CAPP-7

Format for Application for
Agri-CRP Projects

1. Title of Platform: **Consortium Research Platform (CRP) on Conservation Agricultural (CA)**

2. Title of the Platform Project: **Evaluation of Conservation Agricultural (CA) practices under Rice-fallow system of Eastern Region**

3. Location (Bihar, Jharkhand and Chhattisgarh)
   Instituteôs Name: ICAR Research Complex for Eastern Region
   Place: Patna
   District: Patna
   State: Bihar

4. Principal Investigator (PI)
   Name: Dr. J. S. Mishra
   Designation: Principal Scientist and Head, Division of Crop Research
   Date of Birth: 31-03-1967
   Experience: 25 years
   Number of Scheme handled: 03
   Number of important research publications: 90
   Number of other Research Schemes (being carried out by PI):02
   Title of Scheme (s)
   i. Cereal Systems Initiative for South Asia (CSISA)
   Name of the funding Agency: Bill & Melinda Gates Foundation/CIMMYT
   Period from: January 2013 to September; 2015 Grant: Rs. 33.00 lakhs
   ii. Improved Rice Rainfed-based Agricultural System (IRRAS)
   Name of the funding Agency: IRRI
   Period from April 2012 to September 2015; Grant: Rs. 27.00 Lakhs

5a. Co-Principal Investigator (Co-PI)
   Name: Dr. M. Idris
   Designation: Principal Scientist (Entomology)
   Date of Birth: 01-07-1958
   Experience: 28 Years
   Number of Scheme handled: 03
   Number of important research publications: 40
   Number of other Research Schemes (being carried out by Co-PI)

Title of Scheme (s) Integrated Farming System
Name of the funding Agency: ICAR
Period from 2011 to 2015 Grant: Rs. 82.72 lakhs

5b. Co-Principal Investigator (Co-PI)
Name: Dr. S.K. Singh
Designation: Principal Scientist (Agronomy)
Date of Birth: 01-01-1958
Experience: (34 Years)
Number of Scheme handled: 10
Number of important research publications:40
Number of other Research Schemes (being carried out by Co-PI): 01
Title of Scheme (s) Sustainable and Resilient Farming System Intensification (SRFSI) in the Eastern Gangetic plains.
Name of the funding Agency: CIMMYT)
Period from 2014 to 2018 Grant: Rs. 1.80 Crores

6 A) *Collaborative Investigator (s) (separate set for each)

Name: Dr. BAL KRISHNA JHA
Designation: Senior Scientist (Horticulture)
Date of Birth: 15th June 1967
Experience: 17 Years
Number of research publications: 27 research papers in national and international journal, technical bulletins, book chapters and popular articles.
Number of other Research Schemes (being carried out by PI)
(1) Title of Scheme (S): Sustainable livelihood improvement through need based integrated farming system model in disadvantaged district of Bihar
(2) Name of the funding Agency: NAIP
Period from 2008 to 2013

(II) Title of Scheme (S): Standardization of planting geometry and growth stage based fertigation pattern for commercial cultivation of selected vegetables using drip irrigation system
Name of the funding Agency: NABARD
Period from 2012 to 2015, Grant: 21.0 lakhs

B) *Collaborative Investigator (s) (separate set for each)
Name: Dr. SUSHANTA KUMAR NAIK
Designation: Senior Scientist (Soil Science)

Date of Birth: 30th June 1975
Experience: 12 Years
Number of research publications: 47 research articles, 03 technical bulletins, 03 extension folders, 08 popular articles
Number of other Research Schemes (being carried out by PI)
Title of Scheme (S) Acid soil management by use of basic slag
Name of the funding Agency: Tata Steel, Jamshedpur
Period from August 2014 to August 2016 Grant: Rs 12.55 lakhs.

C) *Collaborative Investigator (s) (separate set for each)

Name: Dr. Santosh S. Mali
Designation: Scientist (SWCE)
Date of Birth: 4-03-1981
Experience: 08 Years
Number of research publications: 12 research papers in national and international journal, technical bulletins, book chapters and popular articles.

7 ***Objectives** (in brief):

i. To develop, demonstrate and validate CA-based crop management technologies for improving the productivity of rice-fallows in rainfed ecosystems of eastern regions.

8 ***Practical/Scientific Utility**:

Soil and water are the two major limiting factors responsible for low productivity of crops in rice-fallows. Resource conservation technologies (RCTs) could be an appropriate approach to address the problems in rice-fallows. After harvesting of rice crop low moisture content in soil followed by fast decline in water table with the advancement of *rabi* season results in mid-and-terminal drought at flowering and reproductive stages adversely affects the productivity of crops in rice-fallows. Therefore, if crop residues are retained on the soil surface in combination with suitable planting techniques, it may alleviate terminal drought stress by conserving soil moisture and bring overall improvement in resource management. Zero tillage with minimum disturbance of soil and management of crop residues could lead to favourable effect on soil properties that further enhance the overall resource enhancement and productivity capacity in rice-fallows. This will also reduce cost of cultivation, and improved input-use efficiency making cultivation in rice-fallows more remunerative. Fodder (green/dry) scarcity for livestocks during *rabi* season is also an important issue in rice-fallows. Improving cropping intensity of rice-fallows may in-turn, help in meeting out the fodder requirement during lean period. The simple technologies like seed priming, spraying of 2% urea and micronutrients, etc., at vegetative stsges can substantially increase the productivity to remunerative levels for the resource-poor farmers in this difficult environment. Further, it is suggested that the RCTs can act as a catalyst for the introduction of further

technologies that will permit reliable and profitable cultivation of post-rainy-season crops and thus improve the livelihoods of the rural population.

9 *Research work conducted

i. At sponsoring institutions:

In direct-seeded rice- fallow systems, different *rabi* crops were evaluated. Results revealed that linseed and mustard were found promising with 1-2 supplemental irrigations in Jharkhand. Under assured irrigation system, winter and summer vegetables like tomato, potato and brinjal (in winter); and cowpea, bottle gourd, okra, etc were found promising and remunerative in Ranchi district of Jharkhand. In north Bihar under low lying areas, surface seeding of wheat in transplanted rice is a common practice.

ii. In other institution of the country:

In rice-fallows, linseed was found more productive and remunerative at RAU, Pusa, Bihar (Thakur *et al*. 1997). At CRRI Cuttack, Rao *et al*. (1982) evaluated various *rabi* crops grown on residual moisture after harvest of rice on upland rainfed soil and found that safflower was the most remunerative followed by blackgram, lentil, mustard and niger. Kar *et al*. (2007) also found safflower as the most remunerative crop in rice-fallows in Orisa. Mulching with paddy straw and water hyacinth were found to increase the productivity of groundnut sown after rice (Chandra and Choubey, 2003). At IIPR, Kanpur, no-till drill for small farmers, having low purchasing power, was developed for line sowing in rice-fallow. This helped in more moisture retention as least soil disturbance occurred. By use of this no-till drill, the seeding was done timely at a reduced cost.

iii. Other countries

In north-western Bangladesh, chickpea is a promising post-wet-season crop to follow rainfed rice in the High Barind Tract. Yields in farmers' fields, however, remain low (<1 t ha^{-1}) primarily due to poor crop establishment, late sowing, and terminal drought and heat stress. Thirty trials were conducted entirely on residual soil moisture in farmers' fields. Seed priming (soacking of seeds overnight) significantly increased the seed yield by 47%. The priming response was attributed mainly to rapid seedling establishment, with higher plant stand and earlier crop maturity allowing escape from end-of-season stresses. Priming also reduced the incidence of stem and root diseases, and increased nodulation by native rhizobia.

10 Technical Programme:

Items of Investigation

i. Selection of appropriate rice varieties and management practices for successful introduction of *Rabi* crops.

ii. Construction of water harvesting reservoirs and farm ponds to provide life-saving irrigation.

iii. Mechanization of field operations.

iv. Scaling-up crop management practices like, tillage and plant population management, early maturing crop varieties, application of nutrients and weed management, water management, mulching, relay cropping, foliar spray of nutrients, seed treatment, seed priming, inoculation with *Rhizobium*, insect-pest management, etc.

11 Facilities Available:

Equipments/instruments/ apparatus: (1) Nitrogen analyzer
(2) Flame photometer
(3) Atomic Absorption Spectrophotometer
(4) Muffle furnace
(5) Hot air oven
(6) pH meter
(7) EC meter
(8) Millipore water purification system
(9) Rotary shaker
(10) Hot plate

Area of experimental fields (hectares):

(a) **Bihar** (Patna, Vaishali and Gaya districts)
Farmerôs field: 1.5 ha

(b) Jharkhand

Farmerôs field at Jharkhand: 2.4 ha
ICAR-RCER, RC, Ranchi farm: 0.1 ha

(c) Chhattisgarh

Farmerôs field at Chhattisgarh: 2.4 ha

Laboratory: Yes

Other facilities: (1) Tractor, cultivator, seed drill, disc harrow, disc plough.

12 Additional facilities required*:*

Equipment & apparatus:

(1) Soil moisture meter (1.0 lakh)

(2) Soil penetrometer (0.75 lakh)
(3) UV-VIS Spectrophotometer (5.0 lakhs)
(4) Wet sieving apparatus (0.80 lakh)
(5) Zero-Till seed-cum-fertilizer drill (02) (1.00 lakh)
(6) Happy/Turbo seeder (02) (2.50 lakh)
(7) Rotavator (02) (2.20 lakh)
(8) Plot seeder (02) (2.50 lakh)

13 **Duration**: 2 years (2015-16 to 2016-17)

*Detailed information with regard to Sr. No. 6, 7, 8 and 9 may be furnished separately as supplementary annexure.

12. Estimation of Costs:
i) Sr. Research Fellows: 3
ii) Field Assistant: 2
i) Other contractual services: As per requirement

14 Recurring and Non-recurring contingencies: Rs. 25 lakhs (details given below)

Recurring and Non-recurring contingencies	**Year-I (2015-16)#**
Capital	
Equipment/ Machinery/ Apparatus/ Misc. items[@]	3.0
Revenue	
Contractual service (SRF 3 & other contractual services)	11.0
TA	1.0
Other recurring contingencies including institutional charges*	10.0
Total	**25.0**

***Institutional charges @10% of RC for lead institute and 5%of RC for cooperating institutes**
 # As per the new BE (2015-16). Original sanctioned total project budget is 63 crore.
[@]Computer/Air Conditioner/ Furniture as per absolute requirement of the budget.

15 Receipts anticipated : NIL

UNDERTAKING

16 Certified that:

i. The research work proposed in the Platform Project (**Evaluation of Conservation Agricultural (CA) practices under Rice-fallow system of Eastern Region**) does not in any way duplicate the research work already done and being carried out elsewhere on the subject.
ii. The present scheme cannot be combined with any scheme financed by the Council, Central and State Governments, Universities or Private Institution of their own funds.
iii. Necessary financial provision for the platform project will be made in the Institution/ University/ State budget in anticipation of the sanction to the scheme by the council.
iv. We undertake to abide by the guidelines provided by the Council for the implementation of the Platform Project.

Principal Investigator **Signature**

Name: Dr. JS Mishra

Certified that:

i. Project is in line with the approved mandate of the implanting institute.
ii. Platform Project Investigator/ Co-investigators are competent technically to undertake the project.
iii. Research work will not amount to duplication of efforts and In-house projects, handled by me will not suffer.
iv. Equipment and other infrastructure proposed under the project are either not available with the institute or the available facility cannot be extended to the project activities.
v. Basic facilities such as Telephone/ Fax/ photocopies/Generators etc. will be provided by the implementing agency. However, operational cost for these activities will be met from the institutional charges sanctioned under the scheme.
vi. The cost of equipment and other infrastructure requested for under the project is realistic and based on the prevailing market rates.
vii. Justifications and clear specifications for the equipment and other infrastructure asked for are reflected in the proposal.

viii. For collaborative projects with other institutions, the administrative/ financial/ technical issues related to implementation of the project shall be addressed between the two implementing agencies.

ix. The institutions has already furnished to the ICAR, full accounts and Utilization Certificates in respect of the grants received by it previously, as per the following details:

ICAR's amount	UC & Accounts furnished

Communication of Grant by the Institution and date of (Please indicate the Sanctioning Grant number and date of the communication with which ASAs, etc. are sent)

(1)_____(2)_____(3)

It is certified that the Institution has not received any grant from the ICAR previously.

Date: **Executive Authority of the Institution**

Supplementary annexure

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