Dated: 15.02.2015

Sub:- Project on Enhancing Grass pea production for safe human food, animal feed and sustainable rice-based production systems in India funded under NFSM-Monitoring Report regarding.

Ref.: F. No. CPS 5-8/2013-NFSM dated 30th January 2015.

The major Lathyrus cultivating states in India are Chhattisgarh, Bihar, Jharkhand, Maharashtra, Odisha, Assam, West Bengal and Eastern Uttar Pradesh. In the Rice-Based Cropping system, utilizing the available moisture, it is grown as a relay crop and it's a better option to earn income from rice fields. It is also taken as mixed crop and intercrop during rabi and sole crop under "Utera" conditions.

Grasspea contains 34% protein and other essential micro-nutrients and may provide nutritional security to the low income people in the society. However the seeds contain Beta-*ODAP (*β-N-oxalyl-L-α, β-diaminopropionic acid), a toxin known to cause neuro-lathyrism, if consumed as staple food for as long period of 4 to 5 months continuation. In view of this, a ban on the sale of its produce was imposed in some states but its cultivation was not under ban.

Lathyrus under Development Programmes

The promotion of this crop and its cultivation has not been covered under the NFSM-Pulses, A3P and 60000 Pulse Village Programme. However, the DAC-ICARDA collaborative project was funded during the 11th Plan (last two years 2010-11 to 2011-12) with an out lay of Rs. 362.03 lakh. The pilot states in the first Phase were U.P (Jhansi, Lalitpur, hamirpur, Mirzapur, Chandauli); Chhattisgarh (Raipur, Durg, Bilaspur), Bihar (Patna, Nalanda) and West Bengal (Coochbehar/Nadia). Initially for two years (2010-11 to 2011-12), the project continued during 2012-13.

The other cooperating centres are Indian Grassland and Fodder Research Institute, Jhansi, IIPR, Kanpur, IGKV, Raipur, Society for Promotion of Agricultural Research & Knowledge (SPARK), Patna (Bihar), Uttar Banga Krishi Viswavidyalaya, Cooch Behar (West Bengal) Bidhan Chandra Krishi Vishwavidyalaya, Kalyani (West Bengal) and Pulses & Oilseeds Research Station Berhampore, Murshidabad (West Bengal).

The Objectives and work Plan of the project under **phase I** were as fallows

Objectives:

i. Enhancing fodder and straw yields through introduction of high-biomass and low toxin grass pea varieties to support nutritional feed & fodder where only paddy straw is available as cattle feed.
ii. Replacement of indigenous high toxin grass pea varieties available with farmers with low toxin & high biomass varieties through farmers participatory approach.
iii. Identification of new grass pea varieties through adaptive research, multi-locational testing by farmers participatory selection.
iv. Developing strong seed production and distribution system of quality dual purpose seeds of farmers- preferred varieties along with matching production technologies.
v. Capacity building of farmers, extension personnel etc. for farmer-participatory adaptive research and technology transfer for adoption and expansion of improved production technologies, quality seed production through training, visits, workshops and seminars etc.
vi. Back-up research (farmers participatory) for further identification of grass pea varieties and refinement of production technologies.

Year-wise work plan

Year	Work Plan
1st year	i. Project launching workshop for partners and stakeholders (State Universities, National Seed Corporation, National Crop Coordinator, NGOs, Local Governments, ICARDA) to develop work-plans for the entire period of project. ii. Bench mark survey through PRA and selection of 10-15 farmers/farmers group in intensive grass pea- growing areas in the selected districts/villages of states involved in the project. iii. Supply of inputs and verification and demonstration of low-ODAP varieties (Nirmal, Prateek, Ratan, P-24, Mahateor) and improved technology (seed rate, time of planting, priming and weeding schedules etc.) will be conducted in farmers fields. This will lead to select farmer-preferred varieties, which will enable faster technology dissemination, adoption and farmer to farmer seed diffusion. iv. IGFRI, Jhansi will evaluate grass pea lines for high biomass and quality for fodder and feed and value addition. v. To develop new varieties, a farmer-participatory varietal selection approach (PVS) will be followed. All available low-toxin lines will be planted in farmers' fields at several sites in each state. Individual farmers, groups of farmers, extensionist, NGO staff and the breeders will participate in selection of promising lines for eventual release. ODAP analysis will be carried out at

	IGKVV and at ICARDA before release of variety. vi. ICARDA and IGKV will develop and supply ne low-ODAP lines with higher grains and fodder yields to test in various agro-ecologies of project areas. vii. Women/House wives will be specially trained on removal of toxic compounds before consumption by various methods. This information will also be broadcasted by mass media, poster, leaflets etc. viii. Travelling workshops, field days, training research, extension and NGO staff will be conducted as a part of human resources development. Besides, farmers will be empowered through post and pre-harvest training through Farmers field school, On farm farmers fair, Workshops, Training. ix. Arranging visits of Scientists & research/development mangers to Syria and India (as the case may be) for field evaluation and selection of lines suitable to Indian conditions for incorporation in project areas and beyond. Annual workshop.
2nd Year	i. Selection of 2-3 villages in each selected districts with retention of 50% earlier selected farmers. ii. Bench mark survey through PRA and selection of 10-15 farmers/farmer's group in intensive grasspea-growing areas in selected districts/villages of states involved in the project. iii. Supply of inputs and verification and demonstration of low-ODAP varieties (Nirmal, Prateek, Ratan, P-24, Mahateora) and improved technology (seed rate, time of planting, priming and weeding schedules etc.) will be conducted in farmers fields. This will lead to select farmer-preferred varieties, which will enable faster technology dissemination, adoption and farmer to farmer seed diffusion. iv. IGFRI, Jhansi will evaluate grass pea lines for high biomass and quality for fodder and feed and value addition. v. ICARDA and IGKV will develop and supply ne low-ODAP lines with higher grains and fodder yields to test in various agro-ecologies of project areas, importing from Ethiopia, Bangladesh and Syria, if need be. vi. Quality/Certified seed production of improved varieties will preliminary be carried out by public organization. In addition to that, seed production will be carried out through contract farmers and NGOs, if necessary. vii. To develop new varieties, a farmer-participatory varietal selection approach (PVS) will be followed. All available low-toxin lines will be planted in farmers fields at several sites in each state. Individual farmers, groups of farmers, extensionist, NGO staff and the breeders will participate in selection of promising lines for eventual release. ODAP analysis will be carried out at IGKVV and at ICARDA before release of variety. viii. Travelling workshops, field days, training research, extension and NGO staff will be conducted as a part of human resources development. Besides, farmers will be empowered through post and pre-harvest training through Farmers field school, On farm farmers fair, Workshops, Training. ix. Women/House wives will be specially trained on removal of toxic compounds

	before consumption by various methods. This information will also be broadcasted by mass media, poster, leaflets etc. x. Arranging visits of Scientists & research/development mangers to Syria and India (as the case may be) for field evaluation and selection of lines suitable to Indian conditions for incorporation in project areas and beyond. xi. Annual workshop, publication of training materials and midterm evaluation. xii. Seed production of selected varieties by farmers and creation of village seed hub.
3rd Year	i. Selection of 2-3 villages in each selected districts with retention of 25% from 1st year, 50 % from 2nd year selected farmers with interested in seed multiplication and farmers participatory research. ii. Bench mark survey through PRA and selection of 10-15 farmers/farmer's group in intensive grasspea-growing areas in selected districts/villages of states involved in the project. iii. Supply of inputs and verification and demonstration of low-ODAP varieties (Nirmal, Prateek, Ratan, P-24, Mahateora) and improved technology (seed rate, time of planting, priming and weeding schedules etc.) will be conducted in farmers fields. This will lead to select farmer-preferred varieties, which will enable faster technology dissemination, adoption and farmer to farmer seed diffusion. iv. IGFRI, Jhansi will evaluate grass pea lines for high biomass and quality for fodder and feed and value addition. v. ICARDA and IGKV will develop and supply ne low-ODAP lines with higher grains and fodder yields to test in various agro-ecologies of project areas, importing from Ethiopia, Bangladesh and Syria, if need be. vi. To develop new varieties, a farmer-participatory varietal selection approach (PVS) will be followed. All available low-toxin lines will be planted in farmers fields at several sites in each state. Individual farmers, groups of farmers, extensionist, NGO staff and the breeders will participate in selection of promising lines for eventual release. ODAP analysis will be carried out at IGKVV and at ICARDA before release of variety. vii. Quality/Certified seed production of improved varieties will preliminary be carried out by public organization. In addition to that, seed production will be carried out through contract farmers and NGOs, if necessary. viii. Travelling workshops, field days, training research, extension and NGO staff will be conducted as a part of human resources development. Besides, farmers will be empowered through post and pre-harvest training through Farmers field school, On farm farmers fair, Workshops, Training. ix. Women/House wives will be specially trained on removal of toxic compounds before consumption by various methods. This information will also be broadcasted by mass media, poster, leaflets etc. x. Arranging visits of Scientists & research/development mangers to Syria and India (as the case may be) for field evaluation and selection of lines suitable to Indian conditions for incorporation in project areas and beyond. xi. Travelling seminars for famers and Govt. officials showing the outstanding lentils

	fields in different states and interacting with farmers. xii. Adoption and Impact studies will be conducted at the end of project period. xiii. Annual workshop, publication of training materials and final evaluation of project. xiv. Seed production of selected varieties by farmers and creation of Villages seed hub. xv. Submission of final report and joint publication in referred journal, book chapters, synopsis/workshop proceeding, leaflets, extension message etc.

Phase II (2013-14 to 2015-16)

Vide letter No.CPS 5-8/2013-NFSM, dated 01.10.2013, Project proposal on similar title has been approved afresh with an allocation of Rs. 300.06 lakh for a period of three year (2013-14 to 2015-16). An allocation of Rs. 106.55 lakh was given for 2013-14 and for 2014-15 Rs. 125.25 lakh were provisioned. The Objectives and work Plan of the project under **phase II** were as fallows

Objectives

- Replacement of indigenous high toxin grasspea varieties available with farmers with low toxin and high biomass varieties through farmers' participatory approach.
- Enhancing fodder and straw yields through production of high-biomass and low toxin grasspea varieties to support nutritional feed & fodder where only paddy straw is available as cattle feed.
- Establishing grasspea as a second crop in rice-fallows to break mono-cropping, thus increasing cropping intensity and income.
- Establishment of seed Hubs at village level for sustainable seed chain for varietal replacement in traditional areas.
- Capacity building of farmers and extension personnel in improved production technology, quality seed production, post-harvest processing through trainings, visits, field days, etc.

Year-wise work plan

Year	Work Plan
1st year	i. Project launching workshop for partners and stakeholders (DAC, State Universities, ICAR, National Seed Corporation NGOs, State governments, ICARDA) to develop work-plans for the entire period of the project. ii. Selection of 10 clusters in a district each cluster will comprise of 3-4 villages having 15 ha area for demonstration in a composite manner. Emphasis would be on entire village high toxin indigenous seed replacement with low toxin

	improved varieties grasspea seed. iii. Bench mark survey through PRA and identification of farmers and their fields from each village iv. Supply of inputs (Annexure-A) and demonstrating the technology with few promising location specific varieties for participatory evaluation v. Organizing visits, Field days vi. Capacity building, training in quality seed production, PHT and processing vii. Buy back of seeds from farmers and storage viii. DAC monitoring of project implementation at field level ix. Annual Review and Planning workshop x. Submission of Annual Report (Technical+ Financial) to DAC
2nd to 3rd year	i. The activities as mentioned above for 1st year would be repeated and new villages would be selected every year for demonstration and seed kit distribution. ii. Seed processing, certification, packaging and storage would form a part of training from 2nd year onward. iii. Buy back of seeds from farmers and safe storage iv. DAC monitoring of project implementation at field level v. Annual Review and planning workshop. vi. Submission of Annual Report (Technical+ Financial) to DAC vii. Submission of Final comprehensive Report viii. Conduct of impact analysis and publication of all the reports for final evaluation

Deliverables – (Chhattisgarh)

District	No. of villages	Area (in ha)	No. of farmers/year	Low toxin varieties	Farmers trained/yr.
Durg	160 (10 cluster of 3-4 villages each /yrr)	600 ha (150 ha/yr)	350-400	Mahateora Prateek	450-500
Bilaspur	160 (10 cluster of 3-4 villages each/yr)	600 ha (150 ha/Yr)	350-400	Mahateora Prateek	450-500
Total	320	1200 ha	700-800	2 varieties	900-1000

i. At least 1000 ha high toxin traditional grasspea would be replaced with low toxin improved varieties.
ii. Minimum 4500 farmers would be trained in cultivation of dual purpose grasspea, its post- harvest processing and physical detoxification of indigenous grasspea
iii. Nutritive fodder would be available for animals which would give higher productivity
iv. Tribal farmers would get an additional crop in their rice-fallow (about 200 ha) where nothing was grown.

v. About 13,500 q low toxin and high biomass seed of improved varieties of grasspea would be produced to continue the seed chain at village level
vi. Improvement in the soil health due to the cultivation of this pulse would be an additional benefit for sustainable agriculture

To monitor the project on the above cited subject, undersigned visited Bialspur and Durg districts of Chhattisgarh from 24-25th February, 2015. Dr. Ashutosh Sarker & Dr. Pooja Sah ICARDA, New Delhi, Dr. H. C. Nanda, P.I. Grasspea Project- Durg Centre and NLMT-CG members Dr. R.P. Singh, Principal Scientist, Sehore, Dr. Sanjay Sharma, Principal Scientist, IGKV, Shri G. K. Nirman, JDA Raipur, also accompanied the visit.

OBSERVATIONS/SUGGESTIONS

- DAC-ICARDA collaborative project aims at enhancing high yielding grasspea varieties with low-ODAP content (toxin level) such as Prateek (0.08%), Ratan (0.06%), Mahateora (0.07%) and Nirmal (dual purpose var., 0.15%). Grasspea varieties for safe consumption, higher income to farmers; Higher fodder and forage production; and providing sustainable Rice-Based production system under rainfed conditions.

- Chhatisgarh (Raipur, Durg, Ranjandgaon, Kabirdham, Bilaspur, Dhamtari, Raigarh, Mahasamund, Janjgir-Champa and Jaspur) and its adjoining areas of Vidarbha region of Maharashtra and MP are the major areas of its cultivation and consumption. In Chhattisgarh, its major cultivation is mainly under "Utera" system, where the seeds of grass pea are broadcasted on the standing water in the paddy field about 10-15 days before harvest.

1. **Bilaspur**

The project implementation is by DDA, Bilaspur, Govt. of CG as collaborator. 150 ha area has been reported as covered under cluster demonstrations during the current year.

- In village Hirri, Block-Masturi, Cluster demonstration of Grasspea with Mahateora was visited. Cyclonic rains during 13th-14th October 2014 had delayed harvesting of Kharif Paddy thereafter sowing of Lathyrus as sole crop was done between 5th to 9th December (the appropriate sowing time is 15 October to 15 November). Delayed sowing resulted with poor plant population, the crop was in flowering stage. The sole crop was sown by broadcasting method after ploughing. Even after severe Thrips

damage and infestation above ETL, no plant protection measures were advocated/applied by the Extension officers. Traditionally the farmers are growing Lathyrus under relay cropping in "Utera" conditions by seeding the crop in standing paddy field, thereby harvesting the Lathyrus at an early stage before the day temperature shoots up during summer.

The performance of demonstration was highly un-satisfactory, Admixture of two varieties, severe thrips infestation, poor plant population was noticed. Not a single training/field visit was organized and neither the demonstration sites was visited by the implementing agencies. In no way such demonstration meets the very basic objectives of the project. Here, the district collaborator failed to appraise its state Head Quarter or the Mission Director, NFSM about implementation of the project. To contain Thrips infestation 2% DAP solution + Emidachlor (Confidor) a highly systemic insecticide was recommended by the team.

- In village Risda (Block-Masturi) another demonstration with variety Prateek under relay cropping was seen. Here, the field was not properly leveled, soil testing was not done, staggered plant population due to no germination/poor germination in deeper portion. Otherwise, the remaining crop condition was comparatively better with low infestation of Thrips below ETL.

- Rice-Wheat-Urdbean cropping system has been pre-dominant in the area which is getting a setback for the last three-four years due to stray cattle and non existence of policy mechanism or community movement to ensure complete ban on stray cattle between 1st July to 30th April.

- It is pertinent to mention that the need of Chhattisgarh state is to ensure the availability of quality seeds of low ODAP varieties Prateek, Ratan, Mahateora which are suitable for grains, fodder, green vegetable (sag); popularization of these new varieties, to promote relay cropping of this crop.

- The ICARDA, under the existing project, may be advised to standardize the utera techniques and utera agronomy for major districts of the state with their SAU collaborator.

- The available technologies for yield enhancement under relay cropping of Lathyrus have been generated by the SAU should have been the part of the project which is the real requirement of Chhattisgarh farmers.

- Supplementary sowing of moist seed at the blank portion of field then Spraying of 2% DAP before flowering and need based application of insecticide for Thrips control is recommended by SAU. However, these aspects on low cost technique value addition, crop diversification and seed production programme etc. were not considered in Bilaspur.

2. Durg

In Durg, the project is jointly operational by ICARDA and SAU, Raipur (CG). 03 Blocks namely Patan, Durg and Dhamda involving 25 villages, 76 farmers and 150.5 ha of area have been reported as covered. Two varieties namely (Prateek - 131.44 ha and Mahateora- 19.06 ha) have been organized with the registration for the seed production programme during 2014-15.

The Cluster demonstration of Grasspea (Lathyrus) with variety Prateek under direct seeding as sole crop was visited. Here, the crop was sown on 15th November as sole crop after palewa. A seed rate of 60 kg/ha and planting through seed drill was demonstrated. After germination first irrigation was provided. The plant population and crop condition was very good with the expected grain yield of 12-15 q/ha, 2&1/2 time higher than the traditional system Utera (relay cropping). The technology demonstrated or displayed on Flaxy Board.

The intervention of mechanization and organization of seed production in the demonstration is quite satisfactory. However, the demand of the sizeable percentage of farm holders is the low cost, low input Utera technology for varying agro-eco situations in Raipur, Durg, Mungeli, Blod, Bilaspur etc. The project collaborator therefore should have taken a feedback of the State Agriculture Department of Government of Chhattsigarh.

The team also had a wrap-up meeting with Additional Chief Secretary and Agriculture Production Commissioner, Govt. of Chhattisgarh. In view of near failure of programme implementation/monitoring and lack of interest of the District agriculture functionaries, who are the collaborator, it was suggested to shift the remaining period of project activities from Bilaspur to Mungeli District which has more area under “Utera” cultivation.

The ACS/APC was also of the view that for the for real success and sustainability of the efforts, such the projects should have direct collaboration at the Apex level i.e. Govt. of India + ICARDA + SDA+ SAU + Other stake holders, rather than the district functionaries.

The DAC-ICARDA project in the past had no involvement of the Crop Development Directorates. It may be suggested that, to have updated information on the desired/mandated deliverables/phase-wise progress, the details on National and International projects funded under NFSM should also be endorsed to concerned Crop Directorates.


छत्तीसगढ़ शासन कृषि विभाग
इकार्डा योजनान्तर्गत लाकड़ी फसल पर
"कृषक गोष्ठी"
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