Mahotsav</i> |
| 19. | Activity organized related to e-extension services, mobile advisory system and ICT tools | 07 | Online Farmer's scientist interface, Awareness programme on the safe operation of agricultural activities during the COVID-19 pandemic. Created WhatsApp groups, and portal (DBT Biotech-KISAN) to disseminate need based information. m-Kisan portal, IGKV crop doctor expert system, Damini, Meghdoot app also used to deliver the farm information to the farmers. |
| 20. | Field day organized | 10 | Organised on Scientific rice, chick pea and lathyrus cultivation |
| 21. | Research- Extension – Farmers – Interface meeting organized | 30 | Organised to address various field level issues and other agriculture related information shared through virtual as well as physical interface meetings. |
| 22. | Publications (Folder, Bulletin, Popular Articles etc.) with complete authors and other details | 14 | Fourteen extension folders and bulletin published to provide technical and scientific information to farmers. Under DBT – Biotech KISAN Hub |
| 23. | Total additional income generated. | Rs. 37.38 lakhs | Project, Rs. 24920/- additional income generated per farm families. |

Publications and social media under DBT Biotech- KISAN Project:

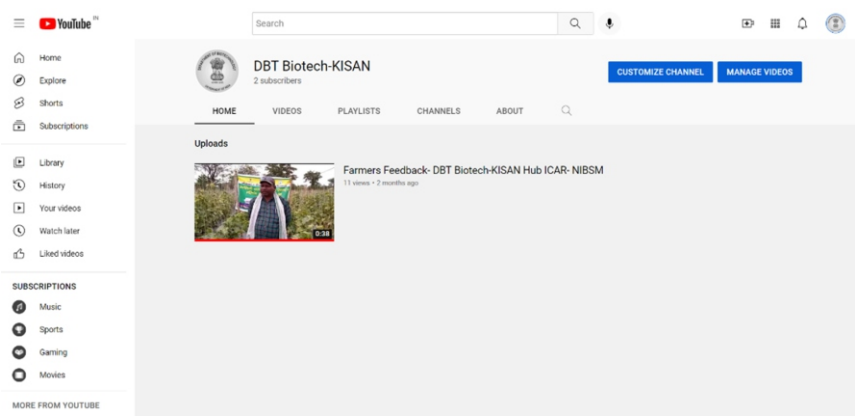
| S. No. | Title |
|-------------------------|---|
| Popular Articles | |
| 1. | बटेर पालन एक लाभकारी व्यवसाय (Quail farming a profitable business) Author- Dr. P. Mooventhan, Dr. Rewendra Kumar Sahu, Manoj Kumar Sahu and Praveen Banvashi (Article- Ropan, Volume- 12, Issue -August 2021, Page no.- 15 &16) |
| 2. | बकरी पालन एक उत्तम व्यवसाय (Goat Farming: A remunerative business) Author- Dr. P. Mooventhan, Dr. Rewendra Kumar Sahu and Dilip Kumar Patle (Article- Krishi World, Volume- 50, Issue -September 2021, Page no.- 35 & 36) |
| 3. | टमाटर में कीट- रोग की रोकथाम (Insect- disease prevention in tomato) Author- Dr. P. Mooventhan and Dr. Rewendra Kumar Sahu (Article- Krishi Jagat, Volume- 50, Issue -August 2021, Page no.- 09) |
| 4. | छत्तीसगढ़ में अगेती फूलगोभी की वैज्ञानिक खेती (Scientific cultivation of early cauliflower in Chhattisgarh) Author- Dr. P. Mooventhan, Dr. Rewendra Kumar Sahu, Praveen Banwashi and Toran Nisad (Article- Ropan, Volume- 04, Issue -December 2021, Page no.- 17 &18) |
| 5. | चने की उन्नत खेती एवं उत्पादन तकनीक (Improved cultivation and production technology of Chickpea) Author- Dr. P. Mooventhan, Dr. Rewendra Kumar Sahu, and Manoj Kumar Sahu (Article- Ropan, Volume- 04, Issue -December 2021, Page no.- 23 &24) |
| Folders | |
| 6. | बटेर पालन तकनीक (Quail farming techniques) Author- P. Mooventhan, Rewendra Kumar Sahu, Uttam Singh, Manoj Kumar Sahu and Praveen Banvashi (ICAR- NIBSM, NIBSM/EF/2021-56) |
| 7. | बकरी पालन : एक लाभकारी व्यवसाय (Goat Farming: A profitable business) Author- P. Mooventhan, Rewendra Kumar Sahu, B. S. Rajput, Gunjan Jha, Uttam Singh, Manoj Kumar and Dilip Patle (ICAR- NIBSM, NIBSM/EF/2021-55) |



| Technical bulletin | |
|--------------------|---|
| 8. | <p>सहजन की उन्नत काश्त (Advanced cultivation of drumstick) Author- Gunjan Jha and B. S. Rajput बायोटेक किसान हब, कृषि विज्ञान केन्द्र, राजनांदगांव, Biotech KISAN hub bulletin-2021/3</p> |
| 9. | <p>बकरी पालन एक लाभकारी व्यवसाय बुलेटिन बायोटेक किसान हब, कृषि विज्ञान केन्द्र, राजनांदगांव, Biotech KISAN hub bulletin-2021/3 Author- Gunjan Jha and B. S. Rajput बायोटेक किसान हब, कृषि विज्ञान केन्द्र, राजनांदगांव, Biotech KISAN hub bulletin-2021/2</p> |
| 10. | <p>उद्यानिकी फसलों में लाभकारी: टपक सिंचाई प्रणाली (Beneficial in Horticulture Crops: Drip Irrigation System) Author- Saket Dubey, S. K. Verma, Kamal kant Lodhi and Satyendra Gupta कृषि विज्ञान केन्द्र, भलेसर, महासमुन्द्र/प्रकाशन/तकनीकी बुलेटीन/2022/01</p> |

Portal & Social Media

| | | |
|-----|----------------|--|
| 01. | Project portal |  <p>https://icarbiotechkisanhub.in/</p> |
|-----|----------------|--|

| | | |
|-----|-----------------|--|
| 02. | YouTube channel |  |
|-----|-----------------|--|



VIII. Policy formulation based on field visit and practical assessment

| Sl. No. | Problem identified | Method of assessment | Solution/advisory provided |
|---------|--|--|--|
| 1. | Severe incidence of sugarcane leafhopper, <i>Pyrilla purpusilla</i> on wheat | Survey and sampling | Spraying of any systemic insecticide Spraying of quinolphos |
| 2. | Increasing incidence of pink stem borer in wheat | White ear count | Spraying of either Orthosilicic acid (@ 2 ml/l) or soil application of diatomaceous earth @ 150 kg/ha |
| 3. | Rodents in paddy, chickpea and wheat | Live burrow count | Baiting with Bromodiolone (96:2:2) |
| 4. | High incidence of disease and pest in rice crop due to use of poor quality/ lack of quality seed | Visit to villages discussion with farmers | To change the rice variety and use of certified seeds of rice along with proper seed treatments measures |
| 5. | Utilisation of vacant area/ badi | Visit to village and discussion with farm families | Suggested to use unoccupied area for kitchen gardening and growing fruit and medicinal plant for home purpose. |
| 6. | Issues of water shortage during summer/ retention or storage of water | Group meeting with farmers | Advised to store rain water for home and creation of ponds for storage of water for farming purpose. |
| 7. | Sheath blight of rice | Field visits and survey | Deep ploughing in summer; Optimum plant population providing wider spacing as close planting/dense canopy predisposes the disease; Use seed treatment; apply balanced fertilizer as high level of N ₂ fertilizer increases the severity |



| | | | |
|----|--|--|--|
| | | | <p>Stop irrigation water flowing from infected fields to healthy fields.</p> <p>Control of sheath blight is mainly achieved with the use of fungicides such as Hexaconazole, validamycin etc.</p> |
| 8. | Wilt / root rot complex in <i>rabi</i> pulses | Interaction with the farmers | <p>Deep summer ploughing and crop rotation with cereals/ mustard.</p> <p>Apply organic manure during field preparation</p> <p>Uproot and destroy infected plants; avoid water logging;</p> <p>Seed treatment with <i>Trichoderma. viride</i> @4g/kg seed or Carbendazim or Thiram 2g/kg of seed or their combination.</p> |
| 9. | Poor wheat crop stands and growth | Field visits | <p>Recommended to undertake proper agronomic interventions including line sowing, use of balanced fertilizers.</p> |
| 10 | Fall armyworm, <i>Spodoptera frugiperda</i> (60-70% infestation) | Estimated by number of damaged plants/ number of plants observed | <ul style="list-style-type: none"> • Seed treatment with Cyantraniliprole 19.8% + Thiamethoxam 19.8% FS @ 6 ml/kg of seed will be effective for 15-20 days • Erect bird perch @ 25-50 numbers/ha to attract predatory birds during early stage of the crop (up to 30 days) on feeding various larval stages of FAW |



| | | | |
|-----|--|-------------------------------------|---|
| | | | <ul style="list-style-type: none"> • First Window (seedling to early whorl stage): To control FAW larvae at 5% damage to reduce hatchability of freshly laid eggs, spray 5% NSKE / Azadirachtin 1500ppm @ 5ml/l of water |
| 11. | Bhendi - >40 % powdery mildew infestation in Dhansoli and Bangoli | Estimated damage by visual counting | Spray inorganic sulphur 0.25% or Dinocap 0.1% 3 or 4 times at 15 days interval for managing PM of Bhendi. |
| 12. | Brinjal fruit and shoot borer, <i>Leucinodes arbonalis</i> and Whitefly, <i>Bemisia tabaci</i> | Survey and sampling | Management approaches were not advised as pest incidence was very low. |
| 13. | Fruit borer incidence was very low. Whitefly incidence was moderate (11/plant) | Estimated % incidence by counting | Management approaches were not advised as pest incidence was very low. |



सत्यमेव जयते

GOVERNMENT OF INDIA



भाकृ'भनुष
ICAR



रा जै स्ट्रे प्र सं
NIBSM

ICAR

NATIONAL INSTITUTE OF
BIOTIC STRESS
MANAGEMENT

Rendering solution to biotic stresses