ICAR National Fellow: Bio data of the Applicant

1.	Name:	SUNIL ARCHAK
2.	Present affiliation and address:	Senior Scientist Officer In-charge (AKMU and ITMU) NBPGR, New Delhi 110012
3.	Contact details (Email, Phone, Fax & Mobile)	Mob. 9999 42 1947 Tel. 25846074 Fax. 25849459 sarchak@nbpgr.ernet.in; sunil.archak@gmail.com; sunil.archak@hotmail.com
4.	Date of birth:	29-10-1970
5.	Nationality:	Indian
6.	Post presently held along with the pay-scale and period:	Senior Scientist Rs.37400-67000 PB:Rs.9000 From 02-07-2011 till date

7. Academic qualifications:

Examination passed and major subjects	Board/ University	Year	Marks/ distinctions
X Science, Maths, SST Kannada, English, Hindi	KSEEB, Bangalore	1986	85%
XII PCMB, French, English	Board of Pre-University Education, Bangalore	1988	75%
B.Sc. (Agriculture)	UAS, Bangalore	1993	CGPA 3.99/4.00 *5 gold medals & 3 awards*
M.Sc. (Molecular Biology and Biotechnology) *Thesis: "Development of Bt-transgenic cauliflower"*	IARI, New Delhi	1995	CGPA 4.00/4.00 *IARI merit medal*
Ph.D. (Biotechnology, Plant Sciences) *Thesis: "Bioinformatic Analysis of Non-canonical Plant microRNA Targets and a Plant Specific Repeat Protein"*	University of Hyderabad	2008	Coursework performance "A"

8. Employment Record:

Post	Scale	Employer	From	To	Major responsibilities
Scientist	8000-13500	ICAR (NBPGR)	18-09-1997	17-09-2003	Research
Scientist Senior Scale	8000-13500	ICAR (NBPGR)	18-09-2003	01-07-2008	Research and Teaching
Senior Scientist	15600-39100 PB:8000	ICAR (NBPGR)	02-07-2008	01-07-2011	Research, Teaching and management
Senior Scientist	37400-67000 PB:9000	ICAR (NBPGR)	02-07-2011	Till date	Research, Teaching and management

9. Research/ teaching experience:

i) Research experience and achievements:	
Following projects implemented (major output listed under each project in italics)	
Institutional projects	
i. Development of genomic tools for enhanced utilization of under-utilized crops (NBPGR) *New markers and cDNA sequences developed/used in buckwheat and guar*	PI
ii. Establishment of national genomic resources repository (NBPGR) *The repository has been established in terms of space, infrastructure and procedures. Necessary forms for submission/requisition of genomic resources developed. Repository website constructed (www.nbpgr.ernet.in/repository/home.htm)*	PI
iii. Development of genomic tools for enhanced utilization of horticultural crops (NBPGR) *New markers and cDNA sequences developed/used in brinjal, bitter gourd and chillies*	Co-PI
Externally funded projects	
i. Establishment of National Rice Resource Database (DBT) *NRRD portal developed (www.nbpgr.ernet.in/nrrd)*	Co-PI
ii. Establishment of national agricultural bioinformatics grid in ICAR (NAIP) *Commissioned NBPGR grid domain and organized trainings*	Co-PI
iii. Acquisition, evaluation and identification of climate resilient wheat and rice genetic resources for tolerance to heat, drought and salt stresses (NICRA) *Participated in data management of 22k wheat (biotic and abiotic stress evaluation, characterization, core development and molecular analysis initiative)*	Co-PI
iv. Utilization of *ex situ* collections and climate analogues for enhancing adaptive capacity to climate change (CCAFS) *Completed geo-referencing and climate matching in sorghum (10947 accessions), wheat (9499 accessions), pigeon pea (6167 accessions), chickpea (3293 accessions) and pearl millet (8220 accessions)*	PI

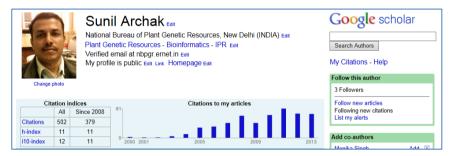| ii) Teaching experience and achievements:	
Dual Faculty member in disciplines of Bioinformatics as well as Plant Genetic Resources (PGR), IARI, New Delhi	
Course leader/co-course leader	
Bioinformatics	
BI507	Bioinformatics (3L+ 1P)
BI523	Advanced techniques for sequence and structure analysis (1L+ 2P)
BI526	Comparative genomics (1L+ 1P)
BI527	Phylogenetic analysis (1L+ 1P)
BI528	Chemoinformatics and IPR issues (1L+ 1P)
PGR	
PGS503	Intellectual property and its management in agriculture (1L+ 0P)
PGR505	Biotechnology in plant genetic resource management (3L+ 2P)
PGR507	Information management in plant genetic resources (2L+ 1P)
PGR607	Regulatory mechanisms and intellectual property rights (3L+ 1P)
Achievements	▪ Designed the pedagogy of PGS503 and *teaching in every trimester* ▪ Hosting a course website at www.nbpgr.ernet.in/pgs-503.htm ▪ Redesigning the Bioinformatics (M.Sc.) and designing Bioinformatics (Ph.D.) courses
Students guide	▪ Two M.Sc. (PGR); one M.Sc. (Bioinformatics)

Significant scientific output

DNA Marker Technology: Applicant's pioneering work on development of markers for molecular characterization of cashew is recognized worldwide (*96 citations*). His DNA fingerprint data gave empirical evidence to the perception that genetic base is narrowing in Indian tomato cultivars (*25 citations*). The nominee has developed DNA markers and generated DNA fingerprints in many other crops (*66 citations*). Using the power of DNA markers he has also provided evidence for introduction and spread of cashew in India (6 *citations*) that now assists researchers better manage cashew germplasm. His work on Basmati microsatellite markers (*43 citations*) has led to cultivar identification protocol.

PGR and IPRs: The applicant was part of NBPGR's foray into policy issues before plant variety protection laws were enacted in the country (*17 citations*). This helped develop course curriculum for "Intellectual Property and its Management in Agriculture" which is a compulsory course for Ph.D. students of all the disciplines of IARI.

Genomics and Bioinformatics: The applicant has carried out excellent basic research in the area of genomics starting from whole genome analyses for microsatellites (*102 citations*), microRNA targets and plant specific repeat proteins (*23 citations*) as well as initiated work on PGR informatics (*1 citation*).

PGR Informatics: The applicant leads the PGR Informatics team at NBPGR. The achievements entail (i) establishment of necessary infrastructure including server for 24X7 operationality; (ii) implementing an institutional e-mail system; (iii) developing a new contemporary CMS website of NBPGR (*www.nbpgr.ernet.in*); (iv) developing user-friendly web servers to search Registered Crop Germplasm (*www.nbpgr.ernet.in/IRCG*) and Multi-location Evaluation Data (*www.nbpgr.ernet.in/tsgi*); (v) developing and implementing PGR Portal (*www.nbpgr.ernet.in/pgrportal*).

Technologies and their impact:

1. The applicant's work on Basmati DNA markers has resulted into a patent "*Single tube multiplex assay for detection of adulterants in basmati rice samples*" (European Patent Number: EP2013359 (A1); United States Patent Application 20110086764; and Indian Patent 260/MAS/2002). Consequently a *Basmati Verifiler Kit* has been commercialized for identification of authorized Basmati cultivars and detection of adulteration *(LabIndia product No. BV81001).* The kit has established the superiority of Indian Basmati by eliminating adulterants.
2. The applicant was part of the team that developed the "*DNA markers to distinguish citrus root stocks*". NBPGR has transferred the technology to two recipients on commercial basis. The technology helps maintain the citrus germplasm on healthy rootstocks.
3. PGR Portal is acknowledged as of international standards and welcomed by users. The Portal has clocked 4,520 page views in past two months (*source: Google analytics*). PGR information access by in-house as well as external users is day by day going exclusively on-line.

10. List of important research publications (during the last 10 years) with NAAS rating:

Publications (Chronological)	NAAS Journal ID	NAAS Rating
International		
1. **Archak S** and Kumar V (2013). Portable search engine for registered crop germplasm: a new concept for enhancing access to information on plant genetic resources. *Plant Genetic Resources: Characterization and Utilization* 11: 62-67.	Thomson Reuters IF: 0.728	7.2
2. Agrawal RC, **Archak S**, Tyagi RK (2012). An overview of biodiversity informatics with special reference to plant genetic resources. *Computers and Electronics in Agriculture* 84: 92-99.	C095	7.6
3. **Archak S**, Gaikwad AB, Swamy KR, Karihaloo JL (2009). Genetic analysis and historical perspective of cashew (Anacardium occidentale L.) introduction into India. *Genome* 52:222-30.	G017	7.6
4. **Archak S** and Nagaraju J (2007). Computational prediction of rice (Oryza sativa) miRNA targets. *Genomics, Proteomics and Bioinformatics* 5: 196-206.	Elsevier 0.724	7.2
5. Vemireddy LR, **Archak S**, Nagaraju J (2007). Capillary Electrophoresis Is Essential for Microsatellite Marker Based Detection and Quantification of Adulteration of Basmati Rice (*Oryza sativa*). *Journal of Agricultural and Food Chemistry* 55:8112-8117.	J021	7.8
6. **Archak S**, V Lakshminarayanareddy and Nagaraju J (2007). High-throughput multiplex microsatellite marker assay for detection and quantification of adulteration in Basmati rice (*Oryza sativa*). *Electrophoresis* 28:2396-405.	E028	7.9
7. **Archak S**, Eshwar Meduri, Sravana Kumar P and Nagaraju J (2007). InSatDb: A microsatellite database of fully sequenced insect genomes. *Nucleic Acids Research* 35: D36-D39.	N055	8.9
8. **Archak S** and Nagaraju J (2006). Eicosapentapeptide repeats (EPRs): novel repeat proteins specific to flowering plants. *Bioinformatics* 22: 2455-2458.	B063	8.3
9. Prasad MD, Muthulakshmi M, Madhu M, **Archak S**, Mita K and Nagaraju J (2005). Survey and analysis of microsatellites in the silkworm, Bombyx mori: Frequency, Distribution, Mutations, Marker potential and their Conservation in heterologous species. *Genetics* 169: 197-214.	G013	8.1
10. Yashodha R, Kathirvel M, Sumathi R, Gurumurthi K, **Archak S**, Nagaraju J (2004). Genetic analysis of Casuarinas using ISSR and FISSR markers. *Genetica* 122: 161-172.	G011	7.7
11. Pradeep T, Karihaloo JL, **Archak S** (2003). Molecular characterization of Piper nigrum L. cultivars using RAPD markers. *Genetic Resources and Crop Evolution* 50: 469-475.	G010	7.6
12. Karihaloo JL, Dwivedi YK, **Archak S** and Gaikwad AB (2003). Analysis of genetic diversity of Indian mango cultivars using RAPD markers. *Journal of Horticultural Science & Biotechnology* 78: 285-289.	J204	7.1
13. **Archak S**, Gaikwad AB, Gautam D, Rao EVVB, Swamy KRM and Karihaloo JL (2003). Comparative assessment of DNA fingerprinting techniques (RAPD, ISSR and AFLP) for genetic analysis of cashew (Anacardium occidentale L.) accessions of India. *Genome* 46: 362-369.	G017	7.6
14. **Archak S**, Gaikwad AB, Gautam D, Rao EVVB, Swamy KRM and Karihaloo JL (2003). DNA fingerprinting of cashew varieties of India using RAPD and ISSR techniques. *Euphytica* 130: 397-404.	E081	7.6
15. Tejaswini, Prakash TN and **Archak S** (2003). Bioinformatics: a strategy to link in situ conservation and to reward people. *Acta Horticulturae* 623: 123-130.	--- ISHS	6.1
National		
16. Gaikwad AB, **Archak S**, Saxena S (2013). Technology development for identification of citrus (*Citrus* spp) rootstocks based on Sequence Tagged Microsatellite marker. *Indian Journal of Agricultural Sciences* 83: 1110-1112.	I023	6.6
17. Randhawa GJ, Singh M, Gangopadhyay KK, Kumar G, **Archak S** (2012). Genetic analysis of fenugreek (*Trigonella foenum-graecum*) accessions using morphhometric and ISSR markers. *Indian Journal of Agricultural Sciences* 82: 393-401.	I023	6.6

11. Honours and Awards:

i) Membership of National/ International Academies: None
ii) National/ International Awards/ citations/ recognitions:

- *Fellow* of Indian Society of Plant Genetic Resources (2009)
- *Consulting contract* No. 4500013658 ($ 100,000) to implement a Climate change and food security CCAFS (CGIAR) programme

12. Any other specific point that the applicant would like to mention in support of his/ her application:

The applicant has been recognized as NARS expert in JMP Genomics. Further, he has conducted a national training programme on "Conservation of Genomic Resources" (NAIP; Course Director) and an international training programme on "Application of GIS and climate modeling in PGR" (Course Coordinator). He is currently working on establishing *basic research connect between PGR, genomics and informatics*.

I hereby declare that the statements made in the application are true and certify that no

vigilance /disciplinary proceedings are pending against me.

Signature of the Applicant

Date: 14 Oct 2014   Name: Sunil Archak

Place: New Delhi   Designation: Senior Scientist

ICAR National Fellow: Research Project Proposal

1. Title of the Project:

   Development and implementation of Novel Algorithms and Software Modules for PGR Informatics

2. Objectives:

   1. Development of data standards and algorithms for PGR informatics
   2. Development of algorithms and modules for PGR analytics and bioinformatics
   3. Development of algorithms and modules for user-centric approach to PGR informatics to encompass genetic, genomic, taxonomic, geoinformatic, bioinformatics, etc. linkages with genebank information

3. Name and address of the sponsoring institution:
   ICAR-National Bureau of Plant Genetic Resources, Pusa Campus, New Delhi 110012

4. Detailed justification indicating therein as to how the project will add to our present knowledge and create a culture of basic research in the National Agricultural Research System:

   It is needless to emphasize the dependence of varietal development programmes on the availability of plant genetic resources (PGR). PGR utilization depends upon the access to information. Lack of an operational PGR portal has led to redundant investments in PGR characterization and evaluation and notably inefficient utilization of valuable genetic resources.

   An effective PGR Informatics can only be built upon sound scientific grounds which go beyond computer expertise to encompass genetic, taxonomic, geoinformatic, bioinformatic and genomic linkages. A user-centric approach is needed that includes (i) *Growth* – through richer content and metadata especially field genebanks, horticultural genetic resources and farmers' efforts; (ii) *Scalability* – through established architecture and decentralised services; (iii) *Capacity* – through development of appropriate tools, products and services; (iv) *Visibility* – through development of a powerful and user-friendly data portal, nodes, thematic portals and rich internet applications. Research and development in PGR analytics will accelerate cognitive decisions that facilitate PGR utilization. PGR analytics, at varying levels of analysis and complexity, includes (i) Descriptive - reporting and querying of data to identify problems and solutions; (ii) Predictive - modelling, forecasting, and simulating outcomes based on the data; and (iii) Prescriptive - recommend the best course of action based on the data.

   Above-mentioned developments are not possible without laying down data standards as well as benchmarks for algorithms and modules. These in turn can't be developed without creating sufficient knowledge body based on basic research in PGR Informatics. NBPGR is the nodal organization for PGR management in NARS. By implementing the proposed project at NBPGR, nucleus of basic research in the field of PGR Informatics is expected to be created facilitating an environment of fundamental research.

5.   Review of literature (showing the status and critical gaps, not exceeding one page):

What is PGR Informatics?

Plant Genetic Resources (PGR) informatics, an emerging interdisciplinary science, is the application of information and communication technologies to collect, organize and analyze biological and environmental data about germplasm collections including phenotyping, genotyping, remote sensing, and phylo-climatic modelling.

Status of PGR Information Systems

The genebank information systems are limited to 11 CGIAR genebanks and seven major national genebanks and is implemented at multiple levels: (i) *Genebank level* (e.g. CGN-PGR, Netherlands; IPK, Germany; CRF, Spain; VIR, Russia; EMBRAPA, Brazil; Kew's, UK; NIAS, Japan); (ii) *National level* (e.g. AusPGRIS, Australia; PGRC, Canada; NORDGEN; ARS-GRIN, USA); (iii) *Regional level* (e.g. EURISCO, Europe; EAPGREN, Eastern African Nations; REMERFI, Latin America; SPGRC, South African Countries; GRENEWECA, West and Central Africa); and (iv) *Global level* (System-wide Information Network for Genetic Resources, SINGER and GENESYS; Global Biodiversity Information Facility, GBIF). USDA genebank has developed an information management system called *GRIN Global* in 2008 (collaborative efforts of GCDT, Bioversity, USDA-ARS at $2.5 million). In 2010, *GeneSys*, a web portal for all the CG genebanks as well as EURISCO information system was launched. Unfortunately, at the other end of the spectrum, almost all the gene rich countries absolutely lack informatics facilities. NBPGR has databases and portal in place, which cater to requirements of documentation and sharing of genebank information[1].

Status of Research in Tools and Algorithms

A number of tools and algorithms have been developed in the field of informatics applicable in distinct areas like banking, clinical studies, engineering, social sciences and forensics. Some examples in biology include tools like *Darwin Core Archive* and communication protocols namely DiGIR, BioCASE, TAPIR–TDWG, etc. *However, customizing available algorithms for PGR informatics continues to remain a challenge*.

Critical gaps and need for Basic Research

(i) Germplasm information management suffers not only because of inadequate digitization, collation and curation of data but also because the neither the information is standardized nor the compatible software and data models implemented; (ii) Absence of all-encompassing scientific questions to guide PGR informatics is resulting in developments that have no connection to genuine insight and forward progress. Researching on the links between diverse dimensions of plant genetic diversity– conservation status, taxonomy, distributional biology, ecology, interactions, genomics, and phylogenetics– will enable a transition from data management to informatics science; (iii) Lack of emphasis on PGR Analytics to facilitate cognitive decisions; (iv) Typically, data availability and technology have driven many of the ideas and concepts in the PGR informatics field. The desirable state of the field would see ideas and concepts driving development of new technology and new data resources.

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[1] Agrawal RC, Archak S, Tyagi RK (2012). An overview of biodiversity informatics with special reference to plant genetic resources. *Computers and Electronics in Agriculture* 84: 92-99.

6.   Technical Programme (with activity milestones and time-frame):

	Activity Milestone	Year1	Year2	Year3	Year4	Year5
1.	Commissioning of the infrastructure and personnel	▓				
2.	Algorithmic analysis, design, application development and testing	▓	▓			
3.	Development of software modules for PGR Informatics		▓	▓		
4.	Development of software modules for PGR Analytics			▓	▓	
5.	Development of a central PGR portal			▓	▓	
6.	Development of software modules for retrieving data from multiple heterogeneous databases		▓			
7.	Development of bioinformatics modules for analysis related to PGR		▓		▓	
8.	Report writing, Publications of manuals and books	▓	▓	▓	▓	▓

7.   Specialized Training programmes (national/ international) proposed to be organized/ books to be written, and courses to be taught.

Proposals for books to be written:

(i)   PGR Informatics: A game changer or changing games
(ii)   PGR informatics and analytics: components and framework

Proposals for courses to be taught:

(i)   Information management in plant genetic resources (2L+ 1P)
(ii)   Bioinformatics (3L+ 1P)
(iii)   Advanced techniques for sequence and structure analysis (1L+ 2P)

8.   Expected output(s) particularly on time scale (please quantify):

	Expected output	Year1	Year2	Year3	Year4	Year5
1.	Commissioning of the infrastructure and personnel	▓				
2.	Novel algorithms for PGR Informatics and Analytics		▓	▓		
3.	Software modules for PGR Informatics			▓	▓	
4.	Software modules for PGR Analytics				▓	▓
5.	Central PGR portal			▓	▓	▓
6.	Bioinformatics modules for analysis related to PGR			▓		▓

9.   Expected impact of the output(s) on the agriculture of the country:

A robust national PGR Portal for researchers, students, breeders, policy makers, and farmers expected to facilitate greater utilization of plant genetic resources and accelerated incorporation of diversity into varietal chain.

10.   Budget requirement (year-wise, head-wise, with list of equipment) **Rs. 116 lakh**

Figures in Lakh Rupees	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Revenue Costs						
Manpower$	8.5	8.5	8.5	9	9	**43.5**
Research contingency# (@4 per yr)	4	4	4	4	4	**20**
TA/DA (@0.75 per yr)	0.75	0.75	0.75	0.75	0.75	**3.75**
Total recurring cost	13.25	13.25	13.25	13.75	13.75	**67.25**
Capital Cost						
Equipment* (@6.75 per yr)	20.25	6.75	6.75	0	0	**33.75**
Furnishing and fixtures	5	5	5	0	0	**15**
Total non-recurring cost	25.25	11.75	11.75	0	0	**48.75**
Total cost	**38.5**	**25**	**25**	**13.75**	**13.75**	**116**

$ Salary of 1RA@30K pm + 1SRF@22K pm + 1JRF@16K pm (three persons with different skill sets are essential for achieving projected objectives)

Includes operating costs, meetings, conference and symposia (organizing and attending), publications, contractual manpower for data entry and secretarial assistance, buying consumables

* Equipment include high-end server, workstations, mobile workstation and accessories (including various software and their license subscriptions); Internal and external hard-drives, flash-drives and accessories; networking hardware and accessories. The purchase will be made as per latest specifications in vogue and as per needs. Total equipment cost is 29% of the total budget.

11.   Additional information by the applicant, if any.

PGR informatics is a significant activity at NBPGR. To carry out basic research to develop algorithms and software modules, one needs adequate hardware infrastructure. Immediate requirements for the proposed objectives are reflected in the project; other infrastructure needs are expected to be fulfilled by institutional funding and other extra-mural funding.

Signature of the Applicant

Place: 14 Oct 2014   Name: Dr. Sunil Archak
Date: New Delhi   Designation: Senior Scientist

MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN
(i). INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR), NEW DELHI,
(ii). THE _ICAR - NATIONAL BUREAU OF PLANT GENETIC RESOURCES_
(SPONSORING/PARENT INSTITUTION)
AND
(iii) Dr. _SUNIL ARCHAK_
(ICAR NATIONAL FELLOW)
IN IMPLEMENTATION OF THE SCHEME ON ICAR NATIONAL FELLOW

The memorandum made this _27th_ day of _November_ 200 4 between the Indian Council of Agricultural Research (ICAR), a society registered under the Societies Registration Act-1860 having its office at Krishi Bhavan, Dr. Rajendra Prasad Road, New Delhi-110 114, hereinafter called "the Council" or the **first party**, the ~~Sponsoring~~/Parent Institution _ICAR - National Bureau of Plant Genetic Resources_ established/ registered under the ___ - ___ Act, ___ - ___ of the State of ___ - ___ hereinafter called the "Sponsoring Institution" or the **second party**, and Dr. _SUNIL ARCHAK_ working as _Sr. Scientist_ hereinafter referred to as the "ICAR National Fellow" or the **third party** witnessed as under:-

1. Whereas the Indian Council of Agricultural Research (ICAR), the **first party** has formulated a scheme of ICAR National Fellow under the Education Division, ICAR, to promote excellence at national level in agricultural research and education and to recognize the meritorious contribution of individual agricultural scientists/teachers and facilitate their research and related activities.

2. And whereas the Sponsoring Institution, the **second party** has agreed to sponsor Dr. _SUNIL ARCHAK_ for carrying out the work of ICAR National Fellow at its institution under the above scheme.

3. And whereas it has been decided, after due process of selection, to offer the appointment on the position of ICAR National Fellow to Dr. _SUNIL ARCHAK_, the **third party**.

4. Now, therefore, the Council, the Sponsoring Institution and the ICAR National Fellow appointee have decided to pool their resources of money, scientific manpower, skill, equipment and other facilities in accordance with this Memorandum of Understanding and on terms and conditions contained hereinafter and it is mutually agreed as follows:

ARTICLE - I

5. The ICAR National Fellow will conduct research on the project entitled,
" _DEVELOPMENT AND IMPLEMENTATION OF NOVEL ALGORITHMS AND SOFTWARE_ " at _ICAR-NBPGR_
MODULES FOR PGR INFORMATICS

ARTICLE - II

Obligations on the part of the Council, the first party:

6. To provide the funding support for research under the National Fellow project as in Clause 5 as per provision of the approved project through the Sponsoring institution in annual installments. The budgetary grants towards the approved cost of the project on recurring and non-recurring items will be subject to the limitations imposed by the Government of India from time to time on budget and manpower.

6.1. To provide funds for payment of salary of the ICAR National Fellow and allowances as admissible to him on his pay, employer's contribution of General/Contributory Provident Fund, Leave Salary etc through the Sponsoring Institution.

6.2. To take necessary steps to periodically assess the progress of work of the project and further grants and continuation of the scheme will be based on such assessments and evaluations. If the Council comes to the conclusion that work of the project is not satisfactory, it can terminate the project/contract by giving one month's notice.

6.3. The Council will not be responsible for continuation and protection of service interests of ICAR National Fellow in his/her sponsoring institution.

6.4. The Council will have no financial liability after the National Fellow project is completed or ceased due to any reason.

6.5. The Council shall not be responsible for absorption of ICAR National Fellow or any staff engaged for the project work after completion/termination of the project.

ARTICLE - III

Obligations on the part of the Sponsoring Institution, the second party:

7. The Sponsoring Institution, the Second Party, agrees to abide by the following terms and conditions:

7.1. To undertake to provide the logistics, comprising necessary basic facilities and administrative support for the efficient functioning of the project work of ICAR National Fellow, the third party.

7.2. To permit ICAR National Fellow to retain/use all office facilities including accommodation and telephone both at the office and residence, and to provide, as far as possible, such facilities if not already available during the currency of ICAR National Fellow project.

7.3. To take expeditious action to recruit staff, to provide the agreed facilities for the project and to ensure that the ICAR National Fellow is associated with the selection of staff engaged in the project.

7.4. To give the ICAR National Fellow autonomy of operations in implementation of the work plan of the approved project including the operation of the funds within the approved budget heads following the procedures of the sponsoring Institution. No re-appropriation of funds from any one budget head to another by the ICAR National Fellow/sponsoring Institution would be permissible. Re-appropriation of funds from one budget head to another, if needed, would require prior approval of the Council

7.5. To administer control and provide administrative and financial/accounting support for the ICAR National Fellow project.

7.6. To allow ICAR National Fellow to sanction purchase of items of recurring and non-recurring nature subject to conforming to the purchase procedures followed in the Sponsoring Institution.

7.7. To permit ICAR National Fellow to be a member of the Teaching Faculty, wherever applicable and permit him/her to appropriately share the institutional facilities required for his/her work.

7.8. To maintain, in good condition, all equipments, stores and other items of capital nature acquired under the project out of the grants received from the Council and to maintain relevant records for all such equipments such as Asset Register, consumable/non-consumable register, issue register and cash book etc.

7.9. To ensure that the equipments/assets remain the property of the Council until specifically transferred to the Sponsoring Institution/ICAR institution.

7.10. To submit a certificate of actual utilization of grants received, in respect of **non-recurring grants** within six months of the close of the financial year as per Rule 15(1) of GFRs and to submit Annual Utilization Certificate and Annual Audited Statement of Accounts in respect of **recurring grants** so as to ensure proper utilization of grants released for the preceding year before forwarding their demand for the subsequent year.

7.11. To permit ICAR National Fellow to join back on his initial position in the Sponsoring/parent institution after the National Fellow project work is completed or ceased due to any reason

7.12. The age of superannuation for an ICAR National Fellow, if not from an ICAR institution, would remain the same as in the Sponsoring/parent institution.

ARTICLE IV

Obligations on the part of the ICAR National Fellow or the third party:

8. The ICAR National Fellow agrees to abide by the following terms and conditions:-

8.1 To fully involve himself/herself in the research project agreed upon under this scheme and teach courses, where applicable, and not to engage himself/herself in any other work.

8.2 Not to accept foreign assignments before completing at least one year in the project/fellowship and not befitting his/her status in an international organization, for a total period of not more than three months during each term of five years (not allowed to be cumulative over the terms). Participation in conferences, seminars, symposium etc. will, not be construed as such an assignment.

8.3 Not to apply for, nor accept any other regular or term offer/appointment within the country or abroad before completion of at least three years as ICAR National Fellow. In case he/she has already applied for such a position, before accepting the appointment as ICAR National Fellow, he/she will have to withdraw such applications. On selection to the regular or term appointment and with effect from joining the same, the Fellow shall cease to be an ICAR National Fellow.

8.4 To submit technical, physical and financial progress of the project annually vis-à-vis projections made and targets set in the work plan of the approved project including activity milestones for the next year at the end of each financial year.

8.5 To submit any other information which may be called for by the Council relating to the project from time to time.

8.6 To protect the Intellectual Property Rights generated or likely to be generated during his/her tenure and to provide appropriate share to the Council on the patents/protections/knowledge generated as per the "ICAR Guidelines for Intellectual Property Management and Technology Transfer/Commercialization" as amended from time to time. If the Fellow enters into any other IP agreement, the same will be appropriately communicated to and shared with the Council. In all publications arising out of the National Fellow Project, the support from the Council should be duly acknowledged.

8.7 If the project involves the utilization of genetically engineered organisms, the National Fellow should submit an application through Institutional Biosafety Committee. He/she should also declare that while conducting experiments, the Biosafety Guidelines of the concerned department/sponsoring institution would be followed in toto.

8.8 If the project involves field trials/experiments/exchange of specimens etc., the National Fellow will ensure that ethical clearance would be taken from concerned ethical Committee/Competent Authorities and the same would be conveyed to the Education Division of ICAR before implementing the project.

ARTICLE - V.

9. Miscellaneous:

9.1 The offer of ICAR National Fellow should be consummated within three months from the date of issue of the order and no extension will be given beyond three months.

9.2 Any matter not covered specifically in this Memorandum of Understanding may be settled by mutual discussion. The decision of Director General, ICAR shall be final and binding on all the parties.

9.3 If any change in the approved programme/ personnel employed is considered essential, it will be done after the mutual discussion and agreement of all parties concerned

ARTICLE – VI

10. This Memorandum of Understanding (MOU) shall become effective on_____and from_____ and shall continue till. _____ and signed in presence of:
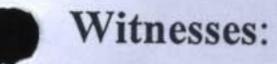
10.1 For Indian Council of Agricultural Research, New Delhi
   (First Party)
   Date:

10.2 For ~~Sponsoring~~/Parent Institution
   (Second Party)
   Date:

राष्ट्रीय पादप आनुवंशिक संसाधन ब्यूरो
National Bureau of Plant Genetic Resources
पूसा कैम्पस, नई दिल्ली–12
Pusa Campus, New Delhi-12

10.3 For ICAR National Fellow Dr. SUNIL ARCHAK
   (Third Party)
   Date: 14th Oct 2014

Witnesses:

i) _____   i) _____   i) _____
                              (K V BHAT)   (DR. AMBIKA B GAIKWAD)

ii) _____   ii) _____   ii) _____
                              (R K TYAGI)   RAJEEV GAMBHIR