

ICAR GUIDELINES FOR
Internal Evaluation and Forwarding
Research Papers to Scientific Journals
and
Data Management in ICAR Institutes



INDIAN COUNCIL OF AGRICULTURAL RESEARCH
NEW DELHI

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and
Data Management in ICAR Institutes**



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NEW DELHI

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These guidelines are published for adoption in ICAR institutes.

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Foreword

The Indian Council of Agricultural Research (ICAR) has always encouraged scholarly communications to disseminate the results of research pursuits to benefit the scientific fraternity and the users of research results. However, keeping in view the necessary requirement of assimilating IPR dimensions, as also the goals of an apex public sector organization as ICAR, a cautious and systematic approach has to be adopted in academic publishing and data management.

It has become necessary for institutions and researchers to adhere to the highest standards and practices in this direction. The Council has developed these guidelines to appropriately direct the researchers and research managers for working towards a healthy R&D environment, ensuring in the process the safety of research data records and the reliability of published works.

Earlier, in 1977, the ICAR instructed through an office order indicating a procedure for forwarding research papers to scientific journals. It did not cover the data management part. In this endeavour, the Council constituted a committee to formulate guidelines for internal evaluation and forwardal of research publications and for data management in the Institutes. In the present times, since it has become more than necessary to only have scientifically validated views, the aspects of secure data management have been specifically incorporated in these guidelines.

The Governing Body of ICAR Society in its meeting held on 12th March, 2014 has appreciated this effort, and approved its adoption in the ICAR system. It is hoped that agricultural universities and colleges in India would also consider adoption of these guidelines.

The Council acknowledges the valuable inputs of the Committee members and colleagues in the Council in formulation of the guidelines.



(S. AYYAPPAN)

Secretary, Department of Agricultural Research & Education
and

Director General, Indian Council of Agricultural Research,
Ministry of Agriculture, Krishi Bhavan,
New Delhi 110 001

Preface

Uniform procedures for publications and data management in the ICAR system have become increasingly important since we started focussing on assimilating the intellectual property and related dimensions. Accordingly, it was felt necessary to have our guidelines to provide appropriate directions to ICAR Institutes.

Earlier in ICAR, there were brief instructions issued vide F.No.10-11/77-Per.IV dated 9.11.1977 for forwarding research papers to scientific journals. However, there was no direction for best practices in data management. Therefore, to address and guide on these issues, Dr S. Ayyappan, the Secretary DARE & DG ICAR constituted a Committee under the Chairmanship of Dr A.K. Singh, Former Deputy Director General (Natural Resource Management) in ICAR.

The Committee reviewed the procedures currently adopted and followed in the ICAR institutes and also considered the best practices in other reputed institutes in India and abroad. The Committee was benefitted with information and comments from a large number of ICAR institutes, as also with input from different Subject Matter Divisions in ICAR. It gave considerable thought to the subject to develop these guiding principles.

I gratefully acknowledge the excellent leadership of Dr A.K. Singh, Former Deputy Director General (Natural Resource Management) in ICAR, whose guidance along with the learned Committee members led to this important outcome for the system. The contribution of the co-opted member Dr Sanjeev Saxena, Principal Scientist, ICAR; and Dr Rajender Prasad, Principal Scientist & Head IASRI is also acknowledged. During the process of Committee meetings, Drs Umesh Srivastava, B.B. Singh and N. Gopalakrishnan, the Assistant Directors General in ICAR, also contributed to the effort.

I am also grateful to all the Governing Body members for adopting the framework of these guidelines for implementation in the ICAR set up in its 230th meeting held on 12th March, 2014. Drs Shiv Datt, Vikram Singh and S.K. Yadav, my colleagues in the Intellectual Property and Technology Management Unit, along with other staff, provided the necessary support.

This exercise was initiated because of the vision and direction of Dr S. Ayyappan, Secretary DARE and DG ICAR; the head of ICAR/DARE family, who was always available with his much valued guidance. The Committee members and the staff of my Unit wish to express its gratitude for his encouragement.

I expect these guidelines to provide the ICAR's institutions and scientific fraternity the necessary guidance to manage its publications and data in a manner that our best practices followed are appreciated by everybody.



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Dr. S. Mauria
Assistant Director General
(Intellectual Property & Technology Management)

F. No. IP&TM-8(5)/2012-IPR

Dated the 21st September, 2014

To

The Directors of ICAR Institutes/Bureaux/Project Directorates/NRCs
and Project Coordinators

Sir,

A Committee (Office Order at Appendix I) to develop guidelines for internal evaluation and forwarding research papers to scientific journals and data management in ICAR institutes was constituted with Dr A.K. Singh, Former Deputy Director General (Natural Resources Management) in ICAR as its Chair. The report of the Committee was adopted by the ICAR's Governing Body in its meeting on 12th March' 2014.

A copy of the adopted contents is forwarded herewith for appropriate action by each ICAR institution. It has been decided to implement these guidelines in the ICAR set-up with immediate effect.

This issues with the approval of Secretary DARE and Director General ICAR.

Yours faithfully,

(S. Mauria)

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Chapter 1

Publications

1.1 Introduction

1.1.1 ICAR's instructions for forwarding of research papers to scientific journals were issued by ICAR vide F.No.10-11/77-Pers. IV, dated 9.11.1977 (Copy at Appendix II). In recent times, it, however, emerged that different ICAR institutes have different procedures for processing and forwarding of research papers and other materials for publication. It was, therefore, required that a uniform procedure that provides academic flexibility to accommodate independent scientifically validated views must be followed in all ICAR institutes while ensuring accountability of the authors for the information published.

1.1.2 Accordingly, the idea here is to reiterate the policy and bring it up to date with the present times. In explaining the procedure for guidance, the fundamental commitment of ICAR remains not to limit the freedom to publish and to maintain an academic environment that is open for free exchange of ideas.

1.1.3 These guiding principles and procedures are issued with the ICAR's belief that appropriate publication of the research findings not only extends their dissemination to a target audience, but also provides the researchers the opportunity to register their claim to the work they have done, and gain peer esteem and the rewards that may subsequently flow from their work.

1.1.4 Therefore, these guidelines have been developed with the objective to encourage publication of results emanating from research work in the ICAR system through a uniform procedure which simultaneously allows a systematic record keeping of ICAR's research contributions in each of the ICAR institute¹.

1.1.5 The following paragraphs, thus, cover all the procedural dimensions on this issue faced by ICAR institutes in their day-to-day operations. The Director of the Institute, therefore, shall be the Competent Authority to implement these instructions and take appropriate decisions as per these guidelines.

1.2 Communicating results of research

1.2.1 To maximize the benefits from research, publications resulting from research activities must be disseminated in the most effective manner and at the earliest opportunity. Exceptions may be appropriate in certain circumstances, such as restrictions stipulated in Institute/ICAR-approved agreements for collaborative/sponsored/contract research or to preclude disclosure prior to patent filing or for similar reasons.

1.2.2 Formal research publications can be communicated in the form of books, academic and professional journals; and through conferences and their proceedings. However, a variety of less

¹ ICAR Institute (or 'Institute') in these guidelines shall refer to the network of institutions of the ICAR, including Institutes designated with the prefixes Indian/National/Central, National Academy, National Bureaus, Project Directorates, and National Research Centres. These also include the Coordinating Units of All India Coordinated Research Projects (AICRP)/All India Network Projects (AINP) and the Krishi Vigyan Kendras (KVK) with ICAR.

formal means, including web-based publications and tools for social networking, are also now increasingly being used to disseminate information.

1.2.3 The best mode for publications arising from the research should be considered by the author(s) based on the status and reputation of the journal or publisher, the peer review process of evaluating the research outputs, access by other stakeholders to the work, the likely impact of the work on users of research, and further dissemination and production of knowledge.

1.2.4 The intended publication should provide an honest description and analysis of the findings by the authors. Plagiarism, fabrication of data, wilful deception or misinterpretation of results by selective reporting of data, as well as the theft of data or research results from others, shall constitute unethical scientific behaviour and shall not be acceptable under any circumstances.

1.2.5 Submission of the same work based on the same set(s) or subset(s) of data to more than one journal is unethical and should not be permitted.

1.2.6 If, after publication, any honest error is discovered in the publication, the author(s) shall be responsible to promptly retract the paper or notify the same to the journal's editor for publishing the erratum. Such honest error shall not be considered as an example of scientific misconduct. The institute should have a mechanism in place to minimize occurrence of such "honest errors".

1.2.7 Probable exceptions to point 1.2.5 may be writing of books/chapters/review articles etc., where there is full cross-referencing and which is fully acknowledged.

1.3 Authorship and acknowledgements

1.3.1 The authorship should truthfully reflect individual's contribution to the reported study. The sequence of authorship should be decided keeping in view the substantial contribution in conceptualization/design, or analysis and interpretation of data; and/or drafting the article or revising it critically for important intellectual content. In case of publications emanating out of the thesis (MSc/PhD), the concerned student shall necessarily be the first author. However, it is equally important that deserving authors are not omitted. In case of controversy/dispute, the Director of the institute may, if necessary, constitute a Committee, with a set time frame (not exceeding 15 days) for resolving the issue.

1.3.2 It is advisable that the authorship is discussed between the members of research team at an early stage of execution of the project, and reviewed whenever there are changes in participation/contribution. In case where there is more than one author of an intended publication, all the authors should take responsibility for the integrity of the work and findings reported. However, one of them (not necessarily the Principal Investigator or Project Leader) should be nominated as corresponding author. The corresponding author shall assume overall responsibility for the manuscript and act as a point of contact between the PME Cell²/Editor and the other authors.

1.3.3 All those who have contributed to the study but in a manner that does not merit authorship should be duly acknowledged. Publications involving work done by a student enrolled with a University other than the ICAR institute must acknowledge that the work was carried out at the Institute. The sources of financial support for the project should also be duly disclosed and

²These are Prioritization, Monitoring and Evaluation (PME) Cells, being established in each ICAR Institute/Unit, and aim toward bringing proper and judicious allocation of research resources, based on priority, using analytical tools, and tracking the implementation and progress; and bringing in accountability, transparency and objectivity in the system. PME Cells must be fully integrated with research decision making at the Institute/Unit level, and need to be assimilated into project proposal formulation, evaluation and implementation. The idea is to ensure through a single window system in each Institute/Unit a continuous communication with all kinds of key stakeholders. A continuous commitment to PME in each Institute/Unit is considered absolutely necessary.

acknowledged. Courtesy demands that individuals and organizations providing facilities must also be acknowledged.

1.3.4 In cases when a student/scientist who is a corresponding author publishes her/his research paper from a location outside the country, it is her/his responsibility to ensure that (s)he informs the Head of Division/Regional Station or PME Cell by sending a copy of the manuscript.

1.4 Procedure for submitting manuscripts to research journals - To get clearance for each research publication, the procedure laid down below needs to be followed in all ICAR institutes.

1.4.1 The complete manuscript under the signature of corresponding author should be submitted to the PME Cell (through Head of the Division or Regional Station in large Institutes or deemed universities) in the proforma as placed at Annexure I. In case authors from outside the Institute are included, the corresponding author will also be responsible for her/his contribution, which too should be reflected in the proforma enclosed. If one of the researchers of the ICAR Institute is co-author in a publication from any other organization (other than ICAR), (s)he should inform the PME Cell in writing.

1.4.2 If required, the PME Cell (or Head of Division or Regional Station) should constitute a small committee of 2-3 scientists to check the veracity of research. Accordingly, the comments received, if any, shall be conveyed by the PME Cell (or Head of the Division or Regional Station) to the corresponding author for consideration within a period of 15 days.

1.4.3 The corresponding author should submit the revised/final manuscript to the intended national/international journal for publication endorsing a copy to the PME Cell.

1.4.4 In specific cases when a research paper is rejected from publication by any journal, it should be left to the discretion of the author to resubmit the manuscript to any other journal for publication after considering the comments of reviewer/editor. However, a copy of revised and submitted manuscript shall be endorsed to PME Cell as per regular practice.

1.4.5 The PME Cell shall maintain a record of all the manuscripts sent for publication by assigning a reference number with dates of receipt and clearance of the manuscript.

1.5 Divergence of views regarding merit of the research paper or undue delay in communicating approval

1.5.1 In cases where there is divergence of views regarding merit of the research paper, the concerned scientist/staff shall forward the paper for publication under her/his responsibility and making it explicit in the forwarding letter to the Editor of the intended journal that "*The Data/ Results/Schemes and ideas given in the papers are entirely the work of my/our research work and the Institute and ICAR are not responsible for any liability arising out of this publication*". A copy of the paper would, in any case, be endorsed/forwarded to PME Cell for record.

1.5.2 If there is undue delay in the Institute in offering comments on the received manuscript, but the scientist holds the view that the paper is worthy of early and timely publication, (s)he may forward the paper to the intended scientific journal as provided in point 1.5.1 above after a waiting period of 15 days after its receipt in the PME Cell.

1.6 Procedure for forwarding abstracts/full paper for national/international seminar/symposia/conference etc. - The abstract should be forwarded within 7 days by the Head of Division/Head of Research Station/Centre along with the proforma as placed at Annexure II. The full paper shall also be forwarded through the same Annexure II.

1.7 Publishing material of extension value - Publications of extension value or other literature for benefit of farmers, other users of information or the general public should be cleared by an appropriate mechanism developed in each Institute by itself. However, such publications should also be given a reference no. and recorded in the PME Cell; and a copy of such publication must also be kept for safe record in the Institute Library.

1.8 General

1.8.1 *Publication of books and booklets by the institutes, publications arising from work of scientists outside the mandate of the institute, popular articles etc.* - ICAR may have no objection provided the publication is permitted under the CCS (Conduct) Rules. However, prior intimation may be given to Director of the Institute, and copy submitted in the PME Cell.

1.8.2 *Page charges required for publication in scientific journals* - Page charges required for publication in certain journals should be provided in the cases of higher rated NAAS journals or journals having international impact factor. This can be done either from the budget head of “Non-Plan (others)”, or from the funds available in the case of externally funded projects. However, a decision to allow the page charges should emanate from a Committee constituted for this purpose.

Annexure-I

**Proforma to be submitted to PME Cell by author(s) for
forwarding research manuscript for publication
in research journals**

Date _____

To

Head of the Division/Regional Station/In-charge, PME Cell,

_____ Institute

Subject: Submission of Research Manuscript for publication in scientific journals

Sir,

I/we are/am enclosing herewith manuscript of an original scientific research article entitled “_____” with a request that permission may kindly be granted for submission of the same in the “_____” journal/national/international/other(to specify). I hereby certify that the information given for each of the items listed below is correct.

S.No.	Item
1.	The article/paper/manuscript is based on bona fide research and/or miscellaneous observations conducted in the Institute, and is related to mandated activities as per details below.
2.	Project title: Project Ref No.: Type of project: Institute project/Externally funded/Contract research/MSc/PhD research/ any other scheme
3.	Title/Topic/Name of the activity of the institute of which the publication is an output.
4.	The manuscript has been thoroughly checked by all the authors (including the authors from other organisations, if any) and are satisfied with its form and content.
5.	Due credit of authorship has been given to each contributor of the article.
6.	The sequence in which the authors' names appear has been decided by consensus.
7.	The article has not been submitted simultaneously for publication in any other journal.
8.	Due acknowledgement has been given to funding agencies or for assistance received from individuals/institutes/sponsoring agencies for carrying out this work.
9.	Care has been taken that the publication will not lead to premature disclosure in cases where filing of patent is envisaged.
10.	Data/Results/Schemes/Ideas given in the paper are entirely the outcome of my/our research work and the Institute and ICAR are not responsible for any liability arising out of this publication.
11.	Internal Citing: The required number of secondary sources has been cited parenthetically in the proper format; and credit is given each time that the information is used, even if it is paraphrased or summarized.

(Signature with name and designation of Corresponding Author)

(Signature of available Co-authors, if any)

Recommended and forwarded by the HoD/In-charge

(Signature of the HoD/In-charge)

Recommended and forwarded by the PME Cell In-charge

(Signature of the PME Cell In-Charge)

Approval of the Head of the Institute (Director/JD/PC/PD)

(Signature of the Head of the Institute)

PME Cell Reference No.

Annexure-II

Proforma to be submitted to PME Cell by author(s) for forwarding abstract/full paper for presentation to the national/international seminar/symposia/conference etc.

Date _____

To

Head of the Division/Regional Station/In-charge, PME Cell,

_____ Institute

Subject: Submission of abstract/full paper for presentation to the national/international seminar/symposia/conference etc.

Sir,

I/we are/am enclosing herewith an abstract/full paper entitled “ _____ ” with a request that the permission may kindly be granted for submission of the same in the “ _____ ” national/international seminar/symposia/conference/others (to specify).

S.No.	Item	Particulars
1.	Date/Location/Venue of the symposium/seminar/conference etc. to be organized	
2.	Dead line/last date of submission of abstract/full paper to the organizers	
3.	Name of the society/organization	
4.	Cost of travel/boarding & lodging/fee including registration fee borne by ICAR/Institute/organizer/sponsor/self	
5.	Whether care has been taken that the publication will not leave to premature disclosure in case filing of patent is envisaged	Yes/No
6.	Whether the issue of plagiarism has been taken care of	Yes/No
7.	Whether all minimum requirements including format, introduction, body, conclusion, works cited page, conventions' (grammar and spelling) etc. for submission of manuscript have been taken care of	Yes/No

I, Dr/Mr/Smt/Ms.....certify that: i) The data/results/schemes/ideas given in the abstract/paper is based entirely on the work of my/our research work and need not necessarily represent the views of the Institute/ICAR; and ii) Due credit of authorship has been given to each contributor of the abstract/paper.

(Signature with name and designation of Corresponding Author)

(Signature of available Co-authors, if any)

Recommended and forwarded by the HoD/In-charge

(Signature of the HoD/In-charge)

Recommended and forwarded by the PME Cell In-charge

(Signature of the PME Cell In-Charge)

Approval of the Head of the Institute (Director/JD/PC/PD)

(Signature of the Head of the Institute)

PME Cell Reference No.

Chapter 2

Research Data Management

2.1 Introduction

This chapter describes the guiding principles to be followed in ICAR Institutes for efficient data management and other issues related or incidental thereto.

2.2 Definition of Data

2.2.1 The conventional definition of data would include factual information (as measurements or statistics) used as a basis for recording, characterisation, reasoning, discussion or calculation. The Data for the purpose of these guidelines would include all those research products necessary to validate the integrity of published or reported work. It would, therefore, potentially consist of much more than just information and observations written in a lab notebook as part of scientific inquiry but also the materials, the means and the products of that inquiry (such as variety, technology, equipment developed, software, information system, etc.). Some indicative examples of types of data in ICAR institutes could include:

- Laboratory/field measurements and observations;
- Germplasm related information;
- Information on products such as vaccines, primers, bio-pesticides, equipments, software, source code for softwares/information systems, both data as well as material, etc.;
- Novel microbes or virus isolates of scientific/commercial importance;
- Technologies, processes, methodologies;
- Information related to surveys, sample survey data, bio-prospecting, know-how, etc.;
- Publications, photographs, audio-visual materials, databases, drawings, etc.;
- Information related to IPR applications, technology commercialisation etc.;
- Information of service functions (e.g. training, consultancy, contract research, contract service, infrastructure facilities, liaison, other facilitation/partnerships);
- Information/data on the compliance of guidelines and special regulations that apply to the project's implementation such as those involving exchange of genetic material, biosafety, handling of hazardous materials, etc.

2.2.2 It may be appreciated that the examples mentioned above are neither exhaustive nor mutually exclusive. There may be circumstances when many of them apply to a single project or activity. These guidelines are a comprehensive set of standards for effective management of data in the Institutes and are intended to increase awareness of maintaining data integrity; and outline ICAR's expectations for maintaining prescribed standards of work performance and ethical conduct expected of all persons engaged in research in ICAR institutes.

2.3 Data Ownership

2.3.1 All data collected/generated from research, educational or allied activities conducted at the Institute and using ICAR resources shall belong to ICAR, including data generated from student research work or by consultants hired by Institute/ICAR. This shall imply retaining the data after the project is completed and the right to transfer data to third parties. Exceptions may be subject to restrictions stipulated in Institute/ICAR-approved agreements for collaborative research, sponsored research, contract research or contractual services rendered to third parties. The PME Cell of the institute shall be the nodal unit in the institute to manage data from research activities under various projects. The Director of the institute shall be the Competent Authority to implement these guidelines and take appropriate decisions as per the guiding principles.

2.4 Data Collection and Recording

2.4.1 The PME Cell shall oversee that the data is collected in a consistent, systematic manner ensuring its reliability and establish a system that permits for periodic evaluation, monitoring and flexibility for recording changes.

2.4.2 A nodal person, depending upon the activity (refer definition of data above), should be given primary responsibility for data collation, proper attribution, recording, storage, retention, and disposal or transfer to the archives. In case of research projects, the Principal Investigator (PI) shall have the ultimate responsibility for integrity of the data, but considering the central importance of data to all research, that responsibility shall also extend to Co-Principal Investigators (Co-PIs) and associates who help in planning the study, collecting the data, analyzing or interpreting the research findings, writing or publishing the results of the study, or maintaining or sharing the research records.

2.4.3 Data collections should be done scrupulously and data records should be maintained in a durable and accessible medium/manner that ensures safety from tampering or manipulation. Data collection can be in different forms depending upon the activity/project and the best suitable model for record keeping shall have to be worked out on a case-to-case basis. For example, for crop improvement programmes, to ensure traceability of the material and developmental process of the genetic material for pedigree management, each line should be assigned a unique ID in a season. Likewise, relevant procedures may be developed for other types of data.

2.4.4 It is generally recommended that wherever it is feasible the data should be recorded in suitable electronic forms. All the data files should be so named that it clearly identifies the project, data collected etc. Accordingly, online data entry, verification and analysis should be given top most priority.

2.4.5 Notebooks/registers generally offer a convenient way for data recording and tracking daily progress by all team members. These should be supplemented as needed by specialized methods of record keeping suitable for specific types of data (e.g. computer files/images, photographs, gels/gelscans, chromatograms, etc.). While keeping written records, the accepted minimum standards should include:

- Notebooks/registers should be bound and accessioned (officially numbered and catalogued by the PME Cell/Institute and issued by name to the concerned person);
- Separate notebooks/registers should be maintained for each project;
- Each page of the notebooks/registers should be numbered;

- All entries should be dated, legible, clear, made in ink, and in a chronological and consistent manner (for instance, each new work day should begin on a new page);
- Leaving blank lines between entries should be avoided;
- Errors and deletions should be lined/marked, dated and initialled (and never erased out) in a manner that all entries remain readable and provide a quick visual account as to when and by whom the changes or errors have been corrected;
- Provide information to permit future verification of what was done by whom (appropriately initialled by the person making entry and verified by the supervisor);
- Any supporting materials or records should be properly catalogued and the reference to location(s) duly included in the notebook.

2.4.6 There are various electronic data capture programs that allow data entry, storage, analysis and need-based retrieval of information. Transferring of records from written to electronic format should either be done using double entry system or double checked manually to avoid any incorrect data entry. The PI or the Co-PIs should be responsible to cross-check the records, as well as identify and remedy any inconsistencies in data entry. Maintaining fidelity of data is a significant concern for electronic records, and proper checks have to be provided for protecting electronic records. In many cases, it may be difficult to migrate notebook data records to electronic files. In such cases, a combination of written and electronic record keeping should be followed balancing the risks and benefits. The mechanisms for development of online data management system (at Institute Level and/or at Central level) with the provision of value addition need to be taken up on priority. Adequate provisions need to be made both in terms of infrastructure and manpower for development, implementation and maintenance of such systems.

2.4.7 Upon completion of the project, it is important to maintain all original laboratory and field notebooks with PME Cell and a copy with the concerned section or laboratory.

2.4.8 There should be a complete switchover to electronic data recording by all the institutes by 31 December 2014. However, it is proposed that at least one Institute/AICRPs/NRC/All India Network Programme/Bureaus/Project Directorates in each Subject Matter Division should switchover to online data management by October 31, 2014. Additional support may be provided to the concerned Institute(s) to ensure that the deadlines are maintained.

2.5 Data Storage and Security

2.5.1 Data storage is important for making it accessible in future to researchers who wish to evaluate or augment the results of research carried out earlier. It is also necessary to establish precedence in the event, e.g., if similar research is published and/or there are issues related to IPR/legal claims that can emanate subsequently.

2.5.2 Adequate data security provisions should be made to protect data against physical damage, unauthorized use of the database or its application, unauthorized/accidental deletions; modification; disclosure, loss, theft, confidentiality and integrity breaches for data in data transport; and physical storage and disasters. Notebooks or data in other physical forms should be kept in a safe and secure location, preferably locked. Coded identifiers in place of names and other information may be used to ensure privacy and anonymity; the encoding key may be kept in a different secure location.

2.5.3 Similarly, protecting the electronic data could include: (a) protecting unauthorised access to data by using unique user IDs and passwords that cannot be easily guessed, avoiding frequent changing of passwords, providing access to data files through a centralized process, evaluating and limiting administrator access rights, ensuring no interception can be made from outside wireless

devices etc., (b) protecting the system by maintaining up-to-date versions of all software and media storage devices, keeping updated anti-virus/firewall protection, using intrusion detection software to monitor access etc., and (c) protecting data integrity by recording the original creation date and time for files, using encryption/electronic signatures to track authorship and changes made to data files, maintaining regular back up (both on and offsite) and creating both hard and soft copies as required, ensuring that data are properly secured. Electronic data should be backed-up and archived periodically and the backed-up files should be stored in PME Cell and/or Institute library.

2.5.4 Each data set should be properly documented. Some fields refer to data documentation by other terms, such as metadata or codebooks, information about the methodology and procedures used to collect the data, details about codes, definitions of variables; variable field locations, frequencies, and the like. Proper documentation is needed to ensure that others can use the dataset even after decades. One is able to decipher and use it as if (s)he had generated the data, and it is possible to prevent misuse, misinterpretation and confusion. The precise content of documentation will vary depending upon the scientific area, study design, the type of data collected, and characteristics of the data set to be decided on case-to-case basis. Different sets of standards may be evolved. The following guidelines may be helpful in forming these standards. A larger exercise should be undertaken to develop these standards across disciplines. Broadly, information can be documented in the following four Groups:

Group 1: Common for all data: Primarily identify type of information, project title in which data generated, author(s) {PI, Co-PIs etc.} responsible for generating, institute name (s), contact details along with affiliations, date generated, source of funding, etc.

Group 2: Subject Level details: Depending on the subject(s), the standards should be developed. For example, if the data is from an experiment pertaining to Soil Science, the standards may be soil type, previous crop grown, sowing date, irrigation schedules followed, field locations (preferably geo-referenced), etc. For general data, this level should be able to capture general information, such as broad area (related to Finance/Administration circulars); and cross-references to earlier data.

Group 3: Experimental/Survey data: Project level details, name of the project, project code, objectives, experiment/survey details, hypothesis under investigation, statistical design/survey design applied, previous experiment/benchmark survey reference, dates, actual data, unit, treatment unit details, details on codes if data is coded, type of transformation(s) used, if any on the variables, data is processed or raw, statistical techniques used for analysis performed, etc.

Group 4: Data not covered in any of the above three levels.

2.5.5 Creation of data repositories may be taken up in two different formats: (i) generate metadata (data about the type of data available, location of data availability and identification of the source) to enable data discovery and its exploration for the research and developmental activities at PME Cell (this would also be helpful in avoiding duplication/multiplication of data generation activities and also increase the reliability of data sets being used); and (ii) the centralized online research data repository along with standardization of analysis and reports may be taken up in a phased manner.

2.5.5.1 Efforts may also be made to enter the past data also, wherever feasible. The past data may not contain complete information, but efforts should be undertaken for preserving past data.

2.6 Data Access and Sharing

2.6.1 Whatever may be the recording medium, it is essential to maintain the privacy of data as required by confidentiality agreements and regulations while making it easily accessible to scientific supervisors and collaborators, as per confidentiality agreements. The PIs/Co-PIs or the nodal person should be authorized to permit access to the data to only eligible persons for legitimate

institute purposes or as per the requirements of legislations, such as the Right to Information Act. However, the authorization to access institutional data shall vary according to its sensitivity. The PME Cell may classify the data depending upon the levels of relative sensitivity. In view of National Data Sharing and Accessibility Policy, the data may be classified into open access, registered access and restricted access. All these data sets may also be classified into high value and low value categories. Some data sets should be identified for sharing on the National Data Sharing and Accessibility Portal. It shall also include specific restrictions for sharing the data as per policy. Sharing access level (e.g. to be shared only within ICAR institutes and what level, not to be shared with other agencies, free to share with other agencies, paid access, for non-commercial use, etc.) should be properly defined.

2.6.2 The access to and use of research data will be limited by restrictions for reasons viz. i) national security: data pertaining to intelligence or political decision making; ii) data pertaining to protection of germplasm resources, biological resources, protection of rare, threatened or endangered species; iii) trade secrets and intellectual property rights data on or from business or other parties that contain confidential information; iv) personal data subject to restricted access under laws of India and policies to protect confidentiality and privacy; v) data under consideration in legal actions (sub-judice); and vi) participant confidentiality concerns, third-party licensing or use agreements; etc.

2.6.3 In so far as research projects are concerned, data sharing should be encouraged through publication of results in a scientific journal or establishing IPR on a scientific product or process. Before publication, there is no obligation to share any preliminary data that have been collected. In fact, sharing at this stage needs to be discouraged because the inferences from such data may not be conclusive while a project is still in progress. Also, there may be concerns regarding appropriation of results by other researcher, and/or it may cause premature disclosure in case filing IPR application is considered. After the research data have been published/IP protected, the information related to the project should be considered open data and may be shared with other researchers as per restrictions defined in 2.6.1 and 2.6.2 and further using the guidelines in 2.6.4 and 2.6.5. It may, however, be noted that data should be available with the data repository decided by the Institute with adequate security mechanism.

2.6.4 Different cooling periods for different data sets may be identified. For example, the data of agro-meteorology, productivity, area under different crops, land usage patterns etc. may not have any cooling period. Raw experimental data may have a cooling period of three-four years, whereas mean data/analysed results may be shared after one year. The data/results required for obtaining IPRs may be shared after decision on the IPR application. Data should be either on website or as central data depository. The unpublished data generated in the projects and MSc/PhD thesis should be put in public domain only after three years of completion.

2.6.5 While sharing data across organizations, data sharing agreements should be signed to impose restrictions on the usage. Any individual/organization using the shared data should acknowledge the source of data used and upon which their manuscript is based. Information may be included in the methods and/or reference sections or in the acknowledgement section.

2.7 Data Retention

2.7.1 The research project data for end-to-end projects should be retained as a hard copy/digital form even after the funding period ends or the process of publication(s) or prosecution of IPR application(s) emanating from the study has been completed as defined in Section 2.6. Data retention can be for much more period in case of experiments which could have long term implications such as climate change, nutrient mapping etc. The minimum storage period can thus

be decided by the PME Cell in consultation with PI/nodal person. The primary data can be stored in the Unit/Centre/Station and not necessarily submitted to PME Cell. However, as a thumb rule, PME Cell should retain enough data necessary to reconstruct/evaluate the findings of a project with ease; it is not important to retain all the raw data that were collected. In case research involves supporting materials, such as the use of biological specimens, care should be taken to retain their quality during the storage period.

2.7.2 Due credit should be given to the earlier institutes/researchers who have contributed in the long-term research when publications are being made using the archived data.

2.7.3 In cases where individuals involved in research projects are transferred or leave the institutes due to resignation/superannuation, they may be permitted to take copies of research data for projects on which they have worked and which is essentially required for the purpose of research publication. The permission shall be granted subject to a written assurance that guarantees: a) acceptance of custodial responsibilities for the data, and b) access to the data for Institute/ICAR, should that become necessary. In any case, the original data must be retained at the Institute by the next PI taking over charge for the project or the PME Cell.

2.8 General Recommendations

2.8.1 AICRP automation system being developed for All India Sorghum Improvement Project under NAIP Consortium on Strengthening Statistical Computing for NARS is using the classification given in para 2.5.4. Some experimental data from on-farm and on-station experiments conducted under AICRP on IFS (Integrated Farming System) and AICRP on LTFE (Long Term Fertilizer Experiments) is being entered and/or analysed online at present. A web-enabled information system for field experiments is available at IASRI (Indian Agricultural Statistics Research Institute) website. This is at present only for field experiments. Therefore, to cater to the needs of all research data in the Council, subject area specific modifications and customization would require adequate infrastructure in terms of high end servers, internet connectivity, storage area network, trained/skilled manpower and other resources. Further, it would be required to include statistical data analysis and value addition component along with creation of research data repository. This may be taken up as one mega-project in the institutes' programmes. To begin with, one or two AICRPs/ Network Projects from each SMD may be taken up for the purpose; and which then may be up-scaled for all AICRPs in a phased manner.

2.8.2 A new project may be taken up to achieve the recommendations so that, by the end of current plan period, online research data repositories can be created across ICAR Institutes. IASRI, New Delhi will be the lead coordinator for this project.

Appendix I

**INDIAN COUNCIL OF AGRICULTURAL RESEARCH
KRISHI BHAVAN: NEW DELHI**

F. No. 10(1)/12-Per. IV

Dated: 28th August, 2012**OFFICE ORDER**

It has been decided with the approval of the Director General, ICAR to constitute a Committee of the following officers to look into the issue of forwarding of Research papers to scientific journals by Scientists in the ICAR with a view to formulating uniform guidelines on the subject:-

- | | |
|---|----------------------------------|
| 1. Dr. A.K. Singh, DDG (NRM) | – Chairman |
| 2. Dr. H.S. Gupta, Director, IARI | – Member |
| 3. Dr. S.K. Datta, DDG (CS) | – Member |
| 4. Dr. (Mrs.) B. Meena Kumari, DDG (Fy.) | – Member |
| 5. Dr. N.K. Krishna Kumar, DDG (Horticulture) | – Member |
| 6. Dr. N.K. Singh, National Professor | – Member |
| 7. Dr. B.S. Prakash, ADG (AN&P) | – Member |
| 8. Dr. M. M. Roy, Director, CAZRI | – Member |
| 9. Dr. S. Mauria, ADG (IP&TM) | – Member Secretary & facilitator |

The terms of reference to the Committee shall be as under:-

1. To formulate guidelines for internal evaluation and forwardal of research papers to scientific journals by the Institutes arising from the work of the scientists under Institute based Projects, externally funded Projects, collaborative Projects, students' guidance, etc.
2. To formulate guidelines for data management at the ICAR Institutes.
3. To formulate guidelines for publication of books and booklets by the Institutes, publications arising from work of scientists outside the mandate of the Institutes, popular articles, etc.
4. Any other issue related or incidental thereto.

The Committee may submit its report within 3 months from the date of issue of this Office Order.

Yours faithfully,
Sd/-
(V.K. Sharma)
Under Secretary (Per. IV)

Distribution:-

1. All members of the Committee (by name)
2. PSO to DG, ICAR
3. Sr. PPS to Secretary, ICAR
4. Director (P)/Director (F)
5. PD, DIPA for placing the Office Order on the ICAR website
6. Guard File

*Appendix II***INDIAN COUNCIL OF AGRICULTURAL RESEARCH
KRISHI BHAVAN: NEW DELHI**

No. 10-11/77-Per. IV

Dated the 9th November, 1977,

To

The Directors/Project Director of All the
Research Institutes.

Subject:- Forwarding Research papers to Scientific Journals.

Sir,

The question of formulating certain guidelines with a view to ensuring that in Research Institutes, there is full freedom for Scientists to publish their research findings in scientific journals, has been under the consideration of the Council for some time past. This matter had also been discussed at the Directors Conference. The consensus view was that if the Head of the Division or the Director does not give his constructive comments within a fixed period of time, the individual scientist could be authorized to forward his/her Research paper to a Scientific Journal. The onus for assessing the suitability of the Paper for publication will vest in the Editor of the Journal. The full responsibility of the paper will rest with the author(s).

2. In order to eliminate any ambiguity in this regard, the following guidelines are laid down with the approval of the Governing Body and President, ICAR:-

- (i) All research workers will be encouraged to write up the results of their research work in good scientific journals.
- (ii) For this purpose, the research worker(s) would be required to submit the manuscript of his/her/their research paper(s) to the Director of the Institute or Head of Division in which he/she/they are working, seeking his clearance.
- (iii) The manuscript of scientific papers should be cleared by the Head of Division in large Institutes (Indian Agricultural Research Institute, Indian Veterinary Research Institute and National Dairy Research Institute) and Directors in the other Institutes positively within a month from the date of submission of the manuscript by the Scientist.
- (iv) All Directors (and Heads of Divisions, Indian Agricultural Research Institute, Indian Veterinary Research Institute and National Dairy Research Institute) shall maintain a Register specifically for keeping a record of the such manuscripts cleared (with dates of receipt and clearance of the manuscript).
- (v) While communicating the clearance of the manuscript, the Official No. in accordance with the Register mentioned at (iii) above shall be recorded on the approved copy of the manuscript as
(Paper No. _____ from _____ (Name of Institute/Divisions).
- (vi) Where the Head of a Division/Director considers that the paper does not merit publication, but the individual scientist does not agree with that view or where there is undue delay in

offering comments, the scientist concerned could forward the paper for publication on his/her responsibility making it explicit in the forwarding letter to the Editor of the Journal that the Institute does not hold responsibility for the opinions expressed therein. A copy of the paper should be endorsed to the Head of the Division/Director.

(vii) If any paper had been withheld in the past by the Director/Head for any reason but the scientist still holds the view that the paper is worthy of publication, he/she may forward the paper to a scientific journal as provided under guideline (vi).

3. Wide publicity may kindly be given to these guidelines in your Institute. These guidelines apply only to research papers and not to material of extension value. Papers giving advice to farmers/fishermen/public should be cleared by the appropriate screening committee set up by the Institute for this purpose so as to ensure that only well-tested and economically proven results are passed on to farmers/fishermen.

Your faithfully,
Sd/-
(M.S. Swaminathan)
DIRECTOR GENERAL

Copy forwarded to:-

1. All DDGs, ICAR.
2. All ADGs, ICAR.
3. All Officers of the Headquarters in the Council.
4. Chairman, Agricultural Scientists Recruitment Board, 1205, Nirmal Tower, 26-Barakhamba Road, New Delhi.

Sd/-
for Director General

