

**ICAR Guidelines for
Intellectual Property Management and
Technology Transfer/ Commercialization**



**Indian Council of Agricultural Research
Krishi Bhawan, New Delhi
2006**

October, 2006

Publication based on Report of the Committee to Develop Guidelines for Intellectual Property Management and Commercialization of Technologies in the ICAR System.

Citation

ICAR. 2006. ICAR Guidelines for Intellectual Property Management and Technology Transfer/ Commercialization. Indian Council of Agricultural Research, New Delhi.

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Published by Kuldip Sharma, In-charge, Directorate of Information and Publications of Agriculture (DIPA),
Krishi Anusandhan Bhawan - I, Pusa Campus, New Delhi – 110012 on behalf of Director General, Indian
Council of agricultural Research, Krishi Bhawan, New Delhi - 110001 and printed by him at the
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FOREWORD

The Indian Council of Agricultural Research (ICAR) recognizes the need of becoming competitive in the intellectual property rights (IPR) regime so that we can ultimately bring the Indian farmers away from subsistence with the transfer of our IPR enabled technologies through commercial, cooperative and public routes. In the early 1990s, ICAR had taken initial steps for the pro-active management of IPRs generated by our scientists. This was in line with the upcoming global developments on trade and IPR but also within the limited scope of our Patents Act. At that time, neither the products in the areas of food and agrochemicals nor the methods of agriculture and horticulture were patentable subjects. Also, there was no national legislation on the plant variety protection in place. Hence, an obviously slow progress of IPR titles for ICAR is discernible. However, as a follow up of the World Trade Organization (WTO) Agreements, the legislative scenario concerning IPRs changed fast and by 2005 the country had revised or enacted various IPR laws to meet the national requirements vis-à-vis the Agreement on Trade Related Aspects of Intellectual Property. These developments have also opened new challenges before the public research and education system in agriculture and other areas to become contemporary, compatible and competitive.

Our internal policy and institutional support in the early phase was mainly guided by the ICAR Rules and Bye-laws and the Rules and Guidelines based on the Johl Committee Report. A case-by-case approach guided the protection of IPRs and transfer of IPR enabled technologies by ICAR. However, it was felt appropriate to elaborate upon the IPR policy framework and working guidelines for the management of technologies in the set up with the help of a committee of administrators, professionals and law experts. The outcome is expected to create IPR awareness and literacy, enhance the work environment for higher innovativeness, ensure that the scientists/innovators are duly rewarded with their share of benefits accrued, and guide the manner of technology transfer which would be competitive and better serve the interests of agriculture and farmers. A win-win situation for all partners/ players/ stakeholders/ beneficiaries would indeed be helpful.

Dr. Rita Sharma Additional Secretary and Financial Advisor, Chairperson of the Committee has ably guided the preparation of these guidelines. The excellent final product is indeed the outcome of her leadership, her application and ability to extract the essence of this very important exercise through a team effort. In this endeavor, she was ably supported by Dr. Sudhir Kochhar, Principal Scientist and Member Secretary of the Committee having distinguished membership. I am happy that the framework of IPR policy and the elaborate guidelines for operationalization as approved by the Governing Body of the ICAR Society in its meeting held on 19th September, 2006 would provide end-to-end approach and procedures in this volume for the management of intellectual properties in agricultural research. These guidelines, I am hopeful, would be relevant to all concerned and worthy at least to begin with in the new era of IPR regime in ICAR. The guideline has all the potential and enabling provisions to be adapted by other partners of National Agricultural Research System.

New Delhi
Dated The 28th September 2006


(MANGALA RAI)
Secretary, Department of Agricultural Research & Education and
Director General, Indian Council of Agricultural Research,
Ministry of Agriculture, Krishi Bhawan,
New Delhi – 110001.

Preface

India as a member of the World Trade Organization (WTO) is obliged to comply with the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement). This requires that member countries provide for intellectual property rights (IPRs) in one form or the other in all fields of technology, including agriculture. ICAR recognizes that research in frontier sciences, such as agro-biotechnology will require intellectual property (IP) protection through patents, plant variety protection and other forms of IPR. Public-private partnerships will play an increasing role in the advancement of agricultural research under the IPR regime. The transfer of IPR enabled agricultural technologies through commercial route will gain greater importance in the future. In response to the changing scenario of technology generation and dissemination, the Secretary, Department of Agriculture Research & Education (DARE) and Director General, ICAR constituted a committee to develop a policy framework and guidelines that would lead to the systematic management of the Intellectual Property created by the ICAR scientists.

IPRs are important not only because India as a member is required to accede to the conditions of an international agreement but also because they offer possible mechanisms for stimulating research, enabling access to technology and promoting enterprise growth, all for the ultimate benefit of the farming community. One of the objectives of IP management is to protect the intellectual wealth generated in the ICAR. In today's context it has become necessary to do so, for unprotected research results in the public domain can lead to unacknowledged use/ exploitation of such research for commercial gains by other agencies both within the country and abroad. Moreover, protection of IP creates incentive for more knowledge and technology generation as scientists/ innovators are recognized and rewarded. Although income generation is not the primary motive for IP protection in ICAR, since only a handful of patents earn significant revenues, nevertheless, resources generated through commercialization of technologies would be useful for important gap filling requirements for research and development purposes. It is expected that the new IP management and technology transfer/ commercialization regime will lead to a change in mindsets of the ICAR community in conformity with the thinking at the national and international levels. It is also expected that in due course the NARS partners of ICAR, especially the State Agricultural Universities will also develop IP management regimes.

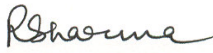
This document underwent several stages in its preparation to make the final product comprehensive and user-friendly. The committee undertook a detailed review of the in-house processes that were being discussed and debated as 'management of change' for quite sometime. We drew valuable lessons from the IP guidelines of other institutions, namely, Indian Institutes of Technology, Indian Institute of Science, University Grants Commission, Indian Council of Medical Research, Council of Scientific and Industrial Research, Department of Science and Technology, etc. in India and of several universities from abroad. We benefited from the series of discussions both formal and informal from various experts and practitioners of IP management. The draft guidelines were also placed on the ICAR website to elicit more universal response and suggestions. A series of meetings were held with the Director General and the senior officers of the ICAR to further refine the document. The Governing Body (GB) of the ICAR approved the guidelines in their special meeting on 19 September, 2006.

Dr. Mangala Rai, Director General, provided the vision and direction for this major paradigm shift in the working ethos of the ICAR. His leadership and guidance was the main force behind this exercise. We are deeply grateful to him. We thank the Secretary ICAR, all the Deputy Director Generals, the National Director, National Agriculture Innovation Project, the Assistant Director Generals, the Directors and other senior officers of the ICAR who made valuable contributions to the development of these guidelines. We gratefully acknowledge the contribution of all the committee members, their representatives who attended various meetings of the committee, the co-opted members, and the drafting committee members -- Drs. M.Dadlani, S.Mauria, R.K.Mittal, Suresh Pal, S.K.Pareek, N.H.Rao and Shri Rajiv Maheshwari. Our special thanks to Professor V.S. Rekhi, former Director, National Law Institute University, Bhopal for providing legal insights and to Dr. Vijayraghavan, Director, Sathguru Foundation for sharing his international experience on the subject. We appreciate all the others who enriched the draft with their comments and suggestions. Thanks are due to the Director of the National Centre of Agricultural Policy Research (NCAP) who was so forthcoming with the logistic support.

These guidelines would not have seen the light of day without sincere efforts of Dr. Sudhir Kochhar, Principal Scientist (Plant Breeding/IPR) and Member-Secretary of the Committee. The assistance in sifting through umpteen documents and revising numerous drafts by him were instrumental in fine-tuning the text. More importantly, he has brought to bear major value addition to this exercise through his own expertise on the subject and his penetrating insights. Our sincere thanks are due to him.

Finally, it is worth reiterating that the purpose of IPR regimes in agriculture is to provide appropriate incentives for science and commerce to better serve the nation's farmers. The development of the guidelines is a step in that direction. We hope, that in no small measure these guidelines will achieve their objective.

New Delhi
Dated The 28th September 2006


(RITA SHARMA)
Additional Secretary, DARE & Financial Advisor
and Chairperson of the Committee

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F.No. 14-01/2006-IPR/Policy Plng.
Dated the 27th September, 2006

To

The Directors of all ICAR Institutes/Bureaux/Project Directorates/NRCs.

Sir,

In pursuance to the recommendation of ICAR Reorganization Committee, 2005 (Dr. Mashelkar Committee), a Committee was set up with FA, DARE in chair to develop guidelines for Intellectual Property Management and Technology Transfer/Commercialization. The Governing Body has approved the guidelines with certain modifications in its meeting held on September 19, 2006. The guidelines have been revised accordingly and a copy is forwarded herewith. It has been decided that these guidelines will become operative with effect from October 2, 2006.

This issues with the approval of DG, ICAR.

Yours faithfully,

(S. Mauria)

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Acronyms

ADG	Assistant Director General
AICRP	All India Coordinated Research Project
ASEAN	Association of South East Asian Nations
ATMC	Agro-Technology Management Centre at ICAR headquarters
BPD	Business Planning and Development (a component of the National Agricultural Innovation Project – NAIP)
CBD	Convention on Biological Diversity
CD-ROM	Compact Disk-Read Only Memory
CDs	Compact Disks
CG	The International Agricultural Research Centres of CGIAR
Institutions	
CGIAR	Consultative Group on International Agricultural Research
CIFE	Central Institute of Fisheries Education
CIFT	Central Institute of Fisheries Technology
CII	Confederation of Indian Industries
CSIR	Council of Scientific and Industrial Research
CTMC	Central Technology Management Committee (Short form of Central IP Management and Technology Transfer/Commercialization Committee, i.e. CIPM&TCC)
DAC	Department of Agriculture and Cooperation
DARE	Department of Agricultural Research and Education
DBT	Department of Biotechnology
DDG	Deputy Director General
DG	Director General
DIPP	Department of Industrial Policy and Promotion
DNA	Deoxyribose Nucleic Acid
DOR	Directorate of Oilseed Research
DRDO	Defence Research and Development Organization
DST	Department of Science and Technology
DU	Deemed University
DUS	Distinctness, Uniformity, Stability (essential criteria for protection of a new plant variety)
EDV	Essentially Derived Variety
EOL	Extra Ordinary Leave
FAO	Food and Agricultural Organization
FAQs	Frequently Asked Questions
FICCI	Federation of Indian Chamber of Commerce and Industries
GATT	General Agreement on Tariffs and Trade
GB	Governing Body (of ICAR)
GI	Geographical Indications
GMO	Genetically Modified Organism
GOI	Government of India
GPA	Global Plan of Action
GURT	Genetic Use Restriction Technology
HOD	Head of the Department
HRD	Human Resource Development
IARI	Indian Agricultural Research Institute
IC	Integrated Circuit
ICAR	Indian Council of Agricultural Research
IDA	International Depositary Authority

ILI	Indian Law Institute
ILRI	Indian Lac Research Institute
IMCs	Institute Management Committees (of ICAR institutions)
IMTECH	Institute of Microbial Technology
IP	Intellectual Property(ies)
IPAC	Intellectual Property Advisory Committee in Agricultural Research
IPR	Intellectual Property Right(s)
IT	Information Technology
ITMC	Institute Technology Management Committee (Short form of Institute Intellectual Property Management and Technology Transfer/ Commercialization Committee, i.e. IIPM&TCC)
ITMU	Institute Technology Management Unit (Short form of Intellectual Property Management and Technology Transfer Unit at an ICAR Institution, i.e. IPM&TTU)
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IVRI	Indian Veterinary Research Institute
JIPMP	Joint Intellectual Property Management Plan (in collaborative research)
KVK	Krishi Vigyan Kendra(s)
M.Sc.	Masters of Science
MIS	Management and Information Services
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MTA	Material Transfer Agreement
NAARM	National Academy of Agricultural Research Management
NAAS	National Academy of Agricultural Sciences
NAIP	National Agricultural Innovation Project
NARS	National Agricultural Research System
NASC	National Agricultural Science Complex
NATP	National Agricultural Technology Project
NBAGR	National Bureau of Animal Genetic Resources
NBFGR	National Bureau of Fish Genetic Resources
NBPGR	National Bureau of Plant Genetic Resources
NCAP	National Centre for Agricultural Economics and Policy Research
NCT	National Capital Territory (of Delhi)
NDRI	National Dairy Research Institute
NGO	Non-Governmental Organization(s)
NRDC	National Research Development Corporation
NRI	Non-Resident Indian
NLSIU	National Law School of India University
NSTEB	National Science and Technology Entrepreneurship Board
OSD	Officer on Special Duty
PB	Plant Breeding
PBR	Plant Breeders' Right(s)
PC	Project Coordinator
PCT	Patent Cooperation Treaty
PD	Project Director
PG	Post Graduate
PGRFA	Plant Genetic Resources for Food and Agriculture
Ph.D.	Doctorate of Philosophy
PI	Principal Investigator
PPV&FR Act	Protection of Plant Varieties and Farmers' Rights Act

PVP	Plant Variety Protection
R&D	Research and Development
RPF	Research Project File
SAARC	South Asian Association of Regional Countries
SAU	State Agricultural University(ies)
SMD	Subject Matter Division
SRCs	Scientific/Staff Research Councils
TIFAC	Technology Information Forecasting and Assessment Council
TK	Traditional Knowledge
TM	Trade Mark
TRIPS Agreement	Agreement on Trade-Related Aspects of Intellectual Property Rights
UN	United Nations
UNDP	United Nations Development Programme
UPOV	Union for the Protection of New Varieties of Plants
USA	United States of America
VB	Visual Basic
VCU	Value for Cultivation and Use
WIPO	World Intellectual Property Organization
WTO	World Trade Organization
ZTMC	Zonal Agro-Technology Management Centre (Short form of Zonal Intellectual Property Management & Technology Transfer/Commercialization Centre, i.e. ZIPM&TTC)
ZITMC	Zonal Institute Technology Management Committee (Short form of Zonal Institute Intellectual Property Management and Technology Transfer Committee, i.e. ZIIPM&TCC)

Chapter 1

Policy Framework for Intellectual Property Management and Technology Transfer/ Commercialization

1.1 Introduction

1.1.1 The Indian Council of Agricultural Research (ICAR)¹ is the apex body for planning, promoting, coordinating and undertaking research and its application in agriculture and allied sciences in the country. It is funded by Government of India (GOI) through the Department of Agricultural Research and Education (DARE) in the Ministry of Agriculture. It is the nodal agency of the National Agricultural Research System (NARS) comprising Central and State Agricultural Universities, Central Universities and affiliated colleges of agriculture, and other organizations -- public and private, national and international -- dealing with agricultural research. ICAR envisions harnessing science through generation, refinement and assessment of appropriate technologies that will ensure comprehensive sustained physical, economic and ecological access to food, nutrition and livelihood security for all².

1.1.2 India as a member of the World Trade Organization (WTO) is obliged to comply with the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement), which requires since 1 January 1995 that member countries provide for intellectual property rights (IPR) in one form or the other in all fields of technology, including agriculture. ICAR recognizes that research in frontier sciences, such as agro-biotechnology will require intellectual property (IP) protection through patents, plant variety protection and other forms of IPR. Public-private partnerships will play an increasing role in the advancement of agricultural research under the IPR regime. The transfer of IPR enabled agricultural technologies through commercial route will gain greater importance. In response to the changing scenario of technology generation and dissemination, ICAR has developed a policy framework that will guide the management of IP created by its scientists/innovators at its institutions or elsewhere, and that developed with its support. The policy framework could also apply to the Central Agricultural University³ (CAU), which is also funded by GOI through DARE.

1.1.3 In the past, ICAR pursued its IPR endeavors on a case-to-case basis. Accordingly, several of its policy elements framed herein have been derived from relevant actions/decisions taken in the ICAR from time to time. Moreover, the ICAR Rules and Guidelines for Training, Consultancy, Contract Research and Contract Services, 1997⁴, the Rules and Bye-laws of the ICAR Society, 2000, and the ICAR Guidelines for Filing Patent Applications,

¹ Indian Council of Agricultural Research (ICAR), Krishi Bhawan, 1, Dr. Rajendra Prasad Road, New Delhi – 110 001, established in 1929, is a Registered Society, incorporated under the Societies Registration Act, 1860. Currently ICAR organization consists of a network of institutions comprising 47 national institutes including 4 deemed to be universities and an academy of agricultural research management, 5 national bureaus, 12 project directorates, 31 national research centres, 91 All India Coordinated Research/Network Projects and 538 *Krishi Vigyan Kendras* (Farm Science Centres).

² Source: ICAR Vision 2020

³ Central Agricultural University, Imphal was established under The Central Agricultural University Act, 1992 (40 of 1992) on 26 January 1993. The state agricultural universities and agricultural colleges which form part of NARS also need to manage their intellectual assets. These institutions in order to meet their own requirements, may adapt the ICAR guidelines, as appropriate.

⁴ Based on the Johl Committee Report, 1997

2001 as amended in 2003 have been used to cull out some of the elements of the IP policy framework.

1.2 ICAR Intellectual Property Regime

1.2.1 The technological assets of ICAR include a number of high yielding and resilient crop varieties, animal and poultry breeds and fish strains, packages of improved crop and animal husbandry practices, natural resource management technologies, improved tools, equipment and farm machinery, improved dairy, poultry and fisheries technologies, post harvest technology, computer software and data sets, and several other processes and products of agriculture and the allied sectors. Agricultural science has been the engine of growth and led to quantum jumps in productivity in the past. Application of ICAR technologies in farmers' fields and backyards has increased agricultural output and farm incomes. These technology packages have been the major contributors to the green, white and blue revolutions that brought out spectacular gains in Indian agriculture. It is clear that the NARS must continue to produce significant research output to enable further enhancement of agricultural productivity and help meet the future needs.

1.2.2 Protecting or patenting research output in agriculture was not customary in India and other developing countries prior to the establishment of WTO in 1995. Scarcely any of the ICAR technologies were patented or commercialized. The prevailing ethos was to place technologies in the public domain for access by all. The TRIPS Agreement has led to the evolution of IPR regimes in WTO member countries. The Indian IPR laws are also made TRIPS compliant. ICAR recognizes that TRIPS compatible IPR laws in India and in other member countries are important for management of agricultural research results. Once protected, these IPR enabled ICAR technologies, by way of licensing, could be transferred to end users through private, cooperative, non governmental and public channels. Licensing could be for commercial use or for research or both. Application of incentives and benefit sharing with scientists/innovators and human resource development in ICAR would improve the overall research environment and provide impetus for greater creativity and knowledge generation.

1.2.3 This document comprises the IPR policy framework of the ICAR and the guidelines for IP management and technology transfer/commercialization. The management approach as described in the guidelines will conform to the national IPR laws and policies in force in the country. It will be in line with the legal framework required as per the TRIPS Agreement. The provisions of the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) will be recognized. Review/ reassessment, revision and/or harmonization of the guidelines with the related national laws and international agreements/ conventions/ treaties/ undertakings/ protocols will be undertaken from time to time so that the system remains contemporary and up-to-date.

1.3 Importance of Intellectual Property Management

1.3.1 An effective IP management regime would have in-built incentive for scientists/innovators to engage in knowledge creation. This would lead to greater professional recognition for them. Through licensing fees and royalties a proportion of the monetary gains would flow to the researchers. By sharing of monetary incentives with its staff and institutions, ICAR will encourage greater creativity in the research system. This is likely to lead to further innovations thus resulting in faster technological progress.

1.3.2 Commercialization of IPR enabled technologies and other know-how, through public-private partnership would lead to their accelerated and efficient transfer. Improvement in the rate of adoption of technologies by producers will in turn lead to increase in productivity, production, farmers' incomes and employment. The process of technology transfer through commercialization will be rational and selective. Key considerations would be (i) national priorities relating to food security, (ii) sustainable use of natural resources, (iii) enhancing the incomes of small and marginal farmers, and (iv) employment generation.

1.3.3 Protection of public sector research can be used as defence mechanism to keep innovations in the public domain. IPR enabled ICAR technologies could be utilized to negotiate/ bargain access to strategic research tools and technology from the private sector.

1.3.4 Income generation will not be the primary motive for IP protection in ICAR, since only a handful of patents earn significant revenues. Nevertheless, resources generated through commercialization of technologies would be useful for important gap filling requirements for research and development purposes.

1.4 Management of Intellectual Properties

1.4.1 The IP rights accruing to ICAR in various forms would be embodied in the following Indian Acts, as amended from time to time⁵.

1. The Copyright Act, 1957 as amended in 1983, 1984, 1992, 1994 and 1999 along with Rules 1958 and the International Copyright Order, 1999, 2000 (Copyright Act)
2. The Patents Act, 1970 as amended in 1999, 2002, 2004 (Ordinance), 2005 and 2006 along with Rules 2005 (Patents Act)
3. The Trade Marks Act, 1999 along with Rules 1999 (Trade Marks Act)
4. The Designs Act, 2000 along with Rules 2001 (Designs Act)
5. The Geographical Indications of Goods (Registration and Protection) Act, 1999 along with Rules 2002 (GI Act)
6. The Semiconductor Integrated Circuits Layout-Design Act, 2000 along with Rules 2001 (IC Layout-Design Act)
7. The Protection of Plant Varieties and Farmers' Rights Act, 2001 along with Rules 2003 (PPV&FR Act)

1.4.2 The Biological Diversity Act, 2002 along with Rules 2004 (Biodiversity Act) specifies procedures for access to biological/genetic materials for agricultural research and their IPR protection.

1.4.3 Of the various IPRs covered under the respective IPR Acts, ICAR will have most common recourse to patents, protection of plant varieties, and copyright. Protection of undisclosed information (trade secrets) will be through entering into suitable confidentiality agreements on case-to-case basis. Under the Patents Act, methods of agriculture and horticulture did not constitute patentable subject, which is still the case; however, inventive processes and products in all fields of technology, including agriculture and the allied are patentable in India except for the provisions made under section 3⁶ of the Patents Act.

⁵ The latest known amendments in various IPR related Acts and Rules are given. However, interpretation of these guidelines should not be limited to anyone of these versions alone. Rather, the latest amendment in the respective Act/Rules that has been notified and made effective at any point of time should be followed.

⁶ Explained in Chapter 3 (Footnote) and Chapter 5.

1.4.4 The PPV&FR Act is in harmony with the provisions of the Article 27.3(b)⁷ of the TRIPS Agreement. All extant varieties of ICAR that were notified under section 5 of the Seeds Act, 1966 that have not completed 15 years from their notification date are registerable and can be protected as IP under the PPV&FR Act.

1.4.5 Copyright, whether registered or not, will exist in all creations of ICAR scientists/innovators and its institutional works. However, registration of copyright of the concerned works of ICAR, particularly the new software and databases, etc. can be more effective. Trademarks and collective marks and industrial designs will also be important to ICAR. Geographical indications (GIs) are indirectly important in broader contexts rather than being of direct consequence to ICAR research. The layout designs for integrated circuits (ICs) could also be of interest albeit in few disciplines of agricultural research.

1.4.6 National Authorities have been established under the PPV&FR Act and the Biodiversity Act. These bodies are responsible for certain actions and duties as prescribed in the Acts. ICAR recognizes and respects the domain boundaries of the above mentioned statutory bodies and will take care not to impinge in their sphere of work. It will, however, if required, contribute to inter-departmental assessment of scenarios, technical fact-finding and provision of scientific advice and technical backstopping in the interest of farmers and Indian agriculture. In cases of IPs such as geographical indications of goods, ICAR will appropriately play in public interest facilitation and advisory roles.

1.4.7 ICAR will manage its IPR portfolio and technology transfers as per the prevailing national IPR and other related laws/rules. Its scientists and institutions will act in conformity with the key elements of its IPR policy framework and general guidelines for IP management and technology transfer/commercialization. However, in emergent situations or where there appears to be ambiguity and further clarification is required, the competent authority at the ICAR headquarters may be approached for case-specific decisions.

1.5 Key Elements of Policy Framework for IP Management & Technology Transfer/Commercialization

1.5.1 ICAR will secure IPR protection as per the Indian law and in conformity with the international agreements to which India is a signatory. It will promote transfer of its IPR enabled technologies, including finished processes, products, creations/works and other know-how, through commercial and public routes to farmers. Systematic management of its IPR regime will promote a commercial ethos in public sector research helping to transform agriculture from a predominantly subsistence mode to a globally competitive one.

1.5.2 **IP Ownership.** Ownership of IP generated in ICAR or caused to be generated by ICAR shall vest in the ICAR⁸. It will be either the sole owner or a joint owner of an IP depending upon mutually agreed terms that would be set out prior to the generation of that IP along with other collaborators/partners. Individual scientists/staff of ICAR responsible for the creation of its IP shall be recognized as the True and First Inventors/Innovators.

⁷ According to TRIPS Agreement Art. 27.3(b), "Members may also exclude from patentability: plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof..."

⁸ However, ownership of copyright on the literary and scientific creations by ICAR scientists and other staff published by them as per CCS (Conduct) Rules shall respectively vest in them.

1.5.3 IP Protection. Protection of all IPs generated in ICAR that are protectable and worth protecting will be sought in the first place in India as per the respective IPR laws. Where national IPR laws do not have enabling provisions to safeguard a strategic or commercial interest in an IP, but laws outside the country provide for this and the market prospects are favorable, ICAR may seek IPR protection in those respective countries. ICAR shall selectively secure protection of its specific IP abroad on the merits of each case based on strategic or commercial interest to India as well as the research and development interests. For seeking protection of its IP abroad ICAR will use the appropriate multilateral fora of which India is a member, e.g., the Patent Cooperation Treaty (PCT). Where such a multilateral platform is not available, the bilateral route will be followed⁹.

1.5.4 Harmonization. ICAR will closely monitor the evolution of IPRs at the national and international levels and act accordingly. Its IP management approach will be in harmony with developments in the national legislations and the relevant international agreements, conventions/ protocols, and treaties/undertakings concerning IPR. ICAR will amend its policy framework and guidelines from time to time to continue to remain compatible.

1.5.5 Technology Transfer by ICAR. ICAR shall transfer its IPR enabled and other technologies under the new regime in conformity with national priorities. Case-specific decisions will be taken regarding which technologies will be placed in public domain for open access and which others will be commercialized through non-exclusive or exclusive licences. All decisions on the mode of technology transfer will be preceded by the filing and recording of applications for protection of its IP.

1.5.6 Patenting versus Publishing. ICAR scientists/innovators may publish such research results of academic or public significance as do not impinge upon ICAR's interests in the protection of IP. They will not reveal inventive steps, if applicable, in such publications. They shall defer any publication of inventive steps/potential IP with commercial or strategic implications until an application for their IPR protection has been filed and recorded.

1.5.7 Public Domain Knowledge. Wherever ICAR decides not to apply for IPR protection, efforts will be made to quickly publish the research results and thereby bring the information/knowledge into public domain. This will also be done through digitalization of the publications creating widely accessible¹⁰ prior art so that any unacknowledged use of the public domain information generated in ICAR is forestalled.

1.5.8 Registration and Documentation for Animal/Fish Genetic Resources. Protection and facilitated access to plant varieties and plant germplasm is granted under the PPV&FR Act and the Biodiversity Act. The ICAR has a system in place for plant germplasm registration and documentation at its National Bureau of Plant Genetic Resources (NBPGR) for long, much before the aforementioned legislations came into force. For elite animal/fish genetic material in the public domain, however, there is no IPR enabling provision under the existing Indian laws nor is there any provision for the registration and documentation of the animal breeds and strains of fish developed by ICAR. To pre-empt any unforeseen grant of patents on animals/fish, including the improved breeds/strains from India, ICAR shall

⁹ In case of plant varieties, where the Union for Protection of New Varieties of Plants (UPOV) provides for a multilateral mechanism for their protection in the countries party to it, India is presently not a member.

¹⁰ Published on the Internet or Compact Disks (CDs)/Digital Video Disks (DVDs) placed in institutional libraries where it is publicly referred to.

establish a system of their registration and documentation. It will suitably extend the existing system of plant germplasm registration at NBPGR to register and document the elite and new breeds/strains of animals/poultry and fish developed in ICAR, at the National Bureau of Animal Genetic Resources (NBAGR) and National Bureau of Fish Genetic Resources (NBFGR), respectively. ICAR will monitor the registration and documentation activity in plants, animals and fish in public interest.

1.5.9 *Safeguarding ICAR's IP.* ICAR will put in place an IP watch system. This will include creating a detailed IP database and appropriate facilities for patent/IP search together with establishing a mechanism of market watch. Subject matter specialists in ICAR with the help of experts from legal and business backgrounds will monitor the internal, national and global scenario. Wherever requisite professional expertise is not available within ICAR such expertise will be obtained through engagement of consultants or outsourcing the task. The IP watch system will identify the IP that may require safeguarding from infringement as well as that which may have to be defended when challenged. Initial action can be taken according to the normal practice and procedures at respective levels. If, however, advanced legal action is required this will be taken with the approval of competent authority at the ICAR headquarters.

1.5.10 *Incentive and Stimulation for Research.* ICAR will provide incentive and share the benefits accrued from commercialization of its IPR enabled technologies with its scientists/innovators to encourage innovativeness. ICAR will follow the approach that is presently being applied by other public sector science and technology organizations¹¹. With the evolution of its IPR regime more incentives will accrue to ICAR researchers for greater innovativeness. However, all research results would not be amenable to commercialization. Areas of national interest and farmers' welfare may require technologies to be placed in the public domain from which no monetary incentives would flow to scientists/innovators. ICAR will, therefore, expand the scope of its existing rewards and awards system so that researchers addressing areas of public interest are suitably recognized and encouraged.

1.5.11 *Research Funding to ICAR.* In addition to budgetary support from central government ICAR receives research funding from other public and private sector agencies as well as externally aided projects. In all such cases, IPR will be shared on mutually agreed terms. In the collaborative projects where more than one partner is involved, multilateral agreement/memorandum of understanding (MOU)¹² will be signed and implemented together with a joint intellectual property management plan (JIPMP).

1.5.12 *Research Funding from ICAR.* The largest recipients of research funding from ICAR are the state agricultural universities (SAUs). The All India coordinated research in SAUs is governed by the umbrella MOUs between ICAR and the respective SAUs. To sustain partnerships in NARS under the evolving IPR regime, ICAR will review and modify the standing MOUs with SAUs to include sharing of IP on mutually agreed terms. Specific collaborative programmes under this umbrella will be covered as per respective memoranda of agreement (MOA).

1.5.13 *IPR Compatible System of Research.* To harness the benefits under the IPR regime, there will be IPR compatible formulation, execution, reporting and monitoring of research

¹¹ At present there is no legislation in the country for such incentives. ICAR guidelines will be evolved in harmony with any national legislation that may emerge in due course.

¹² See Annexure 7; suggestive only

projects in ICAR. Whenever IP generation is contemplated, patent search will be a prerequisite. Also, through the prior art search, duplication of efforts will be avoided. Research priority setting will be attuned to the scope of IP contemplated as well as freedom to operate for further/commercial use of research results, if required. ICAR recognizes and will continue to support the principle of research exemption for use of protected plant varieties and patented IP as stipulated in the Indian IPR laws. The research system will be sensitized to the judicious use of technology tools acquired under licensing arrangements (in-licences) for generating cutting edge technologies as well as pooled public IP for research use in the NARS (public IP pools). Necessary use of instruments such as material transfer agreement¹³ (MTA), MOU, MOA, confidentiality agreement¹⁴, licence agreement, etc., will be made to pre-record the mutually agreed terms of collaboration under the IPR regime.

1.5.14 *In-Licensing of Research Tools.* Several high cost, proprietary research tools may be necessary to ICAR institutions to conduct research in frontier areas of agricultural science. The terms of acquisition of such IPR protected tools would vary on a case-to-case basis, e.g. the licences could be for research alone or also for commercial use of the research results. ICAR recognizes that the economic and legal stakes in acquiring these tools and risks of freedom to operate could be high. Therefore, it will centralize the procurement and build up of proprietary research tools of strategic importance. Procurement will be facilitated/ made by the Agro-Technology Management Centre¹⁵ (ATMC) at ICAR headquarters on behalf of the ICAR in the form of multiple use licences/purchase (in-licensing) for various institutions. ICAR institutions will not procure proprietary research tools, especially from abroad, on their own but will communicate such requirements to ATMC in advance to enable timely procurement. The ICAR will obtain appropriate technical, business and legal advice for in-licensing through central procurement. It will reach agreements on IPR ownership, commercialization rights, publications, etc. with the technology proprietors/vendors on mutually agreed terms.

1.5.15 *Pooling IP Resources for Public Use.* ICAR recognizes that various NARS partners and related public research organizations in the country may be in possession of IPs that could be useful as resource/tool to enhance the overall research output. It may be cumbersome and expensive to procure and use such IP resources under the IPR regime if each partner of a network or a consortium has to enter into separate legal agreements with each of the other partners. ICAR will establish a cost-effective and transparent mechanism of pooling IP resources for research in the NARS and by other public sector organizations in the country. ICAR will contribute to the development of a multilateral system of pooling and utilization of IP resources by interested partners. It may hire legal/IPR and business experts to draw up multilateral agreements and work out other modalities. ICAR may volunteer its genetic resource bureaus or other selected institutions to act as repositories for custody and management of the pools. Simple retrieval mechanisms for use of pooled resources by partners will be worked out.

1.5.16 *Information Technology.* ICAR will increasingly use information technology for IP generation and management. It will develop its patent/IP search capacities. It will also streamline its IP database through intranet, establish patent/IP search facilities at its headquarters and at the identified zonal institutes. ICAR may also start on-line training and on-line publishing to disseminate awareness and knowledge on IPR issues, IP generation,

¹³ See Annexure 2; indicative

¹⁴ See Annexure 1; indicative

¹⁵ As proposed in these guidelines.

management of IPR portfolio, and transfer of IPR enabled technologies.

1.5.17 Human Resource Development. There is an urgent need for creating skilled human resources so as to build capacity and develop the agricultural research system that is compatible with IPR and commercialization requirements. Therefore, suitable HRD and training programmes will be organized for enhancement of knowledge, know-how and skill in IPR portfolio management and technology transfer, including the areas, such as, patent/IP search, IPR compatible record keeping, drafting MOUs, patent documents, licence agreements, confidentiality agreements, enhancing negotiation skills, patent/IP/market watch, dispute prevention/settlement, substantive and procedural aspects of litigation, etc. ICAR will make adequate allocation for training/HRD/capacity building in areas relevant to IP management and commercialization of IPR enabled technologies.

1.5.18 IP Management Budget. ICAR will earmark up to 5 per cent of its Plan budget for IP management and technology transfer/ commercialization¹⁶.

1.5.19 Institutional Arrangement for IP Management. The following centres/units/committees will be established at the ICAR headquarters and its institutions for the management of its IPR regime.

1. **Committees.** The Central Technology Management Committee (CTMC; short title for Central IP Management and Technology Transfer/ Commercialization Committee) at the ICAR headquarters, chaired by Director General, ICAR will be the apex decision-making body. All matters of policy concerning IPR portfolio management and technology transfer/ commercialization will be decided by the CTMC. At the respective ICAR institutions, the Institute Technology Management Committee (ITMC; short title for Institute IP Management and Technology Transfer/ Commercialization Committee), chaired by the Director of the Institution, will be final decision making body for IP related matters/progress/concerns. Selected institutes will be designated as Zonal. At the zonal level, the Zonal Institute Technology Management Committee (ZITMC; short title for Zonal Institute IP Management and Technology Transfer/ Commercialization Committee) will take decisions for the IPR portfolio management and technology transfer/ commercialization of the ICAR institutions in the zone and also the inter-institutional matters. The ZITMCs will also advise the institutions in the zone regarding their IPR portfolio and technology transfer matters. These central, zonal and institute level committees will take steps to coordinate, harmonize and synergize with other relevant committees at the ICAR headquarters/institutions.
2. **Centres/Units.** An Agro-Technology Management Centre (ATMC) will be established at ICAR headquarters for IP management and technology transfer/ commercialization. ATMC will function as the secretariat of CTMC at ICAR headquarters. At the level of ICAR institutions, Institute Technology Management Units (ITMUs) will be designated/established. These units will be responsible for IP protection/ management and technology transfer/ commercialization with internal capabilities as well as external legal and business experts wherever required. The ITMUs will act as Secretariat for the respective ITMCs. Selected ITMUs at national/central institutions in different zones shall be designated as Zonal Agro-Technology Management Centres (ZTMCs). These zonal centres will be strengthened for their IP management capabilities. ICAR will provide support to the ZTMCs. The ZTMCs will

¹⁶ A Plan Scheme will be prepared for IP Management and Technology Transfer/ Commercialization in ICAR with contribution from the central government and ICAR's own internal resources. The IP Management and Technology Transfer/ Commercialization initiative will have convergence with the business planning and development (BPD) component of the National Agriculture Innovations Project. (NAIP) (2006-2012). Till the time that the Plan scheme takes effect the IP Management and Technology Transfer/ Commercialization may be initiated with ICAR's own resources with convergence from the NAIP component.

act as Secretariat for the respective ZITMCs. They will advise and coordinate the IPR portfolio and technology transfer matters in various ICAR institutions in their respective zones. The ITMUs and ZTMCs will follow the guidelines and policy decisions taken by CTMC from time to time. The ATMC will oversee and provide necessary advice and support to ZTMCs and ITMUs.

1.5.20 *Agro-Technology Management Centre (ATMC).* The ATMC will function as an independent arm of the ICAR. It will be headed by a Chief Executive Officer (CEO) and may engage professionals with legal, business and various technical expertise on full-time or part time basis depending upon requirement. The ATMC will operate with functional autonomy and flexibility to facilitate the IP management and technology transfer/commercialization pursuits of ICAR. It will be funded under the ICAR Plan Scheme on IP Management and Technology Transfer/ Commercialization. In the long run, ATMC will generate its own resources through licensing fees and royalties, etc. to become financially independent of ICAR. It will efficiently liaise with ICAR technology users in all sectors -- private, cooperative, non governmental and public sectors. The ATMC will evolve mechanisms for the disclosure of IP generated in ICAR, its assignment for commercialization, valuation, pricing, licensing, patent/IP watch, market watch, and preventive and legal action to safeguard/defend the IP. It will also facilitate in-licensing of proprietary research tools and explore licensing of ICAR's IP abroad. ATMC will maintain/cause to maintain a centralized database. ATMC will also suitably support any future consortia of ICAR institutions in specific fields of research and IP generation.

1.5.21 *Functional Decentralization.* ICAR will promote functional decentralization of its IP protection and technology transfer/ commercialization efforts. The ITMUs and ZTMCs will be delegated the necessary powers. The ATMC will oversee the implementation and advise the institutions and zonal centres.

1.5.22 *Confidentiality.* ICAR will respect and also expect reciprocal treatment regarding all confidentiality aspects in its IP management. It would protect the confidentiality of its IP/information. ICAR will take up all matters relating to valuation, evaluation, validation and transfer of IPR enabled technologies only under appropriate confidentiality agreements¹⁷.

1.5.23 *Dispute Resolution.* ICAR will seek to resolve any dispute arising under its IPR regime through the arbitration mode under the Indian law. It would also be open to mediation and reconciliation. Decision to appoint an arbitrator and of the mode of arbitration will be that of the Director General, ICAR.

1.5.24 *ICAR-Private Sector Partnership.* ICAR recognizes that public-private partnership has the potential to improve agricultural research and technology transfer in the IPR regime. Such partnership will be useful in areas of mutual interest such as (i) joint validation of agricultural production technology, (ii) scaling up process, (iii) cost-effective quality production, (iv) mechanization of production technologies, and (v) joint exploration of local and global markets for the commercialization of technologies, etc. ICAR will develop and strengthen partnerships in identified areas with private sector. It will consider requests by the private sector R&D establishments and allow for use of the private sector its laboratory facilities/equipment on a case-by-case basis and as per terms and conditions of ICAR.

1.5.25 *Scientist Entrepreneurship.* ICAR recognizes that the laboratory scale technologies

¹⁷ See Annexure 1; indicative

generated by its scientists/innovators require scaling up for their commercialization. The commercial use of some of the ICAR technologies may also require validation, production and quality control under expert supervision. Some ICAR scientists/innovators involved in the development of these technologies may themselves be interested in taking up commercial ventures based on these technologies. ICAR, in principle, will encourage such entrepreneurship by its interested scientists.

1.5.26 Awareness of IP Management Policy. ICAR will promote general awareness, understanding and importance of IP management/ technology transfer/ commercialization among its staff, NARS and other partners, and stakeholders. ICAR will use various awareness tools and communication means, including media and Internet for the purpose.

1.5.27 Reports and Monitoring. The Governing Body of ICAR as well as the Institute Management Committees at the institution level will be informed of the IP progress/key developments for appropriate guidance from time to time. ICAR/institutions will develop suitable reporting and monitoring mechanisms for IP management related matters in a way as to rapidly secure protection and facilitate commercialization of IPR enabled technologies but not to compromise with the secrecy/confidentiality requirement.

1.5.28 Review and Update. ICAR will periodically review and update the IP Management and Technology Transfer/Commercialization Guidelines.

1.5.29 Ad interim/ Ad infinitum. If there are any issues which appear to fall short of or outside the provisions described in these guidelines, such cases, with full justification shall be referred to the CTMC/competent authority for decision.

1.6 Operationalization

The operationalization of the policy framework is described in the following chapters of these guidelines.

Chapter 2

Definitions

2.1 Introduction

This chapter describes the various terms and their definitions used for the purpose of these guidelines.

2.1 Definitions

Agro-Technology Management Centre (ATMC) means the Centre established at ICAR headquarters to manage its IPR portfolio and commercialize its IPR enabled technologies.

Assignment of IP to ICAR means *inter alia* transfer of deemed intellectual property right in invention/ work by the scientists/innovators of ICAR to the Council. It will be done through an undertaking duly signed by the concerned scientist(s)/innovator(s) and witnessed by two other persons.

Benefit Sharing in ICAR means the sharing of monetary benefits accrued from commercialization of its technologies among its scientists/innovators, institutions and headquarters including that for staff welfare fund.

Benefit Sharing would also mean, in relation to plant varieties where applicable, any sharing of the commercial benefits by ICAR from its registered/protected variety as may be determined by the PPV&FR Authority under section 26 of the PPV&FR Act. The benefit share thus determined shall be settled by the ICAR, being the institutional breeder and applicant/owner of PVP title.

Breeder within ICAR means a researcher belonging to any discipline/institution who has made principal contribution in the development of a variety.

Central Technology Management Committee (CTMC; short title for Central IP Management and Technology Transfer/Commercialization Committee, i.e. CIPM&TCC) means the committee constituted at the ICAR headquarters under the chairmanship of Director General, ICAR, which is the highest decision making body in the ICAR for IP management and technology transfer/ commercialization.

Commercialization in ICAR means the transfer of its IPR enabled technologies or other know-how through licensing under the terms and conditions specified in the licence agreement entered into for the purpose or through auction or sale.

Confidentiality Agreement means a document (in any format) signed by persons who have agreed to keep the particular information (whether already shared/to be shared in the course of collaboration) among them, whether oral, written or otherwise, as confidential and not to reveal it to any other party without each other's consent.

Core-Shared Facilities of ICAR means the specific laboratory facilities/equipment at the ICAR institutions, which may be allowed for use by another research establishment on its specific request and as per terms and conditions of ICAR.

Cost-Plus Rentals mean the rentals¹⁸ charged by concerned ICAR institution for the use of its core-shared facilities.

Director means the Director of an ICAR institute/bureau/national research centre and includes the Project Director of an ICAR directorate.

Exclusive Licence of an IPR enabled technology means a licence which will entitle the licensee, or the licensee as well as person(s) authorized by him, to exclude all other persons (including the patent holder himself) in the commercial use of the technology covered in the licence.

Foreign Client for ICAR means a client seeking to use ICAR's IP/know-how knowledge base abroad when it enters into a contract or agreement with ICAR for that purpose. It will deem to be (i) a legal entity registered/situated outside India, or (ii) a company registered in India with more than 50% equity holding by a foreign entity, or (iii) all United Nations and World Organizations/Bodies such as FAO, UNDP, CG institutions, foreign universities, foreign academic institutions, etc., or (iv) a Non Resident Indian (NRI).

Freedom to Operate means the extent (e.g. research use only, commercial use of the product or both) to which a licensee is [legally] free to use a proprietary research tool or IP acquired by him/her whether through a grant or a license agreement or purchase.

ICAR Institutions (or '**Institutions**') mean the network of institutions of the Indian Council of Agricultural Research (ICAR), including the Institutes designated with the prefixes Indian/National/Central, the National Academy, the National Bureaus, the Project Directorates, and the National Research Centres. These also include the Coordinating Units of All India Coordinated Research Projects/All India Network Projects (AICRP) and the *Krishi Vigyan Kendras* (KVK).

Infringement of ICAR's IPR will occur/deem to occur when someone willingly/unwillingly uses the IP/know-how without its permission.

In-Licensing means acquiring research-tools that are already protected by patents/IPR for research and technology generation under specific terms and conditions, e.g. research/commercial use.

Innovators in ICAR means its employees/post graduate research scholars who have made an invention/innovation or have authored a work or developed the variety or generated IP in any other form.

Institute Technology Management Committee (ITMC; Short title for Institute Intellectual Property Management and Technology Transfer/Commercialization Committee, i.e. IIPM&TCC) means the committee constituted at the level of an ICAR institution, chaired by the Institute Director, for addressing IP related matters of the institution.

¹⁸ As detailed in the ICAR Rules and Guidelines for Training, Consultancy, Contract Research and Contract Services, 1997 (Johl Committee Report)

Institute Technology Management Unit (ITMU) (Short title for Intellectual Property Management and Technology Transfer/Commercialization Unit at institute level, i.e. IPM&TTU) means the unit designated/set up in the ICAR institutions for management of its IP/deemed IP and transfer/commercialization of technologies.

Intellectual Property (IP) in ICAR constitutes the research results derived by its scientists/innovators which could be protected by patents, plant variety protection or any other form of intellectual property rights such as copyright, trade mark, design, etc. This also includes know-how that may be protected as undisclosed information by suitable agreements.

IPR Enabled ICAR Technologies means the technologies available at ICAR which have been protected by patents, plant variety protection or any other form of IPR in India/abroad over which ICAR has exclusive right for commercialization.

Joint Intellectual Property Management Plan (JIPMP) means a document embodying the mutually agreed terms concerning the IP aspects of collaborative research jointly carried out by the research partners. This includes the ownership details and conditions for use of IP resources already available with different partners, mutually agreed terms for in-licensing of proprietary research tools, sharing the ownership of IP generated, licensing of IPR enabled technologies, and sharing of commercial benefits, etc. Joint IP management plan can be altered mid-way with mutual consent of research partners.

Know-How means steps in the use of an IP that have strategic or commercial value. Know-how may be protected as undisclosed information (a standard/form of IPR) by suitable agreements.

Licence means the document embodying legal permission from ICAR to the other party(ies) to use its technologies/IP/Knowledge for commercial or other purposes under the terms and conditions and limitations, including a licence fee and/or royalty, as negotiated and specified in the licence.

Material Transfer Agreement (MTA) means a document embodying the mutually agreed terms in the transfer of a material (any genetic resource or IP) from ICAR to another organization/ establishment/ person or vice versa. It may be in a standard or a specific format.

Non-Exclusive Licence of an IPR enabled technology means a licence which will confer on the licensee the right to commercially use that technology whereas, at the same time, the same right could also be made available to other licensee(s) on same, similar or different terms.

Partnership by ICAR in research with other research organizations/establishments means undertaking research in togetherness, by agreement. Deemed agreement of partnership is set out in the project document which covers details of objectives, work plan, activities by each partner, respective rights and obligations of each party, other terms, conditions and limitations, if any. Partners would share the ownership of research results as per the mutually agreed terms. They also owe each other the responsibility of good faith and shall be jointly and severally liable for the debts of the partnership, whether or not they were concerned in incurring them. ICAR partnerships with state agricultural universities are based on broad Memorandum of Understanding rather than separate agreements for each research project.

Principal Investigator (PI) for a research project carried out in ICAR means the lead scientist involved in and responsible for it.

Project Coordinator (PC) for the purpose of these guidelines means the officer-in-charge of an All India Coordinated Research Project (AICRP); and this also includes the officer-in-charge of All India Network Project i.e. 'Network Coordinator'; or a 'Nodal Officer' in-charge of an All India Network Project of ICAR.

True and First Inventor means a scientist/innovator who has created/generated the patentable research results and whose name is recorded in the patent application accordingly.

Zonal Agro-Technology Management Centre (ZTMC; Short title for Zonal Intellectual Property Management and Technology Transfer/Commercialization Centre, i.e. ZIPM&TTC) means the centre established at the identified zonal institute to manage IP protection/ maintenance and technology transfer/ commercialization of the institute and to coordinate and facilitate/ manage IP for ICAR institutions in the zone.

Zonal Institute Technology Management Committee (ZITMC; Short title for Zonal Intellectual Property Management & Technology Transfer/ Commercialization Committee, i.e. ZIPM&TCC) means the committee constituted at the identified zonal institute to facilitate/ manage IP protection/ maintenance and technology transfer/ commercialization for ICAR institutions in the zone.

Chapter 3

Intellectual Properties Generated in ICAR

3.1 Introduction

This chapter describes the IP generated in the ICAR in terms of (i) nature of IP ownership whether exclusive or joint with other partners/collaborators, and (ii) different forms of IP.

3.2 Exclusive Ownership of IP

ICAR will be the sole owner of IP generated from research work conducted in ICAR in the following cases:

1. Using funds received from Central Government (DARE) through the budgetary process¹⁹.
2. Using external funds, public or private where ICAR has been assigned sole ownership by the funding agency or where such prior agreement with the funding agency does not exist, e.g. (i) Funds received from sponsoring agencies under grants-in-aid²⁰, (ii) Funds received as donation/ endowment²¹, (iii) Funds received for scholarships²², and (iv) Funds received under bi-lateral or multi-lateral funding arrangements²³.

3.3 Joint Ownership of IP

3.3.1 *Collaborative Research.* IP generated by ICAR institutions under collaborative research projects will be jointly owned by the ICAR and its collaborators/ partners on mutually agreed terms²⁴.

3.3.2 *Post Graduate Research.* IP generated in research by post graduate research scholars in ICAR will, in principle, be jointly owned on mutually agreed terms in the following cases:

1. If the terms and conditions of scholarship from the external funding agency so require²⁵.

¹⁹ IP generated by scientists/ innovators as part of their service/ employment in ICAR belongs to the employer, i.e. ICAR. Ownership of research results obtained by research scholars in ICAR vests in ICAR.

²⁰ For example, Department of Bio Technology (DBT), Department of Science and Technology (DST), etc., Government of India

²¹ Chair such as B.P. Pal chair

²² For example, ICAR Fellowship, Commonwealth Fellowship, Fulbright Scholarship, etc., awarded to ICAR scientists as in-service students or regular students in deemed universities/institutions of ICAR.

²³ The research carried out may include collaborative or contract research. ICAR may accept funding for some agricultural research projects from others on the considerations which are larger than IPR alone. However, in some cases, the sole input for IP generation is to be given only by the ICAR. In such cases, it is logical that ICAR owns the IP generated. However, the mutual agreed terms other than this reached between ICAR and the funding agency, if any, should be clearly spelt out in a written Agreement.

²⁴ For example, IP is generated from any collaborative research efforts carried out in ICAR or in any other institution/university/any other entity, whether Indian or foreign, where the agreement between ICAR and the collaborator requires the joint ownership of IP.

²⁵ In most cases post graduate research in ICAR is carried out under ICAR fellowships. However, in few cases post graduate scholars in ICAR may avail scholarships from other agencies. The terms and conditions of some of these scholarships may require that the IP generated will be jointly owned with the funding agency. In such cases, with the approval of competent authority, ICAR may accept this condition or negotiate/work out any other terms and conditions with the concerned agency.

2. If the post graduate research is conducted at more than one institutions/laboratories in/outside ICAR²⁶.

3.3.3 Shared Research Facilities. When ICAR shares its research facilities with another party as per the guidelines but does not provide any scientific/technical input in the use of these facilities, it may not seek a share in the IP generated. However, in cases where the other party also avails scientific/technical input from ICAR, the IP thus generated will be jointly owned on mutually agreed terms.

3.3.4 Scientist/ Scholar Entrepreneurship. When ICAR permits any scientist/ scholar to proceed on scientist-entrepreneurship to either set-up his/her own enterprise or to work with some private agency for up-scaling/ commercial venture with the IP generated by him/her in ICAR, the terms of use of such IP shall be clearly spelt out in the agreement between the ICAR and the concerned scientist/ scholar.

3.4 Event of Conflict of Interest

In the event of any conflict of right or interest related to sharing of IP, it will be resolved as per mutually agreed terms set out in the agreement signed between ICAR and the other party. To arrive at a settlement use will be made of mediation, reconciliation or arbitration. Arbitrator will be appointed by Director General, ICAR. Arbitration clause may be incorporated in the agreement.

3.5 Forms of IP Generated in ICAR

3.5.1 The research results obtained in ICAR may be patentable, protectable in any other form of IP or not protectable under the law. Further, issues such as know-how and traditional knowledge may be important in the context of IP.

3.5.2 Patentable IP. Research results in any field of technology, whether processes or products, which are new, inventive (non-obvious) and useful (industrially applicable), and are patentable under the Patent Act, constitute the patentable IP of ICAR²⁷. The following research results in ICAR, for example, will constitute the patentable IP:

²⁶ Where post graduate research is carried out in more than one institution/laboratory, including one outside ICAR, the IP generated may be jointly owned, in principle, on mutually agreed terms with the concerned institutions/universities from which the other research guidance/supervision emanates.

²⁷ As per Sec. 3 of the Patents Act, 1970 as amended in 2002 and 2005, the following are not inventions within the meaning of this Act, - (a) an invention which is frivolous or which claims anything obvious contrary to well established natural laws; (b) an invention which is contrary to public order or morality or which causes serious prejudice to human, animal or plant life or health or to the environment; (c) the mere discovery of a scientific principle or the formulation of an abstract theory or discovery of any living thing or non-living substances occurring in nature; (d) the mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant. *Explanation.*—For the purposes of this clause, salts, esters, ethers, polymorphs, metabolites, pure form, particle size, isomers, mixtures of isomers, complexes, combinations and other derivatives of known substance shall be considered to be the same substance, unless they differ significantly in properties with regard to efficacy; (e) a substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof or a process for producing such substance; (f) the mere arrangement or re-arrangement or duplication of known devices each functioning independently of one another in a known way; (g) void, (h) a method of agriculture or horticulture; (i) any process for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings or any process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products; (j) plants and animals in whole or any part thereof other than microorganisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals; (k) a mathematical or business method or a computer programme *per se* or algorithms;

1. Various microorganism based formulations, such as those of bio-control agents, bio-fertilizers, specific dairy catalysts, etc., and the processes for their use.
2. Various genetically engineered microorganisms for an array of specific uses, such as bio-degraders, bio-stimulants, bio-protectants, etc., and the processes related to their application/use.
3. Novel dairy and horticultural products, bye-products, such as enzymes, and processes for their production and use.
4. Plant based agro-chemicals²⁸, their purification and testing processes, and various formulations.
5. Diagnostic kits.
6. Agricultural machinery, implements, and laboratory equipment.
7. High value compounds from terrestrial, aquatic and living systems, such as animal rumen, internodal cavities of bamboos, etc.
8. Novel genes from microbial and higher biological systems; research tools of genetic engineering, such as gene primers, constructs, and gene transfer tools like gene gun, etc.
9. Information systems and software, etc.
10. Patentable part of know-how, for scaling up of research results or manufacture of prototypes/ commercial products, etc.

3.5.3 Patents on Microorganisms. ICAR will seek patents on microorganisms as per the Patents Act. In particular, it will not seek patent on a microorganism in the same form in which it is retrieved from its natural habitat.

3.5.4 Protection of Plant Varieties. ICAR varieties of field, horticultural and agro-forestry crops, including the new, extant, essentially derived varieties (EDV), and transgenic plant varieties protected as per the PPV&FR Act/ plant variety protection (PVP) laws of other countries will constitute its protectable IP. These include

1. All extant varieties of ICAR, i.e., the previously notified varieties under section 5 of the Seeds Act, 1966, which have not completed 15 years from date of their notification. Protection of these varieties will be secured at the earliest²⁹.
2. New plant varieties identified for their worth (value for cultivation and use) in ICAR, which fulfill the essential criteria of distinctiveness, uniformity, and stability under the PPV&FR Act.
3. ICAR plant varieties and transgenic plants, protectable as per corresponding PVP laws of other countries, in the form of PVP certificate, plant patent, etc.

3.5.5 Improved Breeds/ Strains of Animals/ Poultry/ Fish Cannot be Protected. Animal/ poultry breeds, fish strains, etc., cannot be protected in India as patents or variety protection. Improved breeds/ strains developed in ICAR, however, constitute valuable assets. To check their misuse or exploitation, ICAR will develop a system of their registration and documentation, at the respective National Bureaus of Animal and Fish Genetic Resources for quickly placing them through disclosure in the public domain thereby forestalling any unforeseen patenting in other countries.

(l) a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever including cinematographic works and television productions; (m) a mere scheme or rule or method of performing mental act or method of playing game; (n) a presentation of information; (o) topography of integrated circuits; (p) an invention which, in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components.

²⁸ See Annexure 12, "A sealed ICAR Patent on Azadirachtin".

²⁹ As per the PPV&FR Rules the extant varieties will have to be registered within three years from the date of notification of the relevant provision.

3.5.6 **Collective Mark/ Trademark.** The ICAR emblem is distinct/ distinguishable and well known for a long time. It will be used/ registered as the collective mark of ICAR. Other marks already used in good faith by ICAR institutions, for example 'PUSA' by Indian Agricultural Research Institute or 'Arka' by Indian Institute of Horticultural Research, which are also well known for a long time, may be used/ registered and used as their respective trademarks along with the collective ICAR mark.

3.5.7 **Copyright.** ICAR's copyright exists in all its institutional creations/ works, viz., publications, audio-visuals, designs, computer programmes, etc., whether unregistered or registered. Scientists and other staff of ICAR will, however, have copyright over their individual, literary and scientific creations/ works.

3.5.8 **Designs.** Designs of any commercial value, developed in ICAR, may be protected as registered designs under the Designs Act or under the Copyright Act as per law.

3.5.9 **Any Other IPR Form.** On a case-to-case basis, any research result of ICAR, which is protectable as IPR in any other form under the Indian law, shall be protected and maintained for its IPR enabled transfer and use.

3.5.10 **Know-How.** A know-how available with ICAR, which could lead to development of prototype/ commercial product from an IP generated by its scientists/ scholars, constitutes an important, potentially useful property, irrespective of whether it is patentable or not. Such know-how may be utilized for strategic commercial use in the technology production chain. ICAR may protect such know-how as trade secret. Therefore, a confidentiality agreement³⁰ with the other party shall be entered into before any demonstration of the technology or its validation or scaling up is undertaken.

3.5.11 **Traditional Knowledge.** The Indian Patents Act and some other IPR Acts require a disclosure of traditional knowledge used in the invention/innovation. Accordingly, ICAR shall also disclose the traditional knowledge related to the innovations made in its set up in all its patent/ IPR applications to the best of its knowledge and information.

3.5.12 Isolation of indigenous genes from plant and animal systems and their application for specific target traits will have special significance and prospects. Therefore, ICAR genetic resources bureaus for plants, animals, fish and agriculturally important microorganisms will make efforts to register, document and index these knowledge items in public domain. This is to discourage any patenting of the public domain traditional knowledge.

³⁰ See Annexure 1; indicative

Chapter 4

General Procedures for IP Management

4.1 Introduction

This chapter describes the general procedures for management of the IPR portfolio in ICAR. Procedures specific to patents, protection of plant varieties, trade marks, copyrights, etc., are discussed in subsequent chapters.

4.2 Claims of IP Ownership

4.2.1 *ICAR/Institutions*. All claims of IP ownership, as applicable, will be made only in the name of the legal entity, viz. the 'Indian Council of Agricultural Research' even though the research is conducted by scientists/innovators working in its various institutions. The institutions shall not claim the IP ownerships in their own names.

4.2.2 *Scientists/Innovators*. ICAR scientists/innovators shall assign the IP rights in the research results obtained by them to their employer, viz. the 'Indian Council of Agricultural Research'. While they will not be entitled to claim ownership of the IP generated by them, they shall be recognized as 'True and First Inventor(s)/ Innovator(s)' of that IP. However, they will have their own copyright over the publications authored by them as per rules³¹.

4.3 Institutional Arrangement

4.3.1 *Institute Technology Management Units (ITMUs)*. ICAR institutions³² will designate/ establish ITMUs. The ITMUs will pursue all IP protection, maintenance and transfer/ commercialization related matters at the institute level as per these guidelines and any other administrative or policy decisions taken in the ICAR from time to time. They will seek any specific, case-to-case basis advice/assistance from the Zonal Agro-Technology Management Centres (ZTMCs) at the zonal level or the Agro-Technology Management Centre (ATMC) at the ICAR headquarters.

4.3.2 *Zonal Agro-Technology Management Centres (ZTMCs)*. ICAR will establish ZTMCs at selected national/central institutions³³ in different zones identified as the zonal level institutes. The ZTMCs will function as Secretariat of the respective Zonal Institute Technology Management Committees (ZITMCs) to advise on, coordinate and pursue the IP protection, maintenance and transfer/ commercialization related matters at other ICAR institutions³⁴ in the zone. The ZTMCs will be supported by ICAR for enhancing IP management capacities. The ZTMCs will follow the guidelines and policy decisions taken in the ICAR from time to time. The ZTMCs will assist other ICAR institutions, including the

³¹ Central Civil Services (Conduct) Rules [CCS(Conduct)Rules]

³² National/Central/Indian Institutes, Bureaus, Project Directorates and National Research Centres of ICAR

³³ The identified zonal institutes will also have their respective ITMUs for the management of IP generated within the institute.

³⁴ Including the AICRPs and the ICAR KVKs.

AICRPs and ICAR KVKs in the zone on a case-to-case basis in matters relating to IP management and technology transfer/ commercialization.

4.3.3 *Agro-Technology Management Centre (ATMC).* The ATMC will be established at the headquarters as an independent arm of the ICAR for IP management and technology transfer/ commercialization in India and abroad. The ATMC will also act as Secretariat to the Central Technology Management Committee (CTMC) at the ICAR headquarters³⁵. It will render advice and support to the ZTMCs and the ITMUs as required. It will undertake documentation with the help of ITMUs/ZTMCs and maintain IP database of ICAR. The ATMC will arrange for necessary legal and business expertise through empanelment/ engagement of experts or outsourcing etc. It will also organize/ support the IP management training and HRD programmes. The ATMC will organize IP/market watch. The ATMC will be headed by a Chief Executive Officer (CEO) and it will operate with full freedom and flexibility. It may empanel and engage experts from legal, business, economics/commerce, finance and various technical areas on full-time or part time basis as per the requirement.

4.3.4 *Preliminary Steps.* The following steps will be taken to seek IP protection in ICAR:

1. All inventors/innovators/breeders/authors shall assign the IP rights in their research results to ICAR.
2. All applications shall be made in the name of “Indian Council of Agricultural Research”.
3. Patent/PVP/IPR applications filed by ICAR, shall mention the names of all concerned scientists/innovators as True and First Inventors/Innovators.
4. Patent/PVP/IPR applications will be signed by the Authorized Signatory (Director of the concerned institution/zonal institute).
5. Processing of all patent/PVP/copyright/other IPR applications and maintenance of IPR titles will be undertaken as per the respective IPR laws.

4.4 Procedures for IP Management

4.4.1 *Delegation of Powers/Authorized Signatories.* ICAR will delegate its powers as per rules for the protection/ maintenance/ commercialization/ licensing of IP to its institutions. Directors of the institutions and the Assistant Director General (IPR) shall appropriately act as the Authorized Signatories of ICAR³⁶.

4.4.2 *Disclosure of IP Contemplated.* The ICAR scientists/innovators at its institutions shall appropriately/confidentially disclose³⁷ the IP contemplated from their research results for IPR protection under the law.

4.4.3 *IP Protection and Maintenance.* All action pertaining to the filing of IPR applications and their follow up under the law including the maintenance of IPR, and the further management of IP, will be initiated/undertaken by the ITMUs of the respective institutions, where IP is generated in the course of research/work.

³⁵ Details of ATMC are given in Chapters 1 and 10.

³⁶ ADG (IPR) is already the Authorized Signatory; and ICAR has further issued instructions vide Office Order F.No. 6(2)/2001-Cdn(A&A) Dated 1.12.2005 to all Directors/Project Directors of ICAR Institutes/ National Research Centres/ Bureaux/ Project Directorates to file their patent applications at the respective patent offices in whose jurisdiction the concerned institution is located.

³⁷ See Annexure 3; indicative.

1. The ICAR institutions having IP management capabilities of their own may file the patent/IPR applications as per the delegation of powers.
2. ITMUs that do not have adequate IP management capabilities of their own will approach the ZTMC in their zone/ATMC for protection and management of IP generated by them, which is also recommended by their ITMCs as being protectable and worth protecting. The respective ZTMCs will manage IPR protection and maintenance for the institutions³⁸ in the zone.
3. The foreign patent cases in ICAR will be managed through the ATMC. Institutions/zonal institutes will approach ATMC accordingly.

4.4.4 IP Generated in More Than One Institution. Where IP is generated as a result of research in more than one ICAR institution, the IP protection will normally be secured by the institution where Principal Investigator (PI) of the project was posted. In any other situation, the action for IP protection will be taken in mutual consideration and consent of the concerned institutions. The ICAR headquarters/ATMC will be informed accordingly. In case of any difference of opinion or discrepancy³⁹, the institution, where PI of the project was posted will refer the matter to the ICAR headquarters for guidance/decision.

4.4.5 IP Generated in a Coordinated Project Located in an ICAR Institution. Where IP is generated under an All India Coordinated Research/Network Project (AICRP) whose coordinating unit is located in an ICAR institution, the IP protection will be secured by the institution where the AICRP Unit is located. The Project Coordinator/Network Coordinator/Nodal Officer (PC) of the AICRP where the IP is generated will inform the Director/ITMU of its host Institution of the IP which needs protection. The respective ITMU will then initiate action for securing/ maintenance of IPR as per guidelines/respective IPR law.

4.4.6 IP Generated in a Coordinated Project Located Outside an ICAR Institution. Where IP is generated under an AICRP whose coordinating unit is not located in an ICAR institution, the IP protection will be secured by the ZTMC in whose domain the AICRP unit is located. The Project Coordinator of the AICRP where the IP is generated will inform the concerned ZTMC the details of the IP required to be protected with a copy to ICAR headquarters/ATMC. The ZTMC will then initiate action to secure and maintain the IPR with the involvement of the concerned Project Coordinator.

4.4.7 IP Generated in a Krishi Vigyan Kendra. Where IP is generated in a *Krishi Vigyan Kendra* (KVK), the IP protection will be secured by the ZTMC in whose domain the KVK is located. The In-charge KVK where the IP is generated will inform the concerned ZTMC the details of the IP required to be protected with a copy to ICAR headquarters/ATMC. The ZTMC will then initiate action to secure and maintain the relevant IPR with the involvement of the concerned KVK.

4.4.8 IP Generated in Post Graduate Research in ICAR. Where IP is generated as a result of post graduate research the IP protection in such cases will be secured by the institution where the research was carried out. The research supervisor/guide will facilitate action for

³⁸ In the initial phase, small ICAR institutions which do not have adequate IP management capabilities of their own may approach respective ZTMC in the Zone for protection of IP generated by their scientists/innovators, which is protectable and worth protecting, and maintenance of IPR.

³⁹ All individual IPR related cases involving the transfer or retirement of an inventor/innovator in the mid-course of research, where decision making has been constrained due to a difference of opinion or discrepancy, shall be referred with details to respective ZTMC/ATMC for decision of the competent authority.

seeking the IPR protection. The concerned post graduate research scholar will be recognized in the patent/IPR application as one of the 'True and First Inventors/Innovators'.

4.4.9 IP Generated in Collaboration with a Foreign Partner. Protection of IP shall be undertaken by the concerned ICAR institution. Application shall be filed in India to secure the priority date. The IP ownership and further course of action will be decided on the basis of policy framework for IP management and mutually agreed terms with the foreign partner.

4.4.10 IP Generated in all Other Cases. In all other cases of IP contemplated, the IPR protection will be undertaken as appropriate by the concerned ZTMCs on their own or in consultation with ATMC and with the approval of the competent authority at the ICAR headquarters.

4.5 Procedure for Shared IP

4.5.1 IP shared between ICAR and other collaborator(s)/partner(s) will be processed for protection and maintained by ICAR or as per the mutually agreed terms.

4.5.2 In case a joint owner is not interested in the IP it can be assigned back exclusively to ICAR. In that case the protection and maintenance of IP shall be taken up by the concerned ICAR institution with assistance from the respective ZTMC/ATMC.

4.6 Decision Making Bodies

4.6.1 **Technology Management Committees** will be constituted at different levels in ICAR to act as the decision making bodies for addressing the matters related to IP management and technology transfer/ commercialization, including monitoring. While the core structure of these committees at the institution level will remain the same, the technical experts will be drawn from different areas/disciplines depending upon whether the Committees are discussing patents, protection of plant varieties or other forms of IP. Thus, in chapters 5, 6 and 7 the committees remain the same, only the technical experts and special invitees may be different. Further, a national IP advisory Committee will consider/advise on various IP matters related to agricultural research and education in the country. While operationalizing the decision making process involving the three tier technology management committees at the institutes, zonal and central levels care will be taken to ensure that these bodies have the facilitator function as the prime motive.

4.6.2 **Central Technology Management Committee (CTMC).** At ICAR headquarters, a high powered committee viz. the CTMC chaired by DG, ICAR will be the highest decision-making body on issues related to IP management and technology transfer/ commercialization in ICAR. The CTMC will have the following composition:

DG, ICAR	Chairman
Secretary, ICAR	Member
Financial Advisor, ICAR	Member
4 DDGs	Members
1 Vice Chancellor of an SAU (by rotation)	Member
2 Directors from ICAR institutions	Members
1 Representative of a ZITMC	Member
1 Expert in Law	Member
1 Expert in Economics/Commerce	Member

1 Expert in Business Management	Member
CEO, Agro-Technology Management Centre	Member Secretary

1. The CTMC will decide matters relating to IP management, such as IP ownership, licensing/transfer of technologies, sharing of incentives, financial ceilings, etc.
2. The CTMC may invite experts from within the Council or outside.
3. Committee will meet at least twice a year.
4. Non official members/invitees for individual meetings will be entitled to TA/DA and honorarium/consultation fee.

4.6.3 **Zonal Institute Technology Management Committee (ZITMC).** At the zonal level, the ZITMC chaired by Director of the identified zonal institute will address specific and emergent IP related matters/ concerns with respect to the ICAR institutions in the zone. The ZITMC will have the following composition⁴⁰:

Director (of the identified zonal institute)	Chairman
1 Director of another ICAR institution in the zone	Co-Chairman
1 Director/Representative of another ICAR institution in the zone	Member
1 Chief/ Senior Finance Officer	Member
2 Technical Experts (Scientists of ICAR institutions) ⁴¹	Members
1 Representative of ATMC/ICAR headquarters	Member
2 Expert Members, one each in Business Management/ Commerce, and Law	Member
ZCEO, Zonal Agro-Technology Management Centre	Member Secretary

1. Chairman may invite experts/officers from the concerned institutions in the zone/ICAR and/or from outside, as per requirement.
2. The ZITMC will consider issues/cases of concern to the institutions in the zone.
3. The ZITMC may seek advice of ATMC/ICAR headquarters for wherever required.
4. The ZITMC will meet at least twice a year
5. Non official members/invitees for individual meetings will be entitled to TA/DA and honorarium/consultation fee.

4.6.4 **Institute Technology Management Committee (ITMC).** At the institution level⁴², the ITMC chaired by Director of the Institution will be the highest decision making body relating to all issues of IP management and technology transfer/commercialization. The ITMC will have the following composition⁴³:

Director	Chairman
1 Head of Division ⁴⁴	Member
2 Technical Experts (Scientists of the institution)	Members
1 IPR Expert (Scientist from ICAR institutions in the zone)	Member
Member Secretary, Staff Research Council (SRC)	Member
Officer-in-charge, ITMU	Member Secretary

⁴⁰ In addition, Director of the concerned institution whose IPR/commercialization related matter figures in the agenda item of a meeting of the committee or his representative shall participate in that meeting as member.

⁴¹ The Committee may have experts from the respective disciplines as members to consider specific matters brought before it in respect of different forms of IPR, viz. patents, plant variety protection or other IP.

⁴² The identified zonal institutes will also respectively have their regular ITMCs for IP/technology management at the institute level in addition to the ZITMC, which will consider/address IP matters of all ICAR institutions in the zone on a case-to-case basis.

⁴³ In addition, the committee may have experts from the respective disciplines as members to consider different matters brought before it in respect of patents, plant variety protection, other IP, etc.

⁴⁴ The ITMUs of the identified zonal institutes may additionally have one Joint Director as member.

1. Director may invite experts/officers at the institution/ICAR and/or from outside, as per requirement.
2. The ITMC will consider the issues/cases of concern to the institution/scientists as per the delegation of powers and shall recommend for action/help/assistance by ZITMC/ATMC/ICAR headquarters.

4.6.5 IP Advisory Committee in Agricultural Research (IPAC). The IPAC will be constituted under the Chairmanship of Secretary DARE and DG, ICAR, to advise on IP matters. The Committee will have inter-ministerial/ inter-departmental representation as well as the representation of the state/central agricultural universities. It may co-opt experts for participation in individual meetings of IPAC as required. The tenure of the Committee shall be two years. It will meet annually. The ATMC will provide the analytic spade work/ critical analysis of specific matters/ agenda items for the IPAC meetings. The IPAC may tender advice in particular on the following matters:

1. Evolution of IPR system in the agro-technology sector in the country/abroad.
2. Harmonization and coordination in the inter-ministerial dealing with IPR matters in agriculture.
3. Protection/maintenance of IPR and licensing of IPR enabled Indian agricultural technologies in other countries.

4.7 Confidentiality Agreement

All concerned scientists/innovators and other employees of ICAR institutions shall enter into appropriate confidentiality agreement⁴⁵ before divulging any undisclosed information/ research results/ know-how even if it is to be disclosed for a short term. Confidentiality of the technological aspects/IP of ICAR must be ensured.

4.8 Progress Reports

Concerned institutions shall maintain proper and authenticated records/database with respect to the IP generated and disclosed/reported by the scientists/innovators, securing/maintenance of IPR protection, commercialization and incentives, and sharing of commercial benefits with the concerned staff. They shall periodically submit progress report⁴⁶ to ICAR headquarters.

4.9 Monitoring and IP/Market Watch

The ITMUs/ ZTMCs at the respective institutions, in consultation with the ATMC at the ICAR headquarters will monitor the IP and technology management activities⁴⁷.

⁴⁵ See Annexure 1; indicative

⁴⁶ See Annexure 16 for few relevant Performa; suggestive only

⁴⁷ See Annexure 16; suggestive only

Chapter 5

Procedures for Management of Patents

5.1 Introduction

This chapter describes procedures for seeking patents and their maintenance in Part A. Part B deals with some general issues related to patenting.

Part - A

5.2 Procedure for Patent Protection

5.2.1 All research results in ICAR which are patentable under law and have scope for technology transfer or for advancement of basic and strategic research, will be taken up for patent protection as per these guidelines.

5.2.2 All ICAR scientists/innovators who consider that they are in possession of a patentable IP from their research results, or that such a result is likely to emerge soon from their research/work, whether individually or jointly with other scientists/innovators, shall proceed to take steps through the ITMU/ZTMC of their respective institutions as per the patent law.

5.2.3 The ITMU/ZTMC will arrange meeting of the concerned ITMC/ZITMC to consider/recommend the patent proposal. They may also invite expert opinion under a confidentiality agreement with empanelled patent attorney/IPR expert. The ITMC/ZITMC will duly record the reasons for acceptance/ rejection of each patent proposal in the proceedings of their meetings and such information will be linked to central database.

5.3 Preparatory Work

5.3.1 **Initial Action by Innovators.** The interested scientist/innovator may approach Director or ITMU/ ZTMC of the institution where he/she is posted and indicate his interest in making a confidential disclosure⁴⁸ of the patentable IP generated/likely to be generated soon by him/her.

5.3.2 **Initial Patent Search.** Each application by scientists/innovators for seeking patent on an invention shall be accompanied with an initial patent search⁴⁹ report and the declaration as to the novelty of invention.

⁴⁸ See Annexure 3; suggestive only

⁴⁹ Initial patent search can be carried out at the free Internet sites for foreign patents provided by uspto.gov and espacenet.com, and EKASWA A&B Databases for Indian patents, which may be available from Patent Facilitating Centres (PFC), Technology Information Forecasting and Assessment Council (TIFAC), Department of Science & Technology, Government of India, etc.

Concerned scientists must gain a good background on the subject area of invention, particularly about the inventions from the subject area if already patented in any country. This will help in recognizing whether the results of present study/ experiment qualify for the essential criterion of novelty or not. In case it is considered that the invention is novel, and the patent search is reasonably made to fortify the claim, one may safely conclude that ICAR is in possession of a patentable invention.

5.3.3 Early Action by Institutions. The concerned ITMU/ZTMC will fix a confidential meeting at a convenient date and time for discussion, and the matter shall be pursued as follows:

1. In case research results are known to the scientist/innovator and he/she believes that the IP generated can qualify for IPR protection, he/she shall not publish or divulge any information on the results till before the confidential meeting. Subsequently, he/she should act as per the outcome of the meeting.
2. The ITMU/ZTMC will arrange a confidential meeting of the scientist with ITMC/ZITMC and other invited persons from the institution. Before initiating discussion in relation to the deemed IP, all participants of the meeting shall sign an undertaking to maintain confidentiality of the information divulged by the scientist.
3. Based on recommendations of ITMC/ZITMC the ITMU/ZTMC will pursue the matter for further action.
4. If it is required to file a patent application outside India the ITMU/ZTMC will approach ATMC at the ICAR headquarters and assign the IP. Similarly, all Indian patent applications on which it is decided to claim priority date to convert them into Patent Cooperation Treaty applications will be assigned to the ATMC for further necessary action.

5.3.4 Submission of Particulars by Scientists/Innovators. The Principal Investigator/Project Leader (PI) shall furnish particulars⁵⁰ for making the application (specification, claims and other particulars excluding the know-how) with due signatures of all Inventors/Innovators together with the following to the ITMU/ZTMC:

1. An Undertaking covering the bona fides of the deemed IP, including title; novelty, non-obviousness/inventiveness, industrial applicability/commercial usefulness aspect; project/activity under which the IP was generated; dates/duration of the project/activity, etc.
2. A Certificate mentioning that there is no lawful ground for objection to the grant of patent on the innovation/work.
3. An Affirmation to keep ICAR informed about any further developments in relation to the deemed IP.
4. Assignment of the innovation/work to ICAR, with signatures, names and address of two witnesses.

5.3.5 Information to Central Database. The ITMU/ZTMC will document a copy of the forwarding letter of the information provided by the PI/Inventor, including the title of invention, name(s) of true and first inventor(s), and date, in the institutional/zonal/central database for information and record.

5.3.6 Disclosure Requirements. It is necessary that the concerned PI/scientists/innovators make sufficient disclosure that fully defines the invention, its feasibility and application so that patent can be granted on that disclosure without any objection. They will also make sure that the source and geographical origin of the biological material used in research or mentioned in the complete specification and also any traditional knowledge of India, which may be the basis of the invention is disclosed in the application as per the requirement of the Patents Act. Similarly, it will be necessary that the absence of any Genetic Use Restriction Technology (GURT) is declared in all applications based on biotechnological invention/genetic engineering.

⁵⁰ The particulars shall also include mention of transfer or retirement cases where an inventor/innovator has left the institution in the mid-course of research, and his/her relative contribution to the invention/innovation.

5.4 Record Keeping

5.4.1 All ICAR scientists/ innovators shall maintain appropriate and adequate work records and duly authenticated/ countersigned log books while conducting research leading to patentable invention. It should be possible to re-construct on time scale from those records as to when the work related to the invention was conceived and actually started, when the inventive step was taken and when the result was first successfully demonstrated in the laboratory.

5.4.2 Data may be assembled, organized and analyzed, if necessary, and the results worked out as usual on the research/ experiment elucidating the steps/dates in the inventive process. Drawings may also be made and photographs taken, wherever necessary/appropriate, to effectively document the dates and claims of invention.

5.4.3 A copy of the representative information set of the data maintained in the concerned laboratories will be documented at the institutional/zonal/central database.

5.5 Screening/Scrutiny of Cases by the Institution

5.5.1 The ITMU/ZTMC will scrutinize and process the cases brought before it for filing of patent applications. The following points must be ascertained in the scrutiny:

1. The application is made in the Prescribed Form/ Performa/ Format.
2. The applicant named in the application is “Indian Council of Agricultural Research”.
3. The Innovation is assigned to “Indian Council of Agricultural Research”.
4. Names of all True and First Inventors are duly mentioned⁵¹ in the application.
5. Address for Service is mentioned in the application (Note: This will constitute Postal Address of the Director who will sign the application as Authorized Signatory of ICAR).
6. Other particulars/information are in conformity with the requirements of the patent law/ these guidelines/ other specific instructions as may be issued by ICAR from time to time.

5.5.2 ***Correction/ Rectification/ Updation of Primary Information.*** Any mistake/ anomaly/ discrepancy found in the scrutiny of the application shall be corrected/ rectified by the concerned PI/Inventor when informed to do so by the ITMU/ZTMC. Similarly, if before finalization of the patent document the PI/other inventors/innovators consider that some addition/amendment/deletion will add value to the patent application then the same will be done with the consent of ITMU/ZTMC.

5.6 Writing a Patent Document

5.6.1 The primary information collected as above shall be collated to prepare the patent application (patent document) for filing in the patent office. ITMU may hire the services of an empanelled patent attorney for preparing the patent document, particularly in the complete specification and claims⁵².

⁵¹ Including the relevant retirement and transfer cases, if any.

⁵² See Annexure 11, “Case File of a Granted ICAR Patent”.

5.6.2 All patent applications will be filed in duplicate in Form 1⁵³ and Form 2. The applicable fee for ICAR applications for patents will be that mentioned in the First Schedule of the Patents Act under the column “For other than natural person(s)”. The application fee can be paid at the time of filing the application or within one month of the date of filing. The application will be accompanied by the following.

1. Provisional or complete specification (in Form 2) and drawings (if any) in duplicate.
2. Statement/undertaking regarding foreign filing details in respect of same invention (in Form 3)
3. Declaration as to Inventorship (in Form 5) (e.g. in cases of convention applications, complete applications following the earlier filed provisional applications, etc.)
4. Priority document (Copy of the proof of filing date of provisional application if a complete application is to be filed following a provisional application for the same invention)
5. Proof of right: The declaration signed by the inventor(s) and two witnesses in Annexure to Form 1 assigning the invention to “Indian Council of Agricultural Research” will be the proof of right to file the patent application by ICAR, which must be complied with.

DECLARATION BY INVENTOR(S)

I/We _____ (Name(s) of Inventor(s) with Designation and Address) declare that all rights for the invention _____ (Title of Patent as given in the Application) _____ are assigned by me/us to the applicant “Indian Council of Agricultural Research (ICAR), Krishi Bhawan, 1, Dr. Rajendra Prasad Road, New Delhi – 110001.” and the application is signed on behalf of the assignee by the authorized official of ICAR.

Dated thisday of 20...

Inventor Name	Signatures

Witnesses (Two):

Name	Designation	Signatures
1.
2.

6. The patent application (Form 1) shall also essentially include the following information:
 - i. Mention of “Indian Council of Agricultural Research” in column 1 of Form 1 (to ensure that all applications are made by the ICAR institutions/zonal institutes in the name of the Council and not in their own name).
 - ii. Name(s) of True and First Inventor(s) in Form 1 (to ensure that all scientists/innovators responsible for the invention are recognized).
 - iii. Complete Address of the concerned ICAR institute filing the application in column 8 (to ensure that Address for Service is duly given).
 - iv. Signatures, Name (in brackets), Designation and complete Address of the Director/Project Director of the institution filing the application as per the delegation of powers by ICAR. Further delegation of the powers delegated to the Directors of the institutes, if required, may be done with prior approval of the competent authority/as per ICAR Rules⁵⁴.

5.6.3 **Strengths of a Patent Document.** The patent application should be such that it can stand successful scrutiny and examination in the patent office. The following questions may be appropriately addressed in the patent document:

⁵³ See Annexure 17; check before use for new version of Application Form, if any, under Patents Act

⁵⁴ Memorandum of Association: Rules and Bye-Laws of the Indian Council of Agricultural Research Society, 2000

1. Whether the information being given is sufficient for the patent examiner to understand the invention?
2. Whether “patentability of the subject matter” is discernible? Are the provisions of non-patentable subject matter (sections 3 and 4 of the Patents Act, 1970) clearly ruled out?
3. Whether the specifications meet the criteria of “sufficiency of disclosure”? Where a biological material (e.g. a genetically engineered microorganism) is used in the invention, is the referral sample of the same deposited in the international depository authority (IDA)⁵⁵?
4. Whether the claims clearly reflect “unity of invention”? Are the principal claim (First Claim) and subordinate claims (Subsequent Claims) properly worded and hierarchical?
5. Whether the appraisal of Industrial applicability of the invention is clearly made? (Industrial applicability includes commercial or non-commercial utility but it has nothing to do with commercial success).
6. Whether classification of the invention is made clear? This would be important from the viewpoint of prior art search. In case of ambiguity, expert opinion on patent classification should be obtained.
7. Whether result of the novelty search carried out has been mentioned/ elaborated if necessary?
8. Whether the disclosure made (in the specification) is appropriate in the determination of the inventive step?
9. Whether the validity of claims is discernible?

5.6.4 **ICAR Patent Guidelines.** For more details on writing the provisional and complete specification, claims, abstract, and preparing drawings, the ICAR guidelines for filing patent application as displayed on the ICAR web page <<http://www.icar.org.in/>> may be referred to together with the Manual of Patent Practice and Procedure 2005, published by the Indian Patent Office. The Manual is available on the Internet <<http://patentoffice.nic.in/>>.

5.7 Filing a Patent Application

5.7.1 **Filing a Provisional Application.** A provisional application will be filed by the ITMU/ZTMC to secure the Priority Date for the invention. This will be done at the earliest, with minimum loss of time between the meeting of ITMC/ZITMC and the date of filing. The following points may be observed by ITMU/ZTMC. The application will be filed at the patent office under whose jurisdiction the institute’ headquarters fall. State wise jurisdictions of the four patent offices in India are given below:

Territorial Jurisdiction of Indian Patent Offices

Patent Office	Territorial Jurisdiction (States and Union Territories)
Mumbai	Gujarat, Maharashtra, Madhya Pradesh, Goa, Chhatisgarh, Daman & Diu, Dadra & Nagar Haveli
Chennai	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Pondichery, Lakshadweep
Delhi	Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Rajasthan, Uttar Pradesh, Uttranchal, NCT of Delhi, Chandigarh.
Kolkata	Rest of India.

5.7.2 **Filing a Complete Application in India.** Complete applications will be filed on the recommendations (decisions) of the ITMC/ZITMC either directly or after the respective

⁵⁵ IMTECH, Chandigarh is the IDA in India under the Budapest Treaty.

provisional applications have been filed. The ITMU/ZTMC shall scrutinize the application. If there is scope for improvement with some external help, the same will be arranged by the concerned ITMU/ZTMC from the panel of patent attorneys. When the document is finalized, and it appears to be well in order, the Complete Application will be filed by the ITMU/ZTMC in the relevant patent office as per procedure under the patent law.

5.7.3 *Filing a Patent Application Abroad.* If a patent application is to be filed outside India, the concerned ITMU/ZTMC will approach ATMC at the ICAR headquarters and assign it the IP for further necessary action. The ATMC will take steps to file a PCT application or to directly file the application in a foreign country.

5.8 Types of Patent Applications (under the Patents Act, 1970)

5.8.1 *Ordinary/Standard Application.* It is the most common type of application filed for obtaining patents without making any reference to another application to claim priority. It may be made with provisional or complete specification.

5.8.2 *PCT International Application.* India is a member of the Patent Cooperation Treaty (PCT). Under this treaty, there is an international filing system for patents. It is a simple and economical procedure for seeking protection for the inventions in many countries. In this system, the applicant gains an international filing date in all the designated countries, and can confer late entry (up to 31 months) to the national offices without affecting the priority date. Indian Patent office is a receiving office for international applications under PCT by nationals or residents of India. A PCT international application may be filed in India as per law, either in English or in Hindi. However, a PCT International Application can also be filed in the World Intellectual Property Office (WIPO) in Geneva.

5.8.3 *PCT-National Phase Application.* It is not applicable for the PCT international applications filed by ICAR in India. However, for entering the national phase in other designated countries, separate applications will have to be made within 31 months from the filing of international application to claim the priority date in these countries under their respective patent laws. It is not mandatory for the applicant to submit all the documents while entering the national phase of individual countries as it is obligatory on the part of WIPO to send the published application along with search report, etc., to the designated offices. However, copies of original documents should be submitted for the sake of convenience and faster processing. Services of international patent attorneys and legal translators should be hired as per need.

5.8.4 *Application for Patent of Addition.* When ICAR is in possession of another invention, which is a slight modification on an invention for which patent application is already made or patent is already granted in India, the concerned institution may file an application for patent of addition. There is a benefit of seeking a patent of addition because there is no separate renewal fee for this patent during the term of the main patent. It can be made independent according to the provisions in the patent law during the term of the main patent; otherwise, it will expire along with the main patent. A specific reference to the main patent or the application for the main patent will have to be made in the complete specification of the application for patent of addition. Also, a definite statement must be provided in Form 1 that the invention comprises an improvement in, or a modification of the invention claimed in the specification of the main patent granted or applied for.

5.8.5 *Divisional Application.* When it is observed that a patent application made by ICAR claims more than one invention, the concerned institution may file divisional application so that separate applications are ultimately filed for separate inventions in the original application. The priority date for all the divisional applications from a single application will be same as that claimed by the original application. This is also called *Ante Dating*. The complete specification of the divisional application should not include any matter which has not been substantively disclosed in the complete specification of the first application. Also, the reference of parent application should be made in the body of the specification.

5.8.6 *Convention Application.* This is an application claiming priority under the Paris Convention from an application filed in another convention country after obtaining permission under section 39 of the Indian Patents Act. Normally, this type of patent application will not be applicable for ICAR but it is also not ruled out. This can be useful in exceptional cases for unpatentable or difficult to patent subject matter in India, which is patentable in other jurisdiction.

5.9 Patent Application under the Patent Cooperation Treaty (PCT)

5.9.1 ICAR institutions will assign the patentable inventions, which have scope for patenting/commercialization abroad, to ATMC at the ICAR headquarters. The ATMC will take up the necessary follow up action and file the PCT and subsequent national phase patent applications.

5.9.2 The institutions may normally assign the prospective patentable inventions to ATMC for filing the PCT/national phase applications, after the filing of Indian application in their respective jurisdictions. Nevertheless, the assignment may be made in the very first place for specific cases, with the approval of the competent authority.

5.9.3 The ZTMCs may also file PCT applications for ICAR inventions in specific cases on merit grounds and any specific justification, with the approval of the competent authority.

5.10 Direct Filing in a Foreign Country with Priority Date of an Indian Application

If it is considered appropriate to directly file a patent application in a foreign country, the invention should be assigned to ATMC or action should be taken at the level of ZTMCs, with the approval of the competent authority. All action for filing of patent application abroad should be taken up with suitable legal expertise.

5.11 Maintenance of Patents

5.11.1 The concerned ITMUs/ ZTMCs will maintain the patents obtained by them by paying the requisite fees at the respective patent offices. Initially, they will pay the renewal fees over a five years period and depending upon some headway in the process of technology transfer/commercialization they may renew the patent for any further period.

5.11.2 Maintenance of unlicensed patents in the IPR portfolio beyond a period of five years will be done on case-to-case basis, in consultation with ZTMC/ITMC. However, ATMC will be consulted before any decision is taken in the institution to discontinue the maintenance of an ICAR patent.

5.12 Patent Watch

5.12.1 A system of patent watch will be developed in ICAR. The mechanism will cover proactive monitoring/ watch for all ICAR patents that require to be protected or defended when challenged, by concerned ITMUs/ ZTMCs/ ATMC. This will be done primarily with in-house expertise and in special circumstances through outsourcing.

5.12.2 The ATMC will assist the ITMUs/ZTMCs in taking any preventive/ initial action with the assistance of legal and business experts/ patent managers. In cases where further legal action is required, approval of the competent authority at the ICAR headquarters will be obtained. Specific cases of larger interest to the national agricultural research and education system, if noticed, will be referred to the CTMC for seeking any case-specific advice.

Part - B

5.13 Patentability of Biological Inventions

5.13.1 Whereas all patent cases will be addressed only as per the patent law, the following provisions of the Indian Patents Act should be clearly understood.

5.13.2 According to section 3(i) of the Patents Act, “any process for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human being or any process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products” cannot be patented. In this context, prophylactic treatment such as vaccination, inoculation (prophylactic immuno-therapy) in animals is to be regarded as therapy, which includes treatment, and is not patentable. Patent may, however, be obtained for surgical therapeutic or diagnostic instruments or apparatus.

5.13.3 According to section 3(j) of the Patents Act, “plants and animals in whole or any part thereof other than microorganisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals, for example, clones and plant varieties” are not patentable. However, processes leading to the development of Genetically Modified Organisms (GMO) can constitute patentable subject matter.

5.13.4 Any clarification on the patentability of biotechnological inventions may be seen from the Manual of Patent Practice and Procedure 2005 of the Indian Patent Office (<<http://patentoffice.nic.in>>). The guiding points for the examination of patent applications by the patent examiners given in this manual could be helpful in a pre-judgment on the patentability of inventions in ICAR, before a patent application is to be filed. For example, the following points are noteworthy:

1. The living entities of natural origin such as animals, plants, in whole or any parts thereof, plant varieties, seeds, species, genes and microorganisms are not patentable.
2. Any process of manufacture or production relating to such living entities is also not patentable.
3. Any method of treatment such as medicinal, surgical, curative, prophylactic, diagnostic and therapeutic of animals or other treatments of similar nature are not patentable.
4. Any living entity of artificial origin such as transgenic animals and plants, any part thereof are not patentable.
5. The living entity of artificial origin such as microorganisms, vaccines are patentable.

6. The biological materials such as organs, tissues, cells, viruses etc. and process of preparing thereof are not patentable under Section 3(c).
7. The biological material such as recombinant DNA, Plasmids and processes of manufacturing thereof are patentable provided they are produced by substantive human intervention.
8. Gene sequences, DNA sequences without having disclosed their functions are not patentable for lack of inventive step and industrial application.
9. The processes relating to microorganisms or producing chemical substances using such microorganisms are patentable.
10. Essentially biological processes for the production of plants and animals such as method of crossing or breeding etc. are not patentable.
11. Any biological material and method of making the same which is capable of causing serious prejudice to human, animal or plant lives or health or to the environment including the use of those would be contrary to public order and morality are not patentable such as terminator gene technology.
12. The processes for cloning human beings or animals, processes for modifying the germ line, genetic identity of human beings or animals, uses of human or animal embryos for any purpose are not patentable as they are against public order and morality.
13. Any invention which in effect is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known components is not patentable.

5.13.5 Biological Material Used in the Invention. Specific attention will be given to the following points:

1. The source or geographical origin of biological material used in the invention disclosed in the patent application will be mentioned in the specification.
2. New biological materials used in the invention disclosed in the patent application are required to be deposited in any of the International Depositary Authorities (IDA) recognized under the Budapest Treaty on or before filing of the application, to supplement the description for sufficiency of disclosure of the invention. Reference of such a deposit has also to be made in the patent specification. As of now, there is only one recognized depository in India under Budapest Treaty. It is the Institute of Microbial Technology (IMTECH), Chandigarh, which receives specimens of certain microbial species only.
3. The reference samples deposited at the Genetic Resources Bureaus of ICAR will be helpful for internal reference only. However, in case of any litigation it is likely that the evidence in the form of such duly characterized and documented referral sample can be held valid at the discretion of a Court of Law. Therefore, all ICAR institutions must take individual initiative of depositing a referral sample at the respective National Bureaus for Plants, Animals, Fish and Microorganisms Genetic Resources before filing a patent for any invention based on biological material.

5.13.6 Patents on Value Addition. Patents can be secured on inventive steps irrespective of whether these steps are big or small. Therefore, patents can be obtained on incremental research results provided these qualify the patentability criteria, and have scope and worth.

5.14 Discovery versus Invention

According to section 3(c) of the Patents Act, “the mere discovery of a scientific principle or the formulation of an abstract theory [or discovery of any living thing or non-living substances occurring in nature]⁵⁶” is not patentable. In this context, the difference

⁵⁶ Inserted by in the Patents act, 1970 by the Patents (Amendment) Act, 2002 (38 of 2002), sec. 4 (w.e.f. 20.5.2003)

between discovery and invention as interpreted in the Indian Patent Office's Manual of Patent Practice and Procedure, 2005, is that a 'discovery' adds to the amount of human knowledge by disclosing something, which has not been seen before whereas an 'invention' adds to the human knowledge by suggesting an act, to be done. Only the latter is patentable.

5.15 Method of Agriculture or Horticulture

According to section 3(h) of the Patents Act, "a method of agriculture or horticulture" does not constitute patentable invention. Some specifically construed patent claims on processes and products related to agriculture and horticulture could be found in order for acceptance by the patent offices⁵⁷.

5.16 Monitoring

The monitoring and follow up activities on patenting/patents in ICAR will be undertaken on a regular basis. A monitoring system will be developed at the ITMUs/ZTMCs with the help of bioinformatics units at the ICAR institutions and linking the information built by them to the ATMC/ICAR headquarters.

⁵⁷ The Indian Patent Office did not grant patents on "A method for cultivation of an algae" (264/Cal/79) and "A method for producing mushroom plant or production of mushrooms" (445/Del/93) for the reasons that the production of mushrooms and cultivation of an algae are analogous to agriculture, since they belong to plant kingdom and therefore fall within the provisions of non patentability. These were held not patentable also for the reasons that the purpose of applicants' inventions was to achieve varying degree of growth promotion, increased output, improved quality which increases their economic value. On the other hand, an ICAR Patent No. 183679⁵⁷ dated 15 January 1998 on "A new bed for mushroom cultivation by utilizing biogas waste slurry and straw for improved mushroom cultivation" from National Institute for Research on Jute and Allied Fibre Technology, Kolkata, was granted. Thus, there is need to further explore more critically and judiciously, on a case-to-case basis, a legitimate securing of the IP contemplated.

Chapter 6

Procedures for Management of Plant Variety Protection

6.1 Introduction

This chapter describes the procedures for seeking and maintaining IPR protection of plant varieties developed in ICAR.

6.2 Plant Variety Protection

6.2.1 The IP protection of plant varieties of ICAR, including the extant varieties, will be secured under the PPV&FR Act. This in turn will enable a more rapid and effective transfer of plant varieties to the end users. However, a decision can be taken by the ICAR even after the plant variety protection (PVP) certificate has been obtained as to whether a particular variety will be transferred for commercial use through exclusive/ non-exclusive licences or it will be placed solely in public domain to meet some specific national need/situation. Where it is considered necessary in public interest to specifically promote some ICAR varieties for food and nutritional security or for diversifying agriculture, special steps will be taken as may be deemed fit by the competent authority.

6.2.2 Protection of all extant varieties of ICAR, which have not completed 15 years from the date of notification shall be taken up under the PPV&FR Act as a priority activity in a time-bound manner.

6.2.3 Registration and protection of plant varieties of field, horticultural and agroforestry crops, developed by ICAR institutions, which meet the essential criteria for their protection, will be obtained by them in the name of ICAR, under the PPV&FR Act. The period for which the PVP title of the protected varieties will be maintained will depend on the actual performance/ adoption of the variety. This will be periodically reviewed by the concerned ITMUs/ZTMCs and decided by the respective ITMCs/ZITMCs.

6.2.4 ICAR will maintain the IPR portfolio of its varieties/hybrids/transgenics in a transparent manner.

1. ICAR may file PVP applications for sole ownership over its plant varieties for (i) the varieties developed in ICAR institution(s)⁵⁸, (ii) the hybrids developed in ICAR where the parents of hybrid belong solely to ICAR, and (iii) the transgenics where the transgenic events are carried out in ICAR institution(s) and the initial variety and gene sequence(s)/events belong solely to ICAR.
2. ICAR may also file joint applications with others, such as, SAUs or other concerned organizations/institutions/research establishments in the public or private sector for varieties which have been developed through collaborative efforts.

⁵⁸ For the varieties developed in the breeding programmes of the institutions using their own pool of genetic stocks.

- i. Where it has been decided to file joint applications, the same will be taken up on mutually agreed terms between ICAR and the other collaborators/research partners
- ii. Where the collaborator(s)/research partner(s) assign a jointly developed plant variety to ICAR for protection and further management, ICAR will file the PVP application as sole applicant. However, it shall include the names of the research partners as the breeders of the candidate variety in the PVP application. In other cases, ICAR as well as the other collaborators jointly responsible for developing a plant variety will be the co-applicants. ICAR will share benefit accrued from commercialization of that variety with the collaborator(s)/research partner(s) on mutually agreed terms⁵⁹.
- iii. Where the collaborator/research partner is an international agency or a foreign client, and the variety/ hybrid/ transgenic is developed in ICAR, the ownership and the licensing rights will be determined on mutually agreed terms. The MOU with the collaborator/partner will be executed by ATMC at the ICAR headquarters. Other terms and conditions, and limitations of the MOU will be entered as per the mutual agreement.

6.2.5 As ICAR will be the institutional breeder and the applicant in the PVP application for each of the plant varieties developed in its set up, it will also consider/discharge any liability in respect of the following:

1. Benefit sharing as may be determined by the PVP Authority under section 26(5).
2. Compensation for under performance, if any, under section 39(2).
3. Any other liability that may be fixed by the PPV&FR Authority or the PVP Appellate Tribunal, or any court of law, under the PPV&FR Act.

6.3 Registration and Protection of Extant Varieties

6.3.1 **Extant Varieties.** As per the PPV&FR Act, an extant variety is the variety available in India which is either (i) notified under section 5 of the Seeds Act, 1966 (54 of 1966), or (ii) a farmers' variety, or (iii) a variety about which there is common knowledge, or (iv) any other variety which is in public domain. The following procedure may be followed for registration and protection of extant varieties of ICAR in relevant cases.

6.3.2 **Varieties Notified Under the Seeds Act, 1966.** ICAR will, on first priority, apply for the registration and protection under the PPV&FR Act of its extant varieties of different crops which are already notified under the Seeds Act, 1966 but have not completed 15 years from the date of notification. NBPGR will act as the Nodal Institute to facilitate this action.

6.3.3 ICAR institutions shall provide all the necessary information required under the PPV&FR Act/Rules for registration of extant varieties developed by them to NBPGR. This will include the particulars required for the National Register of Plant Varieties, such as the denomination of the variety, names of breeders⁶⁰ involved in its development, pedigree details, salient features of identity vis-à-vis most similar varieties, zone(s) of adaptation, performance limits under specified situations particularly for DUS traits, etc. along with a referral seed sample. NBPGR will further verify the database of extant varieties developed and maintained at the Bureau with the information received from different institutions and supplement the information with the molecular profile of the variety, if available.

6.3.4 Authenticated seed samples of the variety will also be deposited in the active and base collections at the national gene bank at NBPGR on immediate basis. Availability of adequate

⁵⁹ Sharing of commercial benefits accrued with the individual breeders of the collaborator/research partner will be generally done in the same proportion/manner as it will be done with the ICAR scientists recorded as breeders on the PVP application.

⁶⁰ Scientists belonging to any discipline/institution who have made principal contribution in the development of a variety.

quantity of nucleus/breeder seed will be simultaneously ensured. NBPGR will also ensure that the seed samples of all extant varieties are available with the Bureau for registration as well as conservation purposes.

6.3.5 At the earliest, NBPGR will take action so that proposal(s) for registration of all extant varieties of ICAR which have not completed 15 years from the date of their notification under the Seeds Act, 1966, are kept ready in all respects. Application(s) for registration and protection of these extant varieties shall be made soon after section 15(2)⁶¹ of the PPV&FR Act is enforced.

6.3.6 **Varieties of Common Knowledge.** In a specific case where there is common knowledge about a variety developed by ICAR which is not notified under the Seeds Act, 1966, or it is already in public domain, such matters will be brought before the competent authority at the ICAR headquarters for decision.

6.3.7 **Any Other Extant Variety.** For the extant varieties other than those described above, e.g. farmers' varieties or some varieties of common knowledge no direct role of ICAR is stipulated as per the PPV&FR Act⁶².

6.4 Registration and Protection of New Varieties/ Hybrids/ Essentially Derived Varieties

6.4.1 **Early Action by Breeders.** The Principal Investigator (PI)/ Plant Breeder will inform the respective ITMU/ZTMC at the institution about the availability of any prospective material developed by him/her which can qualify for a new, distinctive, uniform and stable crop variety as per the requirements of the PPV&FR Act.

1. The salient DUS particulars of the prospective varietal material along with name(s) of most similar varieties will be provided by the PI/Breeder.
2. In case of a hybrid, similar/appropriate information on parental lines shall also be provided by the PI/Breeder.
3. In case of transgenic variety, information will be provided with respect to the initial variety (and its parents), the gene sequences (including the promoters) and their source, and the transgenic events.
4. In case of seed propagated crops, the above early information will be given at least four months prior to the next crop season; after duly completing the harvest, seed processing and storage, appropriate statistical analysis and interpretation of results of the previous crop season. In case of vegetatively propagated crops like sugarcane such information will be given while the crop is still standing⁶³.

6.4.2 **Follow Up Action by Institutions.** The ITMUs/ZTMCs will prepare the crop-wise lists of prospective varieties of their respective institutions proposed by PIs/Breeders, and prepare schedule of assessment of these materials in the next crop season involving ITMC/ZITMC and other co-opted crop specialists from within or outside the institution.

⁶¹ Sec. 15. Registerable varieties:- (2) ... an extant variety shall be registered under this Act within a specified period if it conforms to such criteria of distinctiveness, uniformity and stability as shall be specified under the regulations.

⁶² ICAR will take suitable action in conformity with the PPV&FR Act/Biodiversity Act if required to advise/assist in the matter in public interest.

⁶³ ITMUs/ZTMCs of the concerned institutions will circulate the specific norms for their crops, if any, with the recommendations of their respective ITMCs/ZITMCs.

6.4.3 The ITMC/ZITMC will make necessary recommendations for follow up by the concerned scientist(s)/institution on the basis of the following:

1. Assessment of the potential varietal materials in the experimental plots as per given schedule.
2. Consideration of the performance data in station and cooperative trials in the previous years.
3. DUS parameters vis-à-vis the most similar varieties.
4. Some extraordinary or exceptional merit seen in the varietal material, if any, based on which it can be taken up for filing PVP application at an early date.

6.4.4 ITMC/ZITMC will also advise on the finalization of a suitable denomination for the deemed variety, which should be unambiguous and in conformity with the requirements of PVP law.

6.4.5 **Decision to File PVP Application.** Normally, the process of filing application for registration and protection of varietal materials recommended by the ITMC will be taken up by the concerned institution as soon as the variety has been identified in the AICRP workshop. Therefore, the basic information required for filing the PVP application as per the PPV&FR Act should be kept ready by the respective ITMUs in consultation with the concerned PIs/Breeders. ICAR will thus normally prefer filing its applications for variety protection only when there is satisfaction with respect to the outcome of value for cultivation and use (VCU) of identified varieties from the AICRP trials.

6.4.6 In exceptional cases, on a case-specific merit basis, early application can be filed by ICAR institutions for registration and protection of prospective varietal materials.

6.4.7 In case of new varieties and hybrids, PVP application will be filed under section 14 and that for the essentially derived varieties under section 23 of the PPV&FR Act.

6.4.8 **Nucleus and Breeder Seed.** The PI/Breeder will accord priority to the production/maintenance of nucleus seed of the prospective varietal material(s) reported to the ITMU/ZTMC as candidate varieties for PVP.

6.4.9 The concerned institutions shall take up production of breeder seed of prospective varieties, i.e., most promising varieties in advance varietal trials, one year prior to filing the application for their registration.

6.4.10 **Performance Limits.** All concerned breeders/scientists shall specifically provide the performance limits under each of the different environments/situations that are considered suitable for cultivation of the variety proposed for registration and protection under the PPV&FR Act. This would be necessary to avoid any uncalled for litigations/compensation for under-performance provided for in the PPV&FR Act.

6.4.11 **Maintenance of Seed/ Propagules of Protected Plant Varieties.** Concerned institutions/ breeders will be responsible for the maintenance of varietal purity, and will ensure the availability of breeder seed for public supply or commercial use, as applicable.

6.4.12 **Variety Registration and Protection.** Concerned ITMUs/ZTMCs will undertake and pursue the needed steps under the PPV&FR Act/PVP law required for seeking registration and protection of plant varieties.

6.4.13 **Maintenance of Title of Protection.** The ITMUs/ZTMCs will maintain the PVP titles secured by them by payment of requisite recurrent fees to the Registrar as per the PPV&FR Act. The ITMCs will undertake periodical reviews and decide on further the maintenance of titles by payment of requisite fees based on (i) actual performance of variety, (ii) further licensing potential of the variety in India or abroad, (iii) potential use of the variety for further variety development programme, or (iv) any other specific/relevant criteria considered appropriate for the purpose.

6.4.14 **Rectification of Register or Alteration of Denomination.** Application for rectification and correction of National Register of Plant Varieties can be made under section 37 and that for alteration of denomination, if required, under section 38 of PPV&FR Act. Action may be taken in the following manner:

1. Concerned scientists will bring all such cases to the ITMU/ZTMC, specifying reasons, and justification.
2. The ITMU/ZTMC will obtain approval of the ITMC/ZITMC on case-to-case basis and shall take further necessary action under the PPV&FR Act.

6.4.15 **Revocation of PVP Certificate.** Cases pertaining to surrender of certificate (section 33) or revocation of protection (section 34) on certain grounds will be brought with full justification to the ITMU/ZTMC who, in turn will take up the matter for suitable action under PPV&FR Act with the approval of competent authority.

6.5 Dispute Prevention and Settlement

6.5.1 In each ICAR institution, the ITMU/ZTMC will be address the following matters to avoid/settle any dispute/possible dispute.

1. Critically examine the ownership issues pertaining to the initial varieties, breeding materials, germplasm, landraces, farmer varieties, genes, events, processes used in the development of a variety/hybrid/transgenic variety. For this purpose the concerned PIs/breeders/scientists⁶⁴ shall maintain in their breeding programmes an inventory of genetic resources/stocks and other IP assets belonging to the institution/others.
2. Monitor unauthorized use of a protected variety and initiating necessary action, if needed, with the outside legal help or assistance from ZTMCs/ATMC.
3. Highlight the performance limits and ranges of performance of the protected varieties in specific situations/ conditions/ environments, particularly for DUS parameters. Concerned PIs/breeders/scientists shall build up and provide the necessary information.
4. Consider and discharge any liability as may be determined under the PPV&FR Act by the PVP Authority or the PVP Appellate Tribunal, or any court of law.

6.5.2 Mediation, reconciliation or arbitration, as appropriate, will be used as mode of dispute settlement. The arbitrator will be appointed by the Director General, ICAR.

⁶⁴ Scientists moving away from the institution on transfer or retirement shall hand over the inventory and the materials to the Head of the Division under intimation to the ITMU/ZTMC. They shall also inform in writing their contribution in the ongoing breeding programme where a direct contribution has been made by them and a prospective variety is likely to be produced in near future.

6.6 Farmers' Rights

All matters related to farmers' rights arising in the protection of plant varieties by ICAR will be taken up/ resolved as per the provisions of the PPV&FR Act.

6.7 IP Monitoring, Watch and Litigations

6.7.1 A mechanism of IP monitoring and watch will be developed. The ATMC may assist the ITMUs/ZTMCs and wholly or partially outsource the task of IP watch.

6.7.2 In the event of suspected infringement of a protected ICAR variety, the concerned institution(s) will take initial action at their own, or in consultation with the ZTMCs/ATMC.

6.7.3 All cases of litigations where ICAR is required to defend will be taken up by the concerned institutions that have protected/maintained the IP under the disputed case. Institutions will, if required, seek assistance of ATMC in the engagement of legal experts. In all cases the Institutions will notify and keep the ICAR headquarters informed of any such dispute.

6.7.4 In all cases of litigation where major stakes of ICAR are involved, ATMC will take up the matter with the assistance of empanelled experts or other competent experts on need basis.

Chapter 7

Procedures for Management of Other Forms of IP

7.1 Introduction

This chapter describes procedures for securing IPRs in forms other than patents and plant variety protection. Specific procedures with respect to copyright, trade marks, geographical indications, industrial design, and others are highlighted in parts A to E.

Part - A

7.2 Copyright Protection

7.2.1 Copyright protection will be sought in ICAR under the Copyright Act/copyright law.

7.2.2 **Recognition of Copyright.** Irrespective of whether the copyright has been registered under the copyright law or not, it subsists in any original literary work, including scientific publications, popular articles, and other published material; computer programme/ software database; audio/ video and multimedia products, websites, material on a CD-ROM, etc., of ICAR as well as individual works of all its scientists/innovators and other staff. Nevertheless, registration of copyright work under the Copyright Act will be its prima facie proof.

1. Copyright also subsists in translations, abridgements or compilations of other works. All these are also considered to be literary works.
2. The author of a translation, abridgement or compilation of copyright works will have separate copyright in his translated, abridged or compiled work provided that the consent of the original copyright holder had been obtained.
3. Right for adapting or performing the copyright work also subsists in the adaptation or performance, which is called "Related Right".
4. A breach of copyright would occur if the written description or any of its substantial part has been copied by someone without the permission of the author/institution.

7.2.3 **Expression of Copyright.** Ownership of copyright on a publication or any other copyright work as explained above may be expressed by merely putting the symbol "©". It is more appropriate to use the word copyright along with its symbol "©", the year of publication and the name of the author⁶⁵..

1. Expression of copyright may also be made by using such statements on body of the work as "All Rights Reserved", "Permission granted to reproduce for academic use only", "For reproduction of this document or any part thereof permission of Indian Council of Agricultural Research (ICAR), New Delhi must be obtained", etc.
2. In the cases of works which are updated from time to time, for example a web site or a database, the year of publication may be shown as a period from first publication until the

⁶⁵ For example, mention "Copyright © 2004, Indian Council of Agricultural Research (ICAR)" on a work so intended. Sometimes, the title of the work may also be given. In such cases, it is normally placed at the beginning of the copyright notice, for example, "Handbook of Agriculture. Copyright © 2006, Indian Council of Agricultural Research (ICAR)"

- most recent update, e.g. 2001-2006, or the date of first publication and that of the last update may be clearly expressed.
3. In case the copyright work can be broken up into several parts or pieces, then the copyright notice should appear on its each part.
 4. The following specific examples are given to cite the expression of copyright notice on any one of the mentioned copyright works:
 - i. On a book, only one copyright notice will be printed inside the title page as per customary practice.
 - ii. On leaflets, brochures, hand outs, etc. one copyright notice will be printed on each item.
 - iii. On web pages, copyright notice will be printed on every page.
 - iv. On CDs and cassettes, one copyright notice will be printed on each CD and cassette and also on any accompanying sleeve or booklet.
 - v. On photographs and designs, a copyright notice will be printed at the bottom or on the reverse of the photograph or the design work as appropriate.
 - vi. On manuscripts like invited lectures or keynote addresses, a single copyright notice on the front will be normally sufficient.
 5. It will be important to put date/year along with copyright notice. In cases of any ownership dispute or disputes for novelty (originality) of a work, the display of date may be a determining factor in establishing the claim.

7.2.4 Ownership and Claim of Copyright: ICAR/institutions or its scientists/staff will hold the copyright as per the following illustrations:

1. ICAR will own copyright over its regular publications and registered copyright works.
2. In cases of commissioned work, in the absence of any agreement to the contrary, the ICAR and/or the sponsoring agency/organization will jointly own the copyright.
3. ICAR scientists/innovators/other staff can claim their individual copyright, whether registered or not, over their creations/work published by them as per rules⁶⁶.

7.2.5 Copyright Registration. Any copyright registration shall be taken up as per the provisions of the Copyright Act. ICAR institutions and Scientist/staff will refer to the Copyright Act/Hand Book of Copyright Law for details of the procedure for filing of application, amount of fees to be paid for various purposes, and also forms to be filled for application and other copyright matters⁶⁷.

7.2.6 Enforcement of ICAR's Copyrights. A system of monitoring and watch will be evolved in ICAR with internal capabilities as well as outsourcing for legal experts to enforce its copyright cases as appropriate. The enforcement will include both economic right and moral right of ICAR over its works under the copyright law.

7.2.7 Using Other Party's Copyright Work in ICAR. Scientists/institutions using a copyright material will obtain permission of the owner(s) before using that work or its substantial part in their own work. Petty use of a copyright work is allowed without permission but it is better to acknowledge such use in the ICAR publications.

7.3 Copyright in Software, databases & CD-ROMS

7.3.1 Provisions of the Copyright Act. The following provisions may be of relevance/interest:

⁶⁶ Central Civil Services (Conduct) Rules.

⁶⁷ Soft copy of this Government of India publication is available at the Internet site www.education.nic.in/htmlweb/copyright.htm.

1. It is illegal to make or distribute copies of copyrighted software⁶⁸ without proper or specific authorization. Back-up copy purely as a temporary protection against loss, distribution or damage to the original copy is allowed as an exception.
2. Sale or hiring, or any offer for sale or hiring of any copy of the computer program without specific authorization of the copyright holder is prohibited.
3. A civil and criminal action may be instituted for injunction, actual damages (including infringer's profits) or statutory damages for infringement, etc. The Copyright Act (section 63 B) has provision of awarding heavy punishment as fine and/or jail for the copyright infringers.

7.3.2 *Secrecy of Registered Copyright Software.* It is desirable *to file only a small extract of the computer programme* rather than the full programme itself as the copyright document. Thus, the part of the computer programme which is not being filed would remain the trade secret of ICAR/institutions/scientists. This will ensure double protection that no person wrongfully obtains/utilizes the said programme.

7.3.3 *Safeguarding Revision in a Copyright Programme.* If any revision takes place throughout the programme, then it is adequate to deposit the first and last 25 pages of source code (language in which a program is written to achieve an object) plus the page containing the copyright notice. If the revision does not take place throughout the programme, then any 50 pages representative of revised material may be deposited.

7.3.4 *Securing Copyright on Software/ Databases/ CD-ROMs/ Video/ Audio/ Multimedia Products.* All ICAR software/databases/CD-ROMs/video/audio/multimedia products/ or source codes shall carry a copyright notice. ITMUs in consultation with ZTMCs or ATMC will decide whether to formally register a specific copyright with Copyright Office or not. If yes, further necessary action will be taken by the concerned ITMU as per the copyright law.

1. In case the soft copyright products are developed in collaboration with other organizations on mutually agreed terms, the concerned ICAR institutions will take appropriate authorization/assurance from the collaborators in the agreement with them that the material is not subject to any confidentiality agreement and does not infringe any copyright. In these agreements, collaborator should also indemnify ICAR in the event of any such infringements.
2. The ICAR scientists/other staff responsible for contributing to such products shall also themselves not violate any confidentiality obligations or copyright provisions.

⁶⁸ *Free software:* Broadly, free software is free to use and copy, free to distribute with or without modifications, free to distribute with or without fee, but Source Code must be available. Free software may be mainly categorized into two types, based on the type of redistribution licence (permissions) that accompanies the free software:

*Copylefted** free software: Redistributions, with or without modifications, must also be free. (*A *copyleft licence tries to give you more things you can do. A copyright licence tries to say more about things you cannot do. Typically copyrights take away freedoms; copyleft preserves them.*)

Non-copylefted free software: Redistribution, with or without modifications, with permission to add additional restrictions (e.g. A software company can compile the programme, with or without modifications, and distribute the executable file as a proprietary software product)

Public domain software is a special case of non-copylefted free software, which means that some copies or modified versions may not be free.

Freeware: This type of software is commonly used for packages, which permit redistribution but not modification. No Source Code is available, and these packages are not free software.

Shareware: Shareware is a software, which comes with permission for people to redistribute copies, but says that anyone who continues to use a copy is required to pay a licence fee.

Non-free: It involves the licensee to use the software, which has to be paid for. The source code is not given away.

3. **Software:** It may be declared by concerned ICAR institutions with the recommendations of ITMC and approval of competent authority in each of its copyright software or self contained programme making use of programmes (like VB, VB.Net etc.) and databases (in EXCEL, ACCESS, Oracle etc.) as to the intended form in which it may be used depending on its public/academic utility or commercial use.
4. **Websites:** All websites/web pages of ICAR maintained by its headquarters/institutions will have the copyright link in the ICAR Home Page <<http://www.icar.org.in>>. Full copyright statement will be pinned at the Home Page. The website will contain a notice that ICAR/institution has the copyright on all materials generated in ICAR/at the institute. Web Masters will ensure proper authorization and indemnity from the copyright owner of the outside material which appears on the website of ICAR/institutions.
5. **CD-ROMs:** For any ICAR technology product/software/database access and distribution on CD-ROMs, these CD-ROMs shall be copyrighted with a note that it shall be used for non-commercial purposes only; proper citation will be required and modification shall be prohibited. Permission to make digital or hard copies of part or all of the work for personal or classroom use will be granted without fee and without a formal request, provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and full citation on the first page.

Part - B

7.4 ICAR Trade Mark

7.4.1 Registration of Trade Marks (TM) will be sought under the Trade Marks Act.

7.4.2 ICAR will use a Trade Mark as its goodwill sign vis-à-vis IPR, for commercialization/marketing of ICAR products/ technologies. This will have a two-fold advantage. First, with the use of trade mark by ICAR and its licensees, marketing of the ICAR technology can be secured from unfair competition/trade practices through free ride. Secondly, by insisting upon use of its Trade Mark by licensees, ICAR will also emphasize on the product quality control of its technologies/ seeds/ propagules.

7.4.3 ICAR emblem is well established and in use for a long time. It may be registered as its Collective Mark under section 63 of the Trade Marks Act. The application may be accompanied by regulations governing the use of the collective mark, including the persons (institutions) authorized to use the mark, conditions for its use and any sanctions against its misuse.

7.4.4 ICAR institutions may further register other marks already used by them in good faith for long time, for example 'PUSA' by Indian Agricultural Research Institute or 'Arka' by Indian Institute of Horticultural Research. Such marks may be used as their respective trade marks along with the collective mark of ICAR. Institutions will also lay down condition before the licensees of ICAR technologies to essentially use the registered mark of ICAR/institution on the packing of its licensed seeds/products.

7.4.5 ICAR may also suitably evolve its trade marks regime over the time. It may explore registration of its trade marks as a series (section 15) or as associated trade marks (section 16) as provided in the Trade Marks Act. ATMC and ZTMCs may register such marks for further use and building up of portfolio/intellectual assets.

Part - C

7.5 Geographical Indications of Agricultural Goods

7.5.1 The GI Act governs the protection of agricultural goods indicated to specific geographical territories/regions. Geographical indications, as a distinct form of IP are not related to ownership/ usership interest to ICAR but can be of broader relevance.

7.5.2 Like trade mark, GI is a form of IPR used in product marketing, represented in words, figures, graphics, diagrammatic presentations or any specific combination of these indications, but it essentially governs a collective rather than individual right that represents a specific link between goods (whether agricultural, natural or manufactured goods) and place of their production.

7.5.3 GI is an indication that the good which is being commercialized under that indication has originated from a definite geographical territory either as agricultural produce (e.g. Nagpur orange) or natural produce such as from mining (e.g. Mussourie Rock Phosphate) or by manufacturing (production or processing or preparation e.g. *Banarasi saree* or some specific local brews of tribal areas or *Agre ka petha*) and it has a special quality or reputation or other characteristics attributable to that origin.

7.5.4 GI is the collective intellectual property of the entire community or society or organisation of the geographical region to which the good belongs. However, only the registered users can independently exploit the GI for commercial purposes. Therefore, appropriate promotion of GI registrations of important agricultural goods of specific territories will depend on both collective initiative of concerned potential beneficiaries and the government policy in notification of specific zones for particular goods.

7.5.6 GI as collective intellectual property of the community is not in the ICAR's IPR domain. The GI Act provides for the facilitator role by some other relevant bodies in the registration and protection of GIs. ICAR will not encroach upon their area domain. However, assistance and advice will be tendered when required in the technical assessment of the scientific grounds and market realities of certain agricultural GIs of specific national or regional interests.

7.5.7 The TRIPS Agreement has special protection of GI of certain categories like wines and spirits whereas the developing countries seek greater recognition for their agricultural and handicraft goods of interest in global trade. ICAR will appropriately assist Government of India for building the technical grounds in the negotiations favouring inclusion of GIs of agricultural goods of interest to India/ developing countries in the special protection category in the world trade order.

Part - D

7.6 Registration and Use of Designs in ICAR

7.6.1 ICAR may seek Design protection for technologies involving considerations of shape (like shape of moldboard plough), configuration (like hitched implements, mounted implements) and pattern (like straight type harrow or triangular hoe) under the Designs Act.

7.6.2 A design covers only features of shape, configuration, pattern, ornamentation or composition of lines or colors applied or applicable to an article by any industrial process. The features of the design in the complete article should appeal to and are judged solely by the eye. Thus, design protection is primarily of an aesthetic nature (showcase value) and it does not protect any technical or functional features of the article to which it is applied.

7.6.3 Any new farm machine or any process equipment in prototype stage can also be registered as design if considered suitable. Its further refinements shall be updated for the same design.

7.6.4 In order to be eligible for registration, a design must be new or original and not previously published in India or elsewhere before the date of application for registration. The word 'new or original' involves the idea of novelty either in the pattern, shape or ornament itself or in the way in which an old pattern, shape or ornament is to be applied to some special subject matter. Original in relation to a design, means originating from the author of such design, and includes the cases which though old in themselves are yet new in their application.

7.6.5 Design can also be protected in certain cases under the copyright law. For example, under section 13 (5) of the Copyright Act, design of a work of architecture (but not its method of construction) can be protected as copyright. Agricultural structures can be covered in this category.

Part - E

7.7 Other Forms of IP

7.7.1 For addressing any specific matters related to IP in any other form than those described in Part A to Part D, the ITMUs/ZTMCs will take case-specific decisions, and proceed as per the delegation of powers to ICAR institutions and the relevant IPR law, if appropriate. In case any further guidance, assistance, clarification etc., is required, they will consult the ZTMCs or ATMC on a case-to-case basis.

7.8 Monitoring and IP Watch

7.8.1 The ITMUs/ ZTMCs/ ATMC will evolve a system of IP monitoring and watch as per the guidelines. Whereas initial/preventive action may be taken at the level of institutions, litigation for IPR infringement cases, if required, will be initiated after necessary approval of the competent authority.

Chapter 8

Technology Transfer: Commercialization of IP/Technologies

8.1 Introduction

This chapter describes the procedures for technology transfer through commercialization. Part-A explains the instruments and procedures of technology transfer/commercialization, Part-B covers costs and pricing of technology, and Part-C deals with various aspects of technology licensing.

Part - A

8.2 Procedures for Technology Transfer/ Commercialization

8.2.1 *Central Database of IPR Enabled Technologies.* A central database of the IPR enabled technologies will be maintained at the ATMC. The concerned institutions/zonal institutes will make entries of all new cases in their respective datasets as soon as the process for their IPR protection is switched on. They shall communicate a data set to the ZTMC/ATMC for linking with the zonal/central database. They shall also update the status of IPR protection/ maintenance in the data set from time to time. The entire ICAR IP database will be suitably inter-linked through intranet at the earliest.

8.2.2 *Transfer of IPR Enabled Technologies.* Notwithstanding the fact that only a small proportion of protected IP generally meets with commercial success world-wide, the ATMC and ZTMCs/ ITMUs will make efforts for technology commercialization with the primary objective of technology transfer to end-users. Depending upon factors such as the nature of technology, public need or marketing prospects, scale of technology etc. a decision will be taken by the competent authority whether the technology will be placed in the public domain through open access, or it will be transferred to end-users through commercialization.

8.2.3 *Registration of Commercial Entities.* The ITMUs/ZTMCs/ATMC shall develop a system of registering industry/ enterprises/ cooperatives for technology transfer/commercialization of ICAR technologies.

1. Registration of area/discipline/zone-wise potential licensees from industry/ enterprises/ cooperatives will be undertaken by inviting applications through advertisement.
2. The registered entities will be informed of the IPR enabled technologies available from time to time for transfer through commercialization.
3. A nominal registration fee will be charged⁶⁹ and the registration renewed annually.

8.2.4 *Disclosure/Advertisement of IP Enabled ICAR Technologies.* Concerned ITMUs will disclose⁷⁰ the salient features of technology ready for commercialization. The technology

⁶⁹ A nominal registration fee will ensure the commercial entities a regular flow of information on the development of applied technologies in ICAR for commercial use.

⁷⁰ See Annexure 3; suggestive only

disclosure for commercialization will be made in a confidential agreement. The ITMUs shall supply the catalogue/ information⁷¹ to the registered agencies on the technology developed giving its details/ specifications and potential benefits. The ITMUs/ZTMCs/ATMC will also advertise the IP enabled ICAR technologies available for commercialization by suitable means. The IPR enabled ICAR technologies ready for transfer/commercialization will also be given publicity through web portals of federation/chamber of commerce, such as FICCI or CII and other organizations for wider reach to interested clients.

8.2.5 Commercializing IPR Enabled Technologies. The IPR enabled technologies will be transferred for commercial purposes with suitable understanding⁷²/agreement or contracts⁷³ with the concerned parties. Specific terms of licensing can be negotiable.

8.2.6 Commercialization will be undertaken either by ITMUs of the concerned institutions that have the requisite expertise and experience or the concerned ZTMCs/ATMC. Commercialization in foreign countries shall be undertaken by the ATMC.

Part – B

8.3 Cost and Pricing of Technology

8.3.1 Broadly, the worth⁷⁴ of an IPR enabled technology will be derived from the likely benefits that may accrue to its end-users. The worth can be best determined on the judgment of technical experts, producers of technology and business managers. There is no standard method or formula for assessing the worth of a technology. Costs and pricing in ICAR will be determined on a case-to-case basis.

8.3.2 The ICAR institutions will determine the licence fee and royalty and/or sale price of its IPR enabled technologies either on a fixed basis, through negotiations with the licensee, or through an open bidding process as appropriate. Expert opinion and judgment viewpoint together with the following points will be considered in determining the price/licence fee.

1. Cost of IPR protection and maintenance.
2. Cost of production and handling.
3. Other institutional costs as appropriate.

8.3.3 The ITMU may determine the licence fee and/or sale price of the technology at the institute level if it has the necessary in-house expertise and experience, it may seek assistance of ZTMC/ ATMC in the matter or may refer it to the ZTMC/ ATMC to undertake commercialization.

8.3.4 As no standard formulae are available or can be provided for all ICAR technologies and situations, the ITMC at the institute level will determine the licence fee and/or royalty taking into account the considerations of “what the market can bear”, cost factors and public

⁷¹ See Annexure 4; suggestive only

⁷² See Annexure 5 for MOU; suggestive only

⁷³ See Annexure 6 for MOA, suggestive only

⁷⁴ To determine/assess the worth of an IPR enabled technology or any know-how or in fixing its price, the following factors may also be worth a consideration, (i) expected adoption level and expected benefits accruing to the end-users, (ii) cost associated with scaling up and commercial product development, (iii) alternative competing sources (national and international), (iv) impact of technology on innovation market, (iv) end-users and socio-economic impacts of IP, etc.

interest issues, if any. The decision of the ITMC, based on holistic assessment and judgement will be final. If the matter has been referred to the ZTMC/ATMC, the same procedure will be followed there.

8.3.5 The life of an IPR enabled technology in the market will vary and so will its popularity and sales. The recurring royalties will be mainly based on these factors. Therefore, the modes of payment (licence fee and/or royalty) will be on mutually agreed terms with the licensee, and flexible/determined on a case-to-case basis rather than rigid. The terms of commercialization may also be revised over time.

8.3.6 In evolving the process, ATMC will also support studies for developing indicative models/case studies for valuation⁷⁵, costing and pricing of IPR enabled agricultural technologies of different fields. Suitable models/case studies can be published as reference material.

Part C

8.4 Licensing of IP

8.4.1 Licensing of IPR enabled ICAR technologies will encompass out-licensing. The framework for licensing will be developed/refined/evolved by ATMC/ ZTMCs/ ITMUs.

8.4.2 Licences will be case-specific non-exclusive or exclusive licences. Appropriate joint commercialization agreements would also be entered into.

8.4.3 Normally, non-exclusive licences will be executed for technologies such as inputs (e.g. bio-pesticides or bio-fertilizers) so that these can lead to their wider adoption and thereby maximize research benefits to farmers and other end users. For non-exclusive licences there will be flexibility in fixing the licence fee⁷⁶.

8.4.4 When a technology is licensed through an open tendering/bidding process it will normally be given to one licensee. But depending upon the licensee's manufacturing capacity and size of business, other interested parties from outside the territory of his business/interest may also be considered if the technology has to be rapidly and widely disseminated. Alternately, a sub-licencing clause will be incorporated, which may require the licensee to share a part of the licence fee and/or royalty from any sub-licences that he may enter into with that technology.

8.4.5 Exclusive licence will also be issued when (i) an IPR enabled ICAR technology is to be commercialized in countries abroad, and (ii) the technology is to be disseminated in difficult areas offering low incentives. As exclusive licences are preferential, commensurate licence fee and/or royalty will be negotiated and settled on mutually agreed terms with the licensee.

8.4.6 The duration for which ICAR will issue licences will also be negotiated with the licensee and settled on mutually agreed terms.

⁷⁵ Valuation of IPR enabled technologies will contribute to the determination of overall assets of ICAR.

⁷⁶ See Annexure 15, "IVRI Technologies ..." for an example of variable licence fee.

8.4.7 The ATMC will empanel professional consultants and agencies having the necessary experience and proven track record at the national and zonal levels as Licence Managers for licensing the IPR enabled ICAR technologies. Their services will be utilized as and when required by ATMC/ZTMCs/ITMUs.

8.4.8 Joint commercialization of IPR enabled ICAR technologies will be undertaken on mutually agreed terms with another commercial enterprise when a close scientific supervision of scaling up or product development is required or in any other appropriate situation.

8.5 Implementation of Licences

Transfer of IPR enabled technology by ATMC/ZTMCs/ITMUs and payments by the licensees will be in accordance with the terms and conditions, including the time limits recorded in the licensing contracts/ agreements⁷⁷. If required, the concerned scientists/ innovators will demonstrate the technology on lab scale to the licensee under a confidentiality agreement⁷⁸.

8.6 Use of ICAR knowledge/IP by Foreign Clients

In cases of use of ICAR knowledge base by foreign clients for research and/or commercial purposes, all issues relating to contracting, target domain, pricing, payment and ownership of intellectual property will be pre-determined in a Memorandum of Agreement (MOA) signed by ICAR and the foreign client. The terms and conditions, and limitations of the Agreement with prospective foreign client will be set/ negotiated by ATMC/ICAR headquarters. Wherever required Technology Managers/ Licence Managers or IP Consultants may be engaged. Approval of the competent authority in the ICAR shall be essential to proceed for any agreement with foreign clients for commercialization.

8.7 Monitoring and IP & Market Watch

A mechanism of monitoring the licensing/commercialization activities in ICAR will be developed. This mechanism will include IP and market watch with a view to safeguard ICAR interests and to bring further refinement in their approach to commercialization.

8.8 Socio-Economic Impact

The ATMC will arrange/assign case-specific studies to assess socio-economic impact of the commercialized IPR enabled ICAR technologies and any other know-how.

⁷⁷ See Annexure 6; suggestive only

⁷⁸ See Annexure 1; indicative

Chapter 9

Technology Transfer: Commercialization of Plant Varieties

9.1 Introduction

This chapter describes the procedures for improving access to plant varieties by end users. Based on national priorities and issues of food and nutritional security, ICAR may decide to place a plant variety solely in the public domain or else it may be licensed for commercial use on exclusive or non-exclusive basis. However, registration and protection of all protectable varieties will be ensured under the PPV&FR Act before placing them in public or commercial domain.

9.2 Commercialization of Plant Varieties

9.2.1 *General Considerations.* For commercialization of plant varieties broadly the general guidelines for technology transfer/ commercialization of IP enabled ICAR technologies described in Chapter 8 may be followed.

9.2.2 *Specific Considerations.* ICAR will make the specific considerations⁷⁹ in the commercialization of its plant varieties as they can have direct impact on issues of food and nutritional security and farm incomes.

9.2.3 *Other Considerations.* All the registered varieties will be transferred for cultivation and use through open access or commercialization. No plant variety will be transferred/ commercialized before its registration and protection under the PPV&FR Act.

1. ICAR may consider any appropriate proposal for the grant of exclusive licence to a private seed company or public seed agency for commercialization of its protected plant variety abroad. All such varieties of ICAR which have commercialization potential abroad, shall be assigned to ATMC and licensed under suitable arrangements/ agreement keeping in view the interest of Indian farmers and national priorities.
2. Advance breeding material or parental lines shall not be transferred/ licensed on exclusive basis. These will first be registered with NBPGR before any material transfer/licensing agreement is to be negotiated/ entered into.
3. Normally, commercialization of an ICAR variety will be done by the same institution/ zonal institute that has secured the PVP title. However, where more than one ICAR institutions are involved/interested in the commercialization of the same variety, or where they are given this specific responsibility in public interest by the ICAR, these institutions will mutually settle the sharing arrangements.

⁷⁹ ICAR plant varieties will be commercialized in a manner that their quality seed is available to farmers of respective areas of varietal adaptability through local/regional multiplication and sales. To achieve this, ICAR will grant non-exclusive licences to all interested licensees from private, public or non governmental sectors or the farmers' cooperative that may have capabilities for quality seed production and distribution/sale. The commercialization approach will be compatible with the PVP&FR Act/Seeds Act/Biodiversity Act. It will be made obligatory on the part of all licensees that they use the variety denomination registered by ICAR under the PVP&FR Act. They will also be obliged to maintain the seed quality/purity; and use ICAR collective mark/trademark on seed packets/bags. To this effect, these points will be expressly mentioned in the licensing contracts. The licensees, subject to their fulfilling the above terms and conditions of licence, will also be free to use their own trademark/trade name for the seed/propagule of the ICAR plant varieties commercialized by them.

4. ICAR institutions will obtain assistance/advice of ATMC/ ZTMC, if needed, particularly for any legal opinion or market information.
5. The parametric values of all successful licences will be recorded in the institutional/ zonal/ central databases.
6. ATMC will evolve a suitable mechanism for quick disposal of plant variety licensing cases at different levels in ICAR.

9.3 Licensing of Seed and Planting Material

9.3.1 **Licensing.** As the ICAR technologies like seed and planting/propagating material have direct impact on the productivity and production in agriculture, their transfer on priority through licensing to various seed producers and distributors shall be facilitated.

9.3.2 **Non-Exclusive Licences.** ICAR will provide commercial licences, preferably non-exclusive licences, for the commercialization of seed/planting material of registered and protected ICAR varieties⁸⁰ to any interested party such as the following.

1. Central and State Departments of Agriculture on national/state basis for wide dissemination, popularization and public distribution of seeds/propagules for development and cooperation.
2. Public Seed Agencies – Central and State Seed Corporations for multiplication and distribution widely.
3. Private/Cooperative seed producers on regional basis for encouraging local multiplication and promoting use of specific varieties.
4. Other contracting parties including foreign clients in seed business who may be interested in commercializing ICAR seed/propagules in other countries. The terms and conditions of the licence will include, among other things, securing protection of ICAR varieties in the respective countries by the foreign client.

9.3.3 **Exclusive Licences.** Exclusive licences⁸¹ may be given after negotiations and on mutually agreed terms. In the licence agreement for an exclusive licence, a sub-licensing clause will be negotiated/incorporated so that a part of the licence fee and/or royalty from sub-licences given by the licensee is provided to ICAR. Also, negotiation will be undertaken for a time-line for re-negotiation of the licence, if needed, which will be recorded in the agreement.

9.3.4 **Compulsory Denomination.** The ICAR seed and planting/propagating material shall be licensed under only the registered denomination. The licensee will be required to print the same denomination on the label and to sell the seed/planting material essentially under that denomination. Subsequently, it shall also not be changed by the licensee or by any third party with whom the licensee deals with in that seed.

9.3.5 **Use of ICAR Mark.** Along with the use of registered denomination, all licence holders shall be required to use ICAR's Collective Mark/Trade Mark on all packets of seed/propagules of the licensed seed. In this context if the licensee is interested to simultaneously use its own trade name in the licensed seed, the same can also be agreed to.

⁸⁰ This includes registered parental lines of hybrids.

⁸¹ Inclusive licenses for commercialization of ICAR varieties in difficult areas or in foreign countries will be considered on priority.

9.3.6 **Seed Quality Assurance.** ICAR would provide breeder seed and will lay down the condition before the licensee to maintain the seed quality and purity. However, it will not be held responsible for the quality of subsequent lots produced and sold by the licensee. Thus, the agreement with the licensee shall also have the following clauses:

1. Assurance clause that the licensee will maintain the seed quality and genetic purity of the plant variety licensed by ICAR.
2. Disclaimer clause that ICAR will not be held responsible for the seed quality/purity of the subsequent lots commercialized by the licensee.
3. Indemnity clause that the licensee indemnifies the licensor ICAR from any legal consequences of his deals in subsequent lots of licensed seed/propagules .

9.3.7 **Joint Ownership Cases.** Varieties for which ICAR has joint ownership with SAUs or others, the joint owner will be given the first priority to use the variety for commercial purposes on mutually agreed terms. In the absence of any such request for a reasonable time period (6 months from grant of PVP title on the variety), the ICAR institution may award a non-exclusive licence to any other contracting party including in the territory of business interest of the joint owner for dissemination of seed to the farmers of that area.

9.4 Breeder Seed

9.4.1 Depending upon the terms and conditions of the licence agreement breeder seed will be supplied by concerned institutions only once or recurrently. Subsequent agreement may also be made with the licensee for making fresh supply of breeder seed.

9.4.2 ICAR shall maintain seed purity and health of all their released/registered varieties. Concerned ICAR institution(s) and breeder(s) will maintain and supply the breeder seed of respective registered and protected plant varieties as per licence agreements.

9.4.3 Breeder seed will be provided to the licensees under the terms and conditions that the licensee (seed agency/company producing commercial seed of ICAR varieties) will be responsible and liable for maintaining genetic purity of the seed/propagule and seed quality during the entire term of licence and the licensor will not bear any liability for spurious seed.

1. ICAR shall have the right to monitor seed genetic purity of the licensee's seed lots at the cost of the licensee, which will be recorded in the licensing contract.
2. ICAR may provide consultancies on request to the licensees for technical opinion/ assistance/ advice to maintain the genetic purity and seed quality of seed/other propagules.

9.4.4 It will be clearly mentioned in the licensing contract as to whether the breeder seed will be given to the licensee on one time basis or on annual basis or on recurrent basis with defined periodicity. The quantity of breeder seed⁸² to be given in each case/situation will also be mentioned.

9.4.5 A clause will be included in the licence agreement to the effect that no plant variety licence will be valid unless the licensee agrees to produce and distribute/sell quality seed in

⁸² The usual indent based method of breeder seed supply through Seed Division, Department of Agriculture and Cooperation (DAC) may have to be reviewed and made compatible with the system of licensing. The information on the supply of breeder seed in terms of quantities supplied, the licensees to whom supplied, and the places where supplied will be recorded in the institutional/zonal/central database. Another set of such information will also be given to DAC/PPV&FR Authority for statistical records.

the respective zone mentioned in the licence agreement on a regular basis “in sufficient quantities and at a reasonable price”⁸³.

9.4.6 ICAR will use various ways and means to further provide the breeder seed of its licensed varieties in case of any Compulsory Licensing under the PVP law.

9.4.7 Breeder seed of jointly owned plant varieties will be produced, maintained and supplied as per mutually agreed terms between ICAR and the other co-owners of the variety.

9.5 Licence Fee/Sale Price of Breeder Seed and Royalty

9.5.1 The concerned ICAR institutions will determine the licence fee and royalty and/or sale price of breeder seed either on a fixed basis, through negotiations with the licensee, or through an open bidding process as appropriate. Expert opinion and judgment together with the following points will be considered to fix the price/licence fee.

1. Cost of seeking and maintaining the plant variety right of the variety to be licensed.
2. Cost of production, handling and supply of breeder seed.
3. Other institutional costs as appropriate.

9.5.2 The ITMUs/ZTMCs may determine the licence fee and/or sale price of the breeder seed at the institute level with the necessary in-house expertise/experience or they may seek assistance from the ATMC.

9.5.3 As no standard formulae are available or can be provided for all crops, categories and situations, the ITMC at the institute level will determine the licence fee and/ or sale price of the variety taking into account issues of food and nutritional security, if any, the considerations of “what the market can bear” and cost factors mentioned above in this section. The decision of the ITMC, based on holistic assessment and judgement will be final. If the matter has been referred to the ZTMC/ ATMC, the same procedure will be followed there.

9.5.4 For evolving the system of licensing of plant varieties, ATMC/ZTMCs with the help of crop-specific institutions and outside experts, will develop and disseminate model agreements/case studies of different sizes and dimensions for reference purposes.

9.6 Research Exemption and Benefit Sharing

9.6.1 There will be exemption for research use of all registered and protected plant varieties and registered genetic stocks of ICAR.

9.6.2 Within ICAR, all institutions shall register their elite parental genetic stocks at NBPGR. They will transfer all plant genetic material under MTA through the Bureau; and also deposit a referral seed sample along with passport data set at the National Gene Bank as a pre-requisite.

9.6.3 ICAR will not impose any royalty payment for such breeding material maintained by private seed companies without registration and protection under the PPV&FR Act as is developed/derived from genetic stocks of ICAR institutions. However, it would be expected

⁸³ Sufficient quantities and reasonable price conditions may be subjective only, which will be subject to any relevant public interest notification by GOI from time to time.

that the concerned seed company shares the commercial benefits accrued using these breeding materials⁸⁴.

9.6.4 Condition of any royalty payment will also not be imposed for materials used in All India Coordinated Research Projects/ Network Projects by SAUs and other partners with whom ICAR has standing MOUs. Rather, such cases will be addressed/settled on mutually agreed terms.

9.6.5 In accordance with the provisions of the PPV&FR Act, ICAR may charge a royalty on seed sale of a protected variety which is developed by another agency/ company/ breeder by using its genetic material, which will be recurrently required for the commercial production of the protected variety.

9.6.7 ICAR will consider/discharge any liability of benefit sharing that may be fixed by the PPV&FR Authority under section 26(5) of the Act. Concerned ITMUs/ZTMCs shall verify the relevant facts and make a detailed case to ATMC for the consideration/approval of the competent authority.

9.7 Records and Confidential Information

9.7.1 Standard records of genetic stocks at the institution along with confidential records (codes) where applicable shall be maintained in signed and countersigned notebooks/ registers. Suitable data sets will also be documented in the institutional/zonal/central database.

9.7.2 All confidential information, such as codes, etc., will be kept safely and would not be revealed by individuals/institutions except through confidentiality agreements⁸⁵ which will expressly mention the purpose for sharing such information and other terms and conditions.

9.8 Infringements

Concerned breeders/ other ICAR scientists will report all matters of infringement/ suspected infringement of plant variety rights in their knowledge to the respective ITMUs/ ZTMCs/ ATMC as appropriate. Concerned ITMUs/ZTMCs will handle the cases reported to them or other apprehended cases either on their own or with the assistance of ATMC. Further legal action, if required will be taken with the approval of competent authority.

9.9 Monitoring and IP/Market Watch

The commercialization of plant variety portfolio will be monitored by ITMUs/ ZTMCs/ATMC. The relevant developments/ matters of concern, etc. will be critically observed and addressed. ATMC/ZTMCs will develop a mechanism of market watch.

9.10 Socio-Economic Impact

ATMC will plan/organize/assign suitable impact assessment studies on socio-economic impact of the commercialized plant varieties/hybrids of ICAR in different crops and regions of the country.

⁸⁴ The terms of MTA signed at the time of supply of germplasm/genetic stocks will include benefit sharing from the commercial use of the material or its derivatives.

⁸⁵ See Annexure 1; indicative

Chapter 10

Public-Private Partnership

10.1 Introduction

This chapter describes the mechanisms and manner of transferring IPR enabled ICAR technologies and other know-how to end users through commercialization.

10.2 Scope and Areas of Partnership

The partnership between ICAR and “for-profit”⁸⁶ and “not-for-profit”⁸⁷ private sector organizations will be in all fields of agricultural technology⁸⁸ on mutually agreed terms. The scope of public-private partnership will broadly include the following.

1. Dissemination of IPR enabled agricultural technologies.
2. Joint validation of technologies.
3. Up-gradation/incubation/up-scaling for product development/transfer⁸⁹ of technologies.
4. Mechanization of production technologies.
5. Cost-effective quality production.
6. Joint exploration of local and global markets for requisite demand
7. Test marketing of new products and market development.
8. Facilitating access to foreign technology
9. Training, consultancies, collaborations⁹⁰, contracts, education etc., in mutually identified areas.
10. Annual ICAR-Industry Meet which may be further evolved area-wise and discipline-wise.
11. Identification of other relevant areas of partnership⁹¹.

10.3 Mechanisms of Partnership

10.3.1 *Partnership on Mutually Agreed Terms.* ICAR/institutions will transfer/accord access to its IPR enabled technologies to private sector in the following manner.

1. Identification of areas of partnership with mutual agreement.
2. Negotiating and entering into relevant agreements with potential partners/ collaborators.
3. Clearly defining the terms and conditions and limitations, if any, and other relevant points of mutual concern in the respective agreements, such as the following.
 - i. Time-lines for each activity/area of cooperation/collaboration for each party.
 - ii. Provision for mid term review, if any.
 - iii. Disclaimers.

⁸⁶ E.g. the commercial entities.

⁸⁷ E.g. cooperatives, voluntary organizations, NGOs, foundations, trusts, etc.

⁸⁸ E.g. in (i) Diagnostics and Vaccines, (ii) Processing and Value Addition, (iii) Farm Implements and Machinery, (iv) Seed and Planting Material, (iv) Bioagents for efficient and productive farming systems in crops and animals, etc. The scope also covers sharing of core research facilities at ICAR institutions in specific cases, subject to their terms and conditions.

⁸⁹ E.g. in food processing or post harvest management methods; biopesticide formulations, etc.

⁹⁰ E.g. transgenics for pigeonpea and chickpea having resistance against pod borer; protocols for captive broodstock development of shrimp, etc. This may involve networks of ICAR institutions, private R&D organizations, and other suitable research partners.

⁹¹ E.g. representations on each other’s Boards of Management, Scientist Entrepreneurship, etc.

- iv. Indemnity.
 - v. Dispute prevention and settlement (Mediation, Reconciliation and Arbitration).
 - vi. Cost of management of the Agreement/Contract, etc.
4. Executing the partnership deals with the application of relevant tools like material transfer agreement⁹², confidentiality agreement⁹³, cooperative research agreement, licence agreement/contract, etc., at appropriate steps.

10.3.2 IP Ownership and Licensing Rights. In all agreements with private sector, ICAR will negotiate to arrive at the mutually agreed terms in respect of IP ownership and licensing rights broadly in the following manner.

1. ICAR may not claim any IPR over the protectable IP generated in any validation of technology of the private sector.
2. ICAR will claim IPR over the protectable research results generated from sponsored research where the sponsor has not given any scientific/ technical input and no mutually agreed terms are on record. ICAR will also hold the right to licence the IP thus generated.
3. ICAR will give its private partners priority opportunity to seek preferential licence if they so desire. However, a time limit (6 months) will be fixed to wait for any concrete proposal or response from that partner. The time period will be extended for some more time (3 months), if needed, to allow the partner to complete some formalities. Otherwise, the technology may be transferred through other contenders so that it reaches farmers/end users without much delay.
4. Other related/relevant points of mutual agreement, such as, sharing of other benefits, other relevant concerns, etc., if any, will also be negotiated and the mutually agreed terms incorporated in the agreements/contracts/deeds.

10.3.3 Access to be in Conformity with National Laws. ICAR/ institutions will provide access to the private sector to its IPR enabled technologies for transfer to farmers/end users through commercial route, only in conformity with the provisions of the relevant national Acts like the Biodiversity Act⁹⁴, the PPV&FR Act⁹⁵, etc.

10.3.4 Transparency in Providing Access. ICAR will maintain transparency in providing access to its IPR enabled technologies to the private sector under mutually agreed terms. The relevant agreements will also address the sharing of other benefits, continued IP protection in case of incremental research, obligation to label and maintain quality, warranties and disclaimers, indemnity, and other specific issues/concerns.

10.3.5 Sharing Core Research Facilities. ICAR will consider specific requests by the private R&D establishments in the country for sharing with them its core research facilities. The facilities will be shared only when these are sparable. ICAR will charge rent for the use of its facilities/equipment, which may be fixed on the basis of institutional and overhead considerations and cost of the facilities. ICAR may also consider requests from private sector e.g. trusts for donating/creating/ maintaining some core research facilities at the ICAR institutions. In such case, a preferential sharing of these facilities with the donors/private funding agencies will be done as per the terms and conditions of the MOU signed with them.

⁹² See Annexure 2; indicative

⁹³ See Annexure 1; indicative

⁹⁴ See Chapter II of the Biodiversity Act on 'Regulation of Access to Biological Diversity'.

⁹⁵ In case any plant variety/essentially derived variety has been developed, registered and commercialized by a private entity, which has used an ICAR variety as a patent/initial variety, then the said private entity will be obliged to share a part of the commercial benefit accrued with ICAR under the provisions of the PPV&FR Act.

10.3.6 **Consultancy.** ICAR will allow its scientists/concerned staff to accept consultancy assignment in the private sector in their respective areas of expertise. Such permission will be granted in accordance with the prevailing ICAR rules governing consultancy⁹⁶.

10.3.7 **ICAR Students as Interns in Private Sector.** Post graduate students at deemed universities and institutions of ICAR may undertake internships in various areas of specialization in the private sector.

10.3.8 **Student Interns in ICAR.** ICAR institutions will permit students from universities/law institutes/ agribusiness schools to intern with them on a case-to-case basis. Students may avail internships of 2 to 3 months during semester breaks. Prior requests should be made with the recommendation of their university/ institute/ college. Students would be given a certificate for assisting in the ongoing ICAR projects.

10.3.9 **Scholar Entrepreneurs.** Any Ph.D. scholars from a deemed university/institution of ICAR may contribute to the development of an IPR enabled ICAR technology, which has potential for commercialization. There may be few instances where the scholar is interested to venture on that IP but his/her degree work is not finished yet. In such cases, ICAR will suitably consider any request from them to proceed under leave from study.

10.3.10 **Deputation of ICAR Scientists/ Innovators to Industry.** ICAR will consider deputing its scientists/ innovators to the industry/ enterprise for up-scaling or refining its IPR enabled technologies that have been licensed to the particular industry/enterprise. This may be done under a tripartite Agreement on mutually agreed terms between ICAR, the concerned enterprise, and the scientist/innovator.

10.3.11 **Scientist/Innovator Entrepreneurship.** Some ICAR scientists/innovators who have generated an IP in ICAR on which IPR has been already secured, may be interested in a commercial venture with these IPR enabled technologies. Keeping in view that commercial product development, validation and/or quality control of bench-scale technologies may require expert input, the participation of scientist/innovator could enhance the scope of transfer of that technology. Therefore, ICAR may grant case-specific permission for the entrepreneurship. The individual cases will be processed in the following manner.

1. The scientist/innovator shall proceed for the entrepreneurship on Extra Ordinary Leave (EOL) along with a non-exclusive license of the IPR enabled ICAR technology developed by him/her.
2. A maximum of 3 years EOL will be permitted on the analogy of CSIR Scheme vis-à-vis the Ministry of Finance (Department of Expenditure) Office Memorandum No. 11(1)-E.II(B)/69 Dated 25th June 1970. No Earned Leave or Half Pay Commuted leave will be pre-fixed/suffixed. The period of EOL will not be count towards annual increments or any mandatory period required for promotion.
3. ICAR will not provide any financial assistance for the setting up of the enterprise.
4. It is essential that the scientist has a financial stake in the enterprise and will not be a mere employee. However, he/she may draw the salary as an employee of the enterprise also.

⁹⁶ Training, Consultancy, Contract Research and Contract services in ICAR: Rules and Guidelines, 1997 (Based on the Johl Committee Report)

5. During the period of EOL pension/employer's share of contribution as applicable, is to be paid to ICAR by the scientist/innovator as payable under the provisions of fundamental rules by Government Servant sent on deputation on foreign service.
6. The applicant will sign an affidavit accepting the following conditions:
 - i. The period of leave shall be used for commercialization of the technology under reference.
 - ii. If appropriate, ICAR may license the same technology to other interested licensees as well.
 - iii. The scientist/innovator may use ICAR's core shared facilities subject to availability and by making payment of rentals⁹⁷ as may be fixed by ICAR. The decision of ICAR to allow use of particular core shared facilities/equipment and rentals thereof will be final and binding on the scientist.
 - iv. The scientist/innovator shall furnish a half-yearly progress report during the leave period and a final report on the commercial status/progress of the technology at the end of the leave period to ICAR irrespective of whether he/she decides to quit or rejoin ICAR.
7. The scientist/entrepreneur will be entitled to avail the medical facilities provided he/she continues to make payment of the subscription as applicable.
8. Except for charging a nominal license fee for the non-exclusive license and rentals for using core shared facilities, if applicable, ICAR will not claim any ownership and licensing right in any new IP generated nor a share from commercial proceeds in the entrepreneurship.
9. The scientist entrepreneur will keep a liaison with the concerned ICAR institution/ATMC in the leave period and comply with the requirements of the affidavit furnished.
10. At the end of the leave period, the scientist/innovator may either resign from his/her job in ICAR so as to further pursue the enterprise or rejoin ICAR or his/her lien will be terminated. However, he/she must furnish final report on the status of the technology/commercialization.
11. At any time prior to the completion of EOL period, the scientist/entrepreneur may rejoin ICAR by giving a 3 months prior notice and submitting a detailed debriefing report within one month of his/her rejoining, giving details of experiences, difficulties faced, if any, success and failures, reasons for rejoining, etc.

10.3.12 ICAR Scientists as Board Members in Private R&D Entities. ICAR will consider specific requests from private sector/industry and may allow its scientists to be on the Board of Directors of private R&D entities⁹⁸. Such arrangement will be made with due approval of the competent authority in ICAR headquarters. A tripartite confidentiality agreement⁹⁹ among ICAR, the private R&D entity and the scientist concerned will also be entered into.

10.4 Agro-Technology Management Centre (ATMC)

10.4.1 ICAR will establish an Agro-Technology Management Centre (ATMC) at the ICAR headquarters for IP management and technology transfer/ commercialization.

10.4.2 The ATMC will function as the central hub for the management of IPR portfolio and commercialization of IPR enabled technologies of ICAR acquired from its institutions through assignment. It will function as an independent arm of the ICAR for the management of the IP related day-to-day business.

10.4.3 The ATMC will also serve as Secretariat to CTMC at ICAR headquarters and will be responsible and accountable to the CTMC in all IP and commercialization matters.

⁹⁷ Cost-plus rentals may be charged by ICAR as per existing guidelines (Johl Committee Report).

⁹⁸ ICAR already has representatives from Private Sector in its/institutions' management bodies.

⁹⁹ See Footnote 1

10.4.4 Organizational Arrangement

1. The ATMC will be headed by a business professional designated as Chief Executive Officer (CEO) with requisite knowledge of issues related to IPR portfolio management and commercialization of IPR enabled technologies.
2. The CEO will be initially supported by a core staff of six experts from different disciplines, including a research manager, an IPR manager, a business manager, an economist, and a law expert. A minimal administrative, technical and support staff will also be deployed. Later, depending on the nature and volume of work generated, ATMC staff may be increased.
3. The Centre will have the flexibility to engage consultants or outsource tasks related to patent and licence management, legal advice and litigation. It will maintain a panel of legal experts and other professionals necessary for providing advice to the zonal and institute level centres/ units.

10.4.5 *Functions of the ATMC.* The ATMC will undertake all such activities as may contribute to improved management of IP and spread of IPR enabled technologies in an effective and efficient manner. The following indicative functions of ATMC are listed.

1. To develop and evolve mechanism for the disclosure of IP generated in ICAR, its assignment for commercialization, valuation, pricing, licensing, patent/IP watch, market watch, and preventive and legal action to safeguard/defend the IP.
2. To seek IPR protection for the IP generated in ICAR which is protectable and worth protecting, and to maintain the IPR titles under the law.
3. To explore commercialization/licensing of IP generated in ICAR and its know-how in India and abroad; to suitably negotiate, enter into licensing contracts, and do the necessary follow up.
4. To develop database¹⁰⁰/e-connectivity/intranet that may also help in facilitating the negotiations for IP licensing.
5. To provide need based guidance/assistance for capacity building to ICAR institutes and potential clients. This would include arranging to provide technical assistance, training, assistance in negotiations, and other related assistance in order to enhance capabilities of ICAR institutions and also that of clients/ potential licensees in IPR management.
6. To facilitate research collaboration. To liaise and promote interaction among ICAR institutions/ scientists and potential clients for exploring the opportunities to jointly address researchable issues to meet the technology generation and up-scaling needs through laboratory research and/or pilot plants.
7. To mobilize financial and other resources for IPR matters. This would include facilitation for priority setting and defining the needs for arranging assistance for IPR matters from the ICAR system and outsourcing.
8. To avoid duplication of efforts, including management efforts aimed at providing efficient and cost-effective services with effective liaison and linkages.
9. To provide guidelines of “best practices” from time to time to promote the interests of IPR portfolio management and technology transfer in agriculture.
10. To include activities aimed at confidence building among the agriculture-based industry for IP transactions for commercial use.

¹⁰⁰ This may include information on (i) Potential licensees in various areas of interest, (ii) Methodologies for assessing markets to help understand the current and potential product needs and demand, (iii) Indicators to understand the value of specific IPR in product development, and make realistic negotiations, (iv) Comprehensive and effective management of IPR through in-house expertise or mobilization of know-how in matters such as legal and regulatory, technology transfer, market research, etc.

11. To track/cause tracking for patents and licences.
12. To monitor the progress of IP management and commercialization in ICAR.
13. To liaise and network with national and international IP management and commercialization institutions.
14. To facilitate/help in setting up an institution where IP generated by publicly funded institutions can be pooled (e.g. PIPRA¹⁰¹) to advance the excellence in technology generation in agricultural research.
15. To facilitate centralized in-licensing of proprietary research tools by ICAR that may be important for research needs in frontier areas at its institutions.
16. To innovate and adopt a suitable mode in which Consortia of different ICAR institutions focusing on particular/frontier areas of agricultural research will be able to operate.
17. To do other things as may be directed and/or relevant for the promotion of management of IPR portfolio and the transfer/commercialization of IPR enabled ICAR technologies.

10.4.6 Funding Arrangement. The ATMC will be funded under the ICAR Plan Scheme¹⁰² on IP management and technology transfer/ commercialization. In the long run, ATMC will generate its own resources through licensing fees and royalties, etc. to become financially independent of ICAR.

10.5 Zonal Agro-Technology Management Centre (ZTMC)

10.5.1 ZTMCs will be established at selected ICAR institutions identified as the zonal level institutes. ZTMCs will provide need based support to the other ICAR institutions in the zone for (i) the assignment/management of the IPs held by them, and (ii) the transfer/commercialization of IPR enabled ICAR technologies. ZTMCs will assist ATMC in discharging its functions and maintaining liaison at the zonal level.

10.5.2 The ZTMCs will be headed by Zonal Chief Executive Officers (ZCEOs) who will be supported by two experts with requisite knowledge in issues related to IPR/law and business, and suitable administrative, technical and support staff. The ZTMCs will have the powers and flexibility to outsource for efficient execution of IP matters. ZTMCs will receive necessary logistic and funding support from the ATMC/ICAR through the Plan Scheme.

10.6 Institute Technology Management Units (ITMUs)

The ITMUs will be established at each of the ICAR institutions¹⁰³. The ITMUs will discharge day to day functions for the management of IPR portfolio and commercialization of IPR enabled ICAR technologies. The zonal institutes will also have their own ITMUs to deal with their IP related matters. The ITMUs will receive case-specific assistance/support on request from the respective ZTMCs of their zone and the ATMC/ICAR. The ITMUs will also receive necessary funding support from ZTMCs through the Plan Scheme.

10.7 Empanelment, Outsourcing and Engagement of Consultants

¹⁰¹ (Pooling of) Public Intellectual Property for Research in Agriculture (PIPRA) <<http://www.pipra.org/>>

¹⁰² A Plan Scheme will be prepared for IP Management and Technology Transfer/ Commercialization in ICAR with contribution from central government and ICAR's own internal resources. The IP Management and Technology Transfer/ Commercialization initiative will have convergence with the business planning and development (BPD) component of the National Agriculture Innovations Project. (NAIP) (2006-2012). Till the time that the Plan scheme takes effect the IP Management and Technology Transfer/ Commercialization may be initiated with ICAR's own resources with convergence from the NAIP component.

¹⁰³ At the National/Central/Indian Institutes, National Bureaus, Project Directorates, and National Research Centres of ICAR.

10.7.1 ***Empanelment.*** The ATMC will prepare a panel of experts/ entities for various kinds of need-based consultation and counsel. Procedures for empanelment will be decided by the ATMC. The panel prepared by ATMC will also be used by the ZTMCs and the ITMUs whenever required.

10.7.2 ***Outsourcing.*** Work relating to a professional nature, for which adequate expertise is not available in the ICAR may be suitably outsourced by the ATMC, ZTMCs and ITMUs.

10.7.3 ***Engagement of Consultants.*** The ATMC will engage consultants as and when necessary or required for assistance to ICAR in various specific matters concerning the IP management and technology transfer/commercialization. The terms and conditions of their engagement and remuneration will be decided by ATMC.

Chapter 11

Incentives and Benefit Sharing

11.1 Introduction

To provide greater impetus for research and innovation ICAR will share with its scientists/innovators monetary benefits from transfer/commercialization of the IPR enabled technologies. ICAR will also reward and confer awards upon its scientists and other staff. This chapter describes the procedure for incentives and benefit sharing¹⁰⁴.

11.2 Awards

ICAR has a system of recognizing the achievements of its meritorious scientists through annual conferment of awards. It will review and expand the scope of its awards and institute new awards, including monetary rewards, so that (i) innovation is stimulated (ii) basic science frontiers are furthered, and (iii) research in neglected crops and underprivileged areas is encouraged¹⁰⁵.

11.3 Benefit Sharing

11.3.1 *Monetary and Non-Monetary Benefits.* ICAR will realize monetary and non-monetary share of benefits from the licensee(s) of its IPR enabled technologies in the following ways, subject to the licence agreement, (i) upfront lump sum payment, (ii) upfront payment plus royalty on actual sale, (iii) royalty on actual sale, (iv) in-licensing/cross licensing of tools of technology generation in frontier areas, (v) research capacity building, (vi) research chair, (vii) research fellowship, etc.

11.3.2 *Scientists and Staff.* ICAR will share the income resulting from commercialization of an IP with individual(s) responsible for the innovation. The amount to be distributed/shared will be the accruals after deduction of service tax and the amount retained by ICAR for augmenting IP management. The payment will be treated as bonus income of the individual and shall be taxable under the Income Tax Act.

11.3.3 *ICAR Institutions.* ICAR will share part of the net revenue/benefit money resulting from commercialization with the concerned institution(s).

11.3.4 *ICAR Headquarters.* ICAR will retain part of the income resulting from commercialization at the headquarters. It will provide these funds to the ATMC as per the agreed terms and conditions for improved management of IP and technology commercialization¹⁰⁶.

¹⁰⁴ At present there is no related legislation in the country. ICAR will harmonize/evolve its guidelines as and when any such national legislation emerges in due course.

¹⁰⁵ Awards e.g. the Basant Rao Naik Award is for research in rainfed farming.

¹⁰⁶ Used towards (i) Cost of seeking patent/ IPR protection. (ii) Cost of maintenance of patent/IPR (iii) Cost of licensing of patent/IPR (iv) Overhead costs (v) Taxes, other than Service Tax (vi) Reimbursements as may be necessary or required by law, (vii) awareness generation for IPR and (viii) other costs, if any.

11.3.5 **Staff Welfare.** A share of the monetary benefit will be earmarked for staff welfare and will be placed with the Staff Welfare Fund of ICAR headquarters and concerned institutions¹⁰⁷.

11.4 Sharing of Benefit Money

11.4.1 The net revenue/ benefit money available for sharing between various stakeholders will be determined as follows.

Head	Amount
1. Gross Revenue (commercial benefits accrued from licence fees/ royalties)	= A
2. Service Tax ¹⁰⁸ paid or due	= B
3. Amount retained by ICAR for augmenting IP Management = 30% of A	= C
4. Net revenue/ benefit money to be shared as incentive = A – B – C	= X

11.4.2 The amount equivalent of 30 per cent of the gross revenue will be retained by the ICAR and the revenue will be used in addition to budgetary support towards cost of seeking patent/IPR protection, including the cost of outsourcing for expert assistance, if any, cost of filing, etc., cost of maintenance of patent/IPR; cost of licensing; overhead costs; taxes, other than service tax; reimbursements as may be necessary or required by law, and other costs, if any. ICAR will decide the allocation of the retained 30 per cent between the ATMC and the institution.

11.4.3 **Sharing of Net Revenue/ Benefit Money.** The net revenue/ benefit money will be shared in the following proportion/manner among (i) ICAR scientists/innovators and other staff, (ii) ICAR institution(s), and (iii) ICAR headquarters.

Stakeholder category	Share of net revenue
ICAR scientists/innovators and other team members	60%
ICAR Institution(s) (includes 5% of net revenue/benefit money for staff welfare)	25%
ICAR headquarters (includes 5% of net revenue/benefit money for staff welfare)	15%

11.4.4 **Apportionment of Scientists' Shares.** The 60 per cent share of the net revenue/ benefit money will be shared among the concerned scientist(s) and other team members based on mutual agreement. In case of any disagreement, the decision of the ITMC will be final.

11.4.5 **Tax Payable by Individuals.** There will be no upper limit on the amount to be received as benefit money by an ICAR scientist or other team/staff member on account of IPR enabled technology transfer/ commercialization. However, payments will be governed by Income Tax Rules and the disbursing institutions will deduct Income Tax at source as per the prevailing rates.

¹⁰⁷ Staff Welfare Fund will be used for various on and off campus welfare measures including the amenities in office/labs that would help improve the over all work culture.

¹⁰⁸ All IPRs for commercialization have been included in the service tax net in India in 2006. At present the rate of service Tax is 12.24%, including educational cess (12% Service Tax + 2% of the Service Tax as Educational Cess)

11.4.6 ***Institution(s) Share of Net Revenue/ Benefit Money.*** ICAR institutions will not remit their share of net revenue/ benefit money to ICAR headquarters as a component of resource generation. The ITMC at the institution(s) will decide regarding further sharing¹⁰⁹ and utilization of the institution's share of the benefit money.

11.4.7 ***Apportionment of ICAR Share.*** The CTMC at the headquarters will decide regarding further utilization of the benefit money earmarked for ICAR headquarters.

11.4.8 ***Sharing Between/ Among the Institutions.*** The net revenues/ benefit money will be retained and service tax paid by ATMC or the concerned institution that has entered into the licence agreement. The IPR/commercialization money will be shared between/among the institutions on mutually agreed terms. In case of any difficulty, mediation by the concerned ZITMC will be done. If differences persist, the decision of the CTMC will be final and binding.

11.4.10 ***Sharing Between Institution and Scientists.*** The revenue between the institution and scientists will be shared as follows:

1. *Copyright.* Revenue generated through sale of a copyright publication (e.g., book) published outside ICAR will go entirely to the author(s). Among the authors, the share may be divided based on mutually agreed terms among the authors.
2. *Consultancy and Contract Services.* Revenue sharing will be as per the existing ICAR Rules and Guidelines, 1997, which may be amended from time to time as appropriate¹¹⁰

¹⁰⁹ Sharing with staff other than the research team

¹¹⁰ Training, Consultancy, Contract Research and Contract Service in ICAR: Rules and Guidelines, 1997. ICAR, New Delhi (Johl Committee Report)

Chapter 12

Human Resource Development

12.1 Introduction

To harness the benefits of the IPR regime, ICAR will place highest priority on building institutional capacities and upgrading competence and skills so that an IPR compatible research environment is created/fostered which is also sensitive and responsive to the ethos of commercialization of agriculture. This chapter describes the strengthening of capacity building and human resource development in management of IP and the IPR enabled technologies.

12.2 Developing Competence

12.2.1 Capacity building of all cadres of the ICAR will be undertaken to equip them with the knowledge for effective management of IP and commercialization of IPR enabled technologies. Training and skill upgradation programmes will be organized for those engaged in the generation of IP (researchers) as well as for those who provide assistance/support in technical, administrative, financial, and personnel matters.

12.2.2 A multi-pronged approach will be followed for the sensitization and developing competence for IPR management and transfer/commercialization of technologies. This will include (i) awareness generation, (ii) training for IP management, (iii) IP education, and (iv) special skill development.

12.2.3 ATMC together with NAARM will develop capacity building programmes suited to the needs of ICAR and other national partners/stakeholders.

12.3 Awareness Generation

12.3.1 Programmes and packages will be developed for creating awareness of IP related issues and commercialization of technologies among all ICAR scientists; research managers, administrative, personnel and finance officers, and technical staff.

12.3.2 ATMC/NAARM will develop an IPR Primer¹¹¹ using illustrations derived from various disciplines of agricultural/biological sciences. It will be published by ICAR (in hard and soft copies) for wide dissemination and imparting IPR awareness. The awareness generation packages and programmes¹¹² will also use internet¹¹³, print media¹¹⁴, electronic media and various internal mechanisms¹¹⁵ of ICAR.

¹¹¹ The "IPR Primer" may explain the fundamentals of IPR, such as, innovative steps; novelty, inventiveness/non-obviousness and industrial applicability/utility; distinctness and distinguishability; DUS; design, function; undisclosed information, etc. The primer would include the enumeration of the first steps as per the guidelines, which should be taken by a scientist who feels that his/her research output deserves IPR protection. Consequences of failure to take such steps will be explained with suitable examples from different fields.

¹¹² ICAR institutions will conduct awareness generation programmes for their staff and other partners/stakeholders to make them aware that IPR could be a potent tool for technology transfer/commercialization.

¹¹³ Putting on the Internet some frequently asked questions (FAQs) on IPR along with their simple, illustrative answers.

12.4 IP Related Training

12.4.1 Short sensitization meetings ¹¹⁶ /seminars/workshops on various aspects of IP management and technology transfer/commercialization will be organized for senior officers of ICAR.

12.4.2 **Trainers' Training.** Training of trainers and faculty in various legal, technical, managerial aspects of IP will be conducted to enable core competence/ capacity building in IP management and technology transfer/commercialization. Centres of excellence will be developed at NAARM and identified zonal institutes. Curricula will be developed covering topics on IP protection/maintenance in India and abroad, IP/technology licensing, patent watch, market intelligence, on-line dialogue, special skills like negotiation, arbitration, etc.

12.4.3 **Foundation Level and Advance Training.** NAARM will reorient its foundation level and higher level training programmes (refresher courses) with a specific component on IP management and technology commercialization for fresh entrants and senior scientific staff. The IPR trained staff from various ICAR institutions will, in turn, contribute towards training of the remaining staff at the respective institutions.

12.4.4 **Training in India.** It will be organized by ATMC/ZTMCs at NASC and the zonal centres of excellence ¹¹⁷. Sponsored trainees will be invited from various ICAR institutions from different categories of staff in different programmes/batches. ICAR institutions will also provide opportunity to its scientific staff to get IPR exposure/orientation training in the country, which may be organized by other organizations such as Management Institutions, Law Schools, Universities, etc.

12.4.5 The following country-wide training courses may be organized at various levels in ICAR:

1. *Short term training courses:* About 2-3 weeks duration courses including hands on experience, may be organized at least twice a year at all ICAR institutions.
2. *Summer and Winter Schools.* Summer and winter schools may be organized for academic, scientific, technical, and administrative staff in the area of IPR and commercialization of technologies in agriculture and allied sectors in order to enhance over all competence.
3. *Long term training courses.* 3-4 months training courses leading to diploma/certificate may be organized at the zonal centres of excellence.
4. *Special training programmes* may be conducted in areas such as patents, protection of plant varieties and farmers' rights, other forms of IPR, with special emphasis on agricultural research and education. Training on regulatory Acts, such as, Seeds Act, Environment (Protection) Act, and Biological Diversity Act may also constitute an

¹¹⁴ Publication of "IPR and Agriculture" features and advertisements in print media in various languages in easy to understand, simple texts for all sections of society.

¹¹⁵ Frequent publication and wide dissemination of brochures and technical bulletins, and other common literature on updated information concerning IPR in agriculture, etc. -- Special ICAR fact-sheets on IPR & Agricultural Research for awareness programmes for media persons and for professionals in law; Publication of IPR related news updates in the ICAR Newsletter/Institution Newsletters including success stories and significant achievements as a regular feature in the ICAR system in future; Organizing a dedicated session on IP management and commercialization of technologies issues in the seminars/conferences sponsored by ICAR; Organizing and appropriately televising Competitions and Quizzes for Students of various age groups on IPR & Agricultural Research Awareness at/through the National Museum of Agriculture, ICAR.

¹¹⁶ ATMC may organize IPR sensitization events with the involvement of invited experts/specialists from India and abroad.

¹¹⁷ At the identified zonal institutes.

important part of the special training programmes. ATMC may facilitate/support such programmes with the approval of competent authority. Funding by other agencies may be accepted in such collaborative programmes.

5. *International training*: ICAR may organize short to medium duration skill upgrading courses at the zonal centres of excellence. Trainees may be invited from SAARC, ASEAN, Middle East, Africa, and other developing countries. Common sources of funding may be tapped to promote this activity.
6. *Regional priority setting and capacity building workshops* may be organized at NASC by ATMC/ICAR/DARE from time to time with the approval of competent authority.

12.4.6 Overseas Training. ICAR will nominate and support its scientists, senior officers, research managers and others as and when it is considered necessary for obtaining expertise on IPR issues overseas in centres of excellence.

12.4.7 On-Line Training. ATMC will develop and launch on-line training programme on IPR in agricultural research and technology management.

1. Collaboration will be made with suitable national or world organizations like Indian Law Institute, National Law Schools, World Intellectual Property Organization (WIPO), etc.
2. Suitable training modules(s) will be developed and other details such as announcement of schedules, registration, fees, exams, on-line tutors, software, etc., will be worked out.

12.5 IPR in Agricultural Education

Post-graduate teaching in IPR and technology management/commercialization in various disciplines of agricultural science will be conducted at the deemed universities of ICAR.

1. One course on IP and technology management in agricultural research and education at the post-graduate level will be included in the curriculum. It will cover skill development for greater participation in agri-business activities by turn-outs; encourage entrepreneurship; and equip the agricultural graduates to become job creators rather than job seekers.
2. ICAR/institutions will publish text books, and compendia on IPR protection and technology transfer in their mandate crop/commodity/areas for use as reference books for teaching in IPR.
3. The ICAR institutions will develop a network of e-libraries to support on-line data search and literature for latest information and data on IPR in the national and global contexts.

12.6 Special Skills in IP Management

Upgradation of special skills will be undertaken towards developing prompt two-way communication between the ATMC/ZTMCs and other ICAR institutions/scientists for addressing the situations/issues arising from IP/technology management both nationally and globally on a regular basis.

1. Training will be provided to staff by expert professionals in law, commerce and business to upgrade their skills in IP and technology management, including negotiation and arbitration skills.
2. Capacity building will be undertaken for an improved understanding of the industry and market environment through techno-economic market surveys, inventorization of transferable/ marketable technologies, and exploration of marketing channels for products and services.

3. Interactive web-enabled mechanism for dialogue with stakeholders on the various IPR related issues will be developed by the ATMC.
4. A user-friendly database of scientists/experts on IPR issues and commercialization of technologies will be generated at the ATMC/ ZTMCs and updated periodically.

12.7 HRD Budget

ICAR will make adequate allocation for training/HRD/capacity building in areas relevant to IP management and commercialization of IPR enabled technologies. Part of the monetary benefits realized from commercialization of ICAR technologies will also be reinvested in human resource development.

12.8 Research on IP Management

Research project(s) may be initiated by ICAR at its headquarters, NAARM, NCAP and deemed universities to build upon techno-legal aspects of IPR management in agricultural research.

12.9 Monitoring

ATMC and NAARM will jointly develop a system of monitoring the planning and implementation of various capacity building programmes on IP management and technology transfer/commercialization and CTMC will review the status of implementation of these programmes.

Annexure 1**Confidentiality Agreements**

(There is no set formula or a 'one-size-fits-all' situation for Confidentiality Agreements¹¹⁸. Such agreements may be entered into in various shapes and sizes, from the short and simple to the long and legalistic. For example, a simple undertaking duly signed by all concerned members may be sufficient for internal use of a Committee. On the other hand, the confidentiality agreement for transfer of IP/know-how has to be elaborate. The following example illustrates the types of clauses that may be incorporated in these agreements. Nevertheless, it is merely an example and one may have to consider the particular circumstances in which any confidentiality agreement is to be reached.)

Confidential Disclosure Agreement

Signed on [Date]

Between

[ICAR/institution name and address] as the First Party

And

[Organization/Company name and address] as the Second Party

1. On the understanding that both parties are interested in meeting to consider possible collaboration in developments arising from [ICAR]'s intellectual property it is agreed that all information, whether oral, written or otherwise, that is supplied in the course or as a result of the said meeting shall be treated as confidential by the receiving (Second) party.
2. The receiving (Second) party undertakes not to use the information for any purpose, other than for the purpose of considering the said collaboration, without obtaining the written agreement of the disclosing (First) party.
3. This Agreement applies to both technical information and know-how communicated by either party.
4. This Agreement does not apply to any information in the public domain. [If appropriate, the relevant public domain information can be listed as annexure to this agreement].
5. Either party to this Agreement shall on request from the other party return any documents or items connected with the disclosure and shall not retain any unauthorized copies or likenesses.
6. By this Agreement, or the communication of information by ICAR [First Party] referred to in paragraph 1, the Second Party is not entitled to any license or right or interest in respect of any Intellectual Property Rights of the disclosing party [ICAR].
7. After [number of] years from the date hereof each party shall review or be relieved of all obligations under this Agreement.

Signatures [Authorized Signatory of ICAR]
For [Indian Council of Agricultural Research]
Dated _____

Signatures [Representative (Authorized Signatory) of the Organization/Company]
For [Name of Organization/Company]
Dated _____

¹¹⁸ The one-size-does-not-fit-all situation holds true for all type of agreements and, therefore, the information provided in various annexures may be suitably adopted for case-specific situations through in-house expertise or outsourcing.

Annexure 2**Check-List of Elements for Material Transfer Agreement**

(The Material Transfer Agreements (MTAs) will be entered into by ICAR/its institutions with the other contracting parties on case-to-case basis through discussion, elaboration of individual clauses, negotiation, development and inclusion of broadly the following elements. The format of MTA may, however, be copied or adapted from any standard agreement.)

1. **Names and Addresses** (Legal Status) of the Contracting Parties (e.g. ICAR/concerned institution of ICAR and the other contracting party(ies)) should be given. In case the MTA is to be signed by an ICAR institution, it must mention "A constituent of the Indian Council of Agricultural Research (ICAR), 1, Dr. Rajendra Prasad Road, Krishi Bhawan, New Delhi – 110012." In parenthesis after the name and address of that institution in the contracting parties.
2. **Mandate and/or general objectives** of provider and user of Material (e.g. genetic resources) being transferred may be mentioned.
3. **Definitions.** The interpretation implied from specific terms used in the MTA, if required, shall be given.
4. **Description of Material** covered by the MTA along with information being shared, if any, will be given.
5. **Confidentiality.** The confidentiality clause must bind the other contracting party not to disclose specific information of the material being transferred.
6. **Permitted uses of the Material** (e.g. research, breeding, commercialization).
 - Must keep in view the potential uses of the Material, and its products or derivatives while agreeing for the specific uses in the MTA.
 - Must add a statement in MTA that any deviation from the permitted use shall require a new prior informed consent/MTA/Benefit Sharing Agreement.
7. **IPR** over the Material, its products and/or derivatives.
 - Conditions under which IPR may or may not be sought by the other contacting party shall be specified.
 - Mention of assignment or transfer of rights, or any exclusion of the right to claim any IPR should be made.
8. **Benefit Sharing.** Terms of arrangement for benefit sharing for monetary and non-monetary¹¹⁹ benefits should be mentioned.
9. **Elements/Clauses that may survive beyond the MTA.** Fact must be mentioned that the obligations in certain clauses (e.g. denomination of a variety) shall survive the termination of the agreement
 - **Independent enforceability** of clauses in the agreement, if any, should also be specified.
10. **Warranties.** It must be mentioned in the MTA that there will not be any warranties on the condition or quality of the material being provided by ICAR/institutions despite that efforts shall be made to transfer the material in good condition and of standard quality. It must be mentioned that liability of ICAR/institutions in case of any damages shall not exceed the minimal costs of handling the material.
 - **Events limiting the liability** (such as unforeseen calamities, fire, flood, etc.) should also be mentioned.
11. **Transfer to Third Parties.** Permission to transfer the Material and/or the information accompanying the Material will be decided on a case-to-case basis and shall depend on the request by/ negotiations with the other contracting party. In cases where it is agreed to allow material transfer to Third Parties, the conditions under which this should apply must be recorded in the MTA.
12. **Compliance.** It must be expressly mentioned that all contracting parties shall be obliged to comply with the MTA.
13. **Duration of agreement** and the provision to revise the terms of agreement, if required/if any, within that duration shall be mentioned.
14. **Notice for terminating the agreement.** Time period by which notice for termination must be served (e.g. 30 days notice) will be given.
15. **Dispute settlement.** Provision of arbitration will be made. Arbitrator will be appointed by DG, ICAR.
16. **Choice of law/jurisdiction.** In the event of dispute Indian law would prevail and the jurisdiction would be Delhi High Court.

¹¹⁹ Monetary benefits may include any one or more than one of the following: (i) Fees, (ii) Up-front payment, (iii) Milestone payment, (iv) Royalty payment, (v) Licence fees in case of commercialization, (vi) Salaries and preferential terms where mutually agreed, (vii) Research funding, (viii) Joint ventures, (ix) Joint ownership of relevant IPRs, etc. Similarly, non-monetary benefits may include, (i) Sharing of research results, (ii) Collaboration, cooperation and contribution in scientific/R&D programmes, education and training, (iii) Participation in product development, (iv) Strengthening capacity for technology transfer, (v) Institutional capacity building, (vi) Access to relevant scientific information, including inventories and databases, (vii) Research directed towards priority needs, e.g. food and nutritional security, (viii) Joint ownership of relevant IPR.

Check-List for Invention/IP Disclosure¹²⁰ (Confidential)

(To be submitted by PIs/Inventors/Innovators to ITMUs/ZTMCs as Confidential Information)

(Note: Select information from this check-list may also be furnished as technology disclosure to the interested commercial entities who shall sign a confidentiality agreement with ICAR/institution)

File No. _____

1. **Title of invention.** The title should describe what the invention does but not how it is made or how it works.
2. **Patent/IP search report.** A report of the Patent Search carried out in common, free patent search engines for granted patents in USA (USPTO web site; <http://www.uspto.gov/>), Europe/World (EPO web site; <http://www.espacenet.com/>), etc., including the PCT Applications (WO).
 - i. **Search Terms.** A short list of words, phrases and/or categories should be provided that may help in making internet searches related to the invention/innovation.
3. **Brief overview of the invention (3 to 4 paragraphs).**
 - i. Provide a short, general overview of the invention including what it does in such a manner that a lay person would understand.
 - ii. What is the purpose of invention e.g. what problems does it solve?
 - iii. Is it a new product, process or composition of matter or is it an improvement over an existing product, process or composition of matter?
 - iv. What are the features and benefit of the invention?
4. **Technical description, details and supporting data.** Provide results, data or other indicative evidence that may explain how the invention works. Attach any papers or visual material that may be already available, whether published or unpublished.
5. **Prior Methods, apparatus, developments and publications.**
 - i. Provide description of the closest known methods/processes or apparatus/substances in existence along with disadvantages or problems of each of these methods/processes/ apparatus/ substances that are solved by the application of the present invention.
 - ii. Cite publications and patents, whether own or those of any one else, that may disclose the ideas/events/products closely related to the invention. e.g. most similar variety(ies) in case of PVP. (Attach all relevant papers, patents, advertisements etc. if available).
6. **Stage of development (2-3 paragraphs).** Describe the development status (whether it is at 'concept only' stage or it is already 'laboratory tested', or 'prototype', etc.). Also briefly indicate what further development would be necessary to commercialize it.
7. **Potential licensees.** Mention enterprises/companies that you think could benefit from the use this invention for commercial purposes.
8. **Publications/presentations/other forms of public communication.** Identify past and future seminars, talks, abstracts, publications and web postings that would be describing the invention¹²¹.

Type of disclosure (Publications, Seminar, etc)	Dates (s)

9. **Dates of conception and reduction to practice.** Describe the circumstances and dates surrounding development of the invention. The dates must be well documented so that any challenge to patent, if ever,

¹²⁰ Disclosure could also be an oral, written or electronic dissemination of the invention to a person outside the ICAR that may enable someone working in the field to practice the invention or repeat its development. However, any communication with colleagues and students within the ICAR community do not count as disclosures unless they have already used that communication for any public disclosure or publication, etc. It is important to disclose any such occurrences to the ITMU/ITMC for helping to arrive at best course of further action. Such disclosure may have to be made by the concerned institution to the enterprises/companies towards commercialization of the technology. In such cases, Director of the concerned institution must sign a declaration of field worthiness of the technology at the end of the disclosure document.

¹²¹ These types of disclosures may affect the scope of patent protection and the timing of filing and, therefore, must be thoroughly shared to arrive at best-fit judgment viewpoint.

shall be met. In this context, conception is the formulation in the mind of the PI/inventors of the ultimate working invention. Reduction to practice can be accomplished either actually or constructively¹²².

Is the date for the following documented in writing? If so, where?	Details	Date
Conception of invention		
First reduction to practice		

10. **Sponsorships.** Mention/identify all grants¹²³, contracts and other sources of funds contributing to research that led to the invention.

Agency or sponsor	Grant/contract	File No. /Subject

11. **Other agreements and interactions.**

- Mention/Identify any agreements¹²⁴ or interactions that have been/may have been entered into, which relate/could relate to the invention and might grant rights to an enterprise/ company/ any other party outside the ICAR.
- Provide the details of MTA entered into or other agreement/consent details if the invention is based on any material(s) obtained from another institution/ organization/company.
- Did you transfer to any researcher outside of your institution any new materials (DNA, peptides, cell lines, vectors, catalysts, alloys, etc.) related to the invention? Provide the details.
- Is there any other group, lab or researcher in the institution or in any other institution of ICAR or outside ICAR using your invention in their research programme? If so provide the details.

12. **Inventors.** Provide list of all those individuals who helped/contributed to the conception of the ultimate working invention. The people you include ultimately may or may not be legal inventors, Please place an asterisk (*) next to the name of the inventor to whom correspondence should be sent. If any person holds a sole or joint appointment with any other university, company or government agency, please note that fact.

Name of helping/ contributing individual	Whether recognizing as Inventor or Not ¹²⁵ (Yes/No)	Name of any other institution/ university/ organization/ company to which affiliated (also affiliated)	Name & Signatures along with Date, of the Inventors ¹²⁶	Name & Signatures along with Date, of the Unit/Division Heads of the Inventors ¹²⁷

13. **Declaration of Field Worthiness¹²⁸ of Technologies/ Products/ Substances/ Processes.** Where needed, Director of concerned ICAR institution shall sign the declaration, stating that the technology/ product/substance/process is field worthy for the purpose of obtaining IPR and for commercial use.

¹²² 'Actual reduction to practice' is the physical creation of the invention whereas 'constructive reduction to practice' is a detailed written description that demonstrates the invention will work as conceived.

¹²³ List all agencies that you would acknowledge in a publication. Be liberal in the interpretation on your part to help arrive at suitable conclusions at the institution level.

¹²⁴ These may include MTAs, research sponsorship agreements, collaborative research agreements (e.g. for consortia, networks, etc.), agreements for consultancy, outsourcing, etc.)

¹²⁵ This information shall be used for sharing of commercial benefits among the inventors (researchers' team), other contributing scientists/staff, etc.

¹²⁶ The Inventor should sign with date, along his/her name.

¹²⁷ In case of inventors, other than PI or Head of the unit/division, the signatures of his/her head of the unit/division or research guide/supervisor in case of research scholars is required. This may also be furnished as a separate certificate, mentioning the title of the research work and name of the contributing scientist/innovator, which is duly certified by the PI and countersigned by the head of the unit/division or research guide/supervisor of the inventor.

¹²⁸ Information on field worthiness shall be provided by the PI/inventor (s) and recommended by the concerned ITMU/ITMC and the declaration will be signed by the Director.

Annexure 5**Memorandum of Understanding**

(For Partnership between ICAR/Institution and Manufacturer/Industry for R&D, Promotion and Commercialization of Farm Equipment and Technologies. May be suitably modified for specific situations)

This Memorandum of Understanding is made on this ___ day of _____ 200___,

BETWEEN

The Indian Council of Agricultural Research, 1, Rajendra Prasad Road, Krishi Bhawan, New Delhi – 110001; hereinafter referred to as ICAR; [or] as represented by its constituent, the Central Institute of Agricultural Engineering, Nabi Bagh, Berasia Road, Bhopal, hereinafter referred to as Institute or CIAE, represented by its authorized representative as the First Party on one Part

AND

_____ (Name of the Enterprise/Organization/Institute/University e.g. M/s ...)_____

with Shri _____ as the authorized signatory hereinafter referred as the manufacturer or its authorized representative as the Second Party on the Other Part.

[Note: Mention the names and addresses of other contracting parties, if applicable, in cases of tripartite or multilateral agreements.]

2. General

2.1 This MOU is for taking up R&D, promotion and commercialization of technology/farm equipment (mention the technology/equipment) in partnership mode between ICAR (CIAE) and the enterprise [manufacturer/industry]. The project on which ICAR (CIAE) and the enterprise shall work will be based on one of the following.

1. ICAR (CIAE) has identified a problem for development of a farm equipment or technology and is desirous of taking up the project for development, promotion and commercialization of the technology in the partnership with the manufacturer/industry.
2. The manufacturer has identified a farm equipment or technology to be developed based on his market survey and feed back from clients, and is desirous of taking a project in partnership mode with ICAR (CIAE).

2.2 ICAR (CIAE) and the manufacturer shall prepare a detailed project document giving justification of the requirement, objectives, technical programme, detailed activity schedule covering the R&D, promotion and commercialization aspects. The Project Document will also indicate the expected outcome of the project. This Project document forms a part of this MOU and is appended.

2.3 Both Parties i.e. the ICAR (CIAE) on one part and the manufacturer on the other part shall be jointly responsible for the entire execution of the project for development, promotion and commercialization of the identified equipment/envisaged technology. The specific responsibilities to be discharged by each party on their respective part are listed in the subsequent sections.

3. Activities

The activities involved in Development, Promotion and Commercialization of the identified equipment/technology are the following¹³⁰:

3.1 Research and Development

1. Development of concepts based on review of literature and feed back from clients for the new technology leading to a concept design.
2. Design of components and sub-assemblies and preparation of engineering and manufacturing drawings.
3. Fabrication of prototype.
4. Laboratory testing of equipment and its sub-systems.
5. Field testing of the equipment.
6. Design modifications, if required, based on field testing/trials.
7. Field testing after incorporation of design refinement.
8. Preparation of design document incorporating important features, principles of operation and performance parameters.

3.2 Promotion

1. Publicity materials on new technology being developed for dissemination among possible users.

¹³⁰ These are indicative only. Depending upon the area/field of technology, suitable changes may have to be made in the stipulated activities.

2. Multi-location trials of the equipment on farmers' field for its efficacy and feed back for design refinement, if any.
3. Establishing new network and/or tapping existing networks for sale/distribution of the equipment after its commercial production.
4. Preparation of literature for publicity.
5. Preparation of audio-visual material for publicity, training and promotion.
6. Market survey for acceptability of the equipment and estimation of annual demand.
7. Identification of locations and carrying out the multi-location trials.
8. Preparation of manuals of User's Guide, Operation Care and Maintenance, Service and Repairs, etc.

3.3 Commercialization

1. Preparation of jigs and fixtures for commercial production of the equipment/technology.
2. Commercial production of equipment based on final design.

4. Responsibilities of ICAR (CIAE) and the Manufacturer

The specific responsibilities of the ICAR (CIAE) and the manufacturer shall be as follows:

4.1 Responsibilities of ICAR (CIAE)

1. The ICAR (CIAE) shall be responsible for carrying out and meeting expenses towards all activities required to be carried out at ICAR (CIAE). These may include review of literature, design of components and sub-assemblies, preparation of manufacturing drawings, laboratory and field testing of the equipment and its sub-systems and preparation of operators' and maintenance manuals and publicity material for promotion of new technology.
2. If an equipment or instrument is required to be imported, for development through reverse engineering and adaptation, the same shall be done by ICAR (CIAE) bearing the whole cost. The equipment imported for this purpose shall remain the property of ICAR (CIAE).
3. ICAR (CIAE) shall, as a part of this MOU, nominate a scientist or a group of scientists to work on the project.

4.2 Responsibility of the Manufacturer

1. The responsibility of the manufacturer shall include fabrication of the research prototype and other prototypes including design modifications for field testing and multi-location trials. Apart from this, the manufacturer shall also actively associate with R&D related activities such as conceptualization of the design, design of components and sub-assemblies and preparation of engineering and manufacturing drawings. They shall also participate in laboratory and field testing of the equipment and its sub-systems.
2. The manufacturer, as a part of this MOU, shall nominate its representative(s) to work on the project.

4.3 Common responsibilities

1. Depending upon the place where laboratory and field testing of equipment and its sub-systems to be carried out, the expenses towards transportation, test fee (if testing is done involving third party) and other logistics shall be borne by ICAR (CIAE) and the manufacturer based on mutually agreed terms and conditions on this account.
2. Both parties shall bear the salary and TA/DA expenses for their respective staff.

5. Intellectual Property Rights

The sharing of the intellectual property rights by the two parties shall be as follows:

1. When the design of the new equipment/technology is patented, the patent rights shall rest with both the parties on equal credit and rights basis, with ICAR (CIAE) as the first party.
2. Whenever ICAR (CIAE) promotes the new design as outcome of the project, it shall give due credit to the manufacturer in whose partnership the equipment/technology has been developed
3. ICAR (CIAE) shall not give the technology or the product under this MOU to any other person/ Institutions/ manufacturer for first three years without consent of the manufacturer.
4. When the manufacturer sells the equipment after its commercial production, he shall continue to give due credit to ICAR (CIAE) through prominent display on its pamphlets/literature and nameplates/labels fixed on the machine, packets, packages, etc., that the equipment has been developed in collaboration with ICAR (CIAE).

6. Price Fixation

The production cost per unit of the equipment/technology shall be fixed by a committee consisting of the representatives from the ICAR (CIAE) and the manufacturer. The committee shall be constituted by the Director, ICAR (CIAE) and recommended price by the committee shall be mutually agreed and approved by the Director, ICAR (CIAE) and the manufacturer. As and when required, the unit production costs shall be revised.

7. License Fee and Royalty

The manufacturer shall pay a fixed amount _____ as license fee, as jointly fixed by the two parties [and royalty @ 2% of the cost of the machine]; to ICAR (CIAE) for a period of three years from the commencement of commercial production of the equipment/technology. Royalty will be charged at above rate only on the equipment sold by the manufacturer. After the period of three years the payment of royalty by the manufacturer shall be reviewed, which may be continued at the same rate or the rate of royalty may be revised.

8. Duration

The MOU shall be valid for the period of the project to be taken up for the development and promotion of technology. Duration shall be specified in the project document.

9. Disputes

Any dispute arising during operation of the MOU shall be settled through mutual consultations and agreement or arbitration. Arbitrator shall be appointed by ICAR/Director, ICAR (CIAE). However, the decision of the ICAR (CIAE) shall be final and binding.

Signature

Signature

For the Manufacturer

Authorized Signatory

For ICAR/Institution

Head, IPM&TTU

Counter signed by: Director, Concerned ICAR Institution (CIAE)

Date:

Witness:

Annexure 6**Memorandum of Agreement**

(Indicative for commercial production of ICAR [CIAE] designed equipment by private/public enterprises;
Case-specific MOAs may be suitably developed)

This Memorandum of Agreement is made on this _____ day the _____ 20____.

BETWEEN

The Central Institute of Agricultural Engineering, Nabi bagh, Berasia Road, Bhopal, a constituent of the Indian Council of Agricultural Research, Krishi Bhawan, 1, Dr. Rajendra Prasad Road, New Delhi – 110 001, hereinafter referred to as Institute or CIAE represented by its authorized representative as the first party

AND

M/s _____ with Shri _____

as the authorized signatory hereinafter referred as the manufacturer or its authorized representative as the second party.

2. General

The Central Institute of Agricultural Engineering, Bhopal (CIAE) is engaged in research and development in the field of agricultural engineering for mechanization promotion in the country. The Institute has developed several agricultural tools, implements and equipment that are required to be manufactured and adopted by the manufacturers so that these are available to the farming community. The Institute is desirous of establishing close linkage with small scale manufacturers who are willing to manufacture and maintain the quality of the equipment, protect the intellectual property rights and are willing to upgrade the quality or any design changes as may be required from time to time in consultation with the Institute. The modalities of this activity shall be as follows:

- 2.1 The Institute shall identify suitable manufacturers who can take up production of ICAR (CIAE) technologies/equipment.
- 2.2 The Institute shall provide guidance wherever required and help the manufacturer to manufacture the ICAR (CIAE) equipment using proposed material and maintaining specifications, quality and performance.
- 2.3 Wherever required, the manufacturers shall be guided to adopt appropriate production/manufacturing process, jigs, fixtures, special tools etc. for production of ICAR (CIAE) technologies/equipment maintaining quality.
- 2.4 Specialized training programmes of short duration may be arranged by the Institute on request of the manufacturer for which training cost, as decided by the Institute shall be borne by the manufacturer.

3. Agreement

The Institute and the manufacturer shall sign this agreement to maintain close liaison and co-operation for taking up production of ICAR (CIAE) developed equipment or technologies promoted by the Institute for which the Institute shall provide necessary know-how and guidance for commercial prototype production on payment of nominal institutional fee and training fee as specified or as decided by the Institute. The other terms and conditions shall be as follows:

- 3.1 Institutional Fee - Manufacturer, may sign the MOA by paying a token Institutional Fee (non-refundable) of Rs. 20,000/- for manufacture of identified ICAR (CIAE) equipment. The MOA shall be valid for a period of three years from the date of signing the MOA.
- 3.2 Technology selection - Every manufacturer may indicate the list of ICAR (CIAE) technologies that he wants to manufacture. The Institute reserves the right to allot designs of equipment to different manufacturers.
- 3.3 Technology details - The Institute shall make available on cost basis the details of the technology in the form of prototype and/or manufacturing drawings, specifications and other technical details for commercial prototype development or manufacturing of the prototype.
- 3.4 Price List - A price list of ICAR (CIAE) technologies shall be available and revised from time to time by the Institute. The price list shall indicate selling price of a machine to the farmers or users. The price of an equipment shall be fixed by the manufacturer in consultation with ICAR (CIAE).
- 3.5 Royalty - The manufacturer shall pay royalty @2.5% of the specified price in the price list for the sale of each machine sold by him.
- 3.6 First sample prototype - A manufacturer, making a ICAR (CIAE) machine on order for the first time, has to get the prototype inspected and approved by the Institute.
- 3.7 Quality improvement – The Institute shall strive to continuously improve the quality of the equipment. It will be obligatory on the part of the manufacturer to incorporate these improvements in the design.

- 3.8 Manufacturing facilities - The manufacturing facilities, track record etc. of a manufacturer shall be considered for entering into MOA by the Institute for a particular machine.
- 3.9 The agreement can be terminated if there is any violation of the terms and conditions, quality and timeliness etc. as may be determined by the Institute.
- 3.10 ICAR (CIAE) core research facilities shall be allowed to be used by the manufacturer on request, if sparable, and on the terms and conditions of ICAR.
- 3.11 The Intellectual Property Rights shall lie with ICAR (CIAE).
- 3.12 The manufacturer will not license the ICAR (CIAE) technology to another party.
- 3.13 Third party responsibility shall not lie with ICAR (CIAE).

4. Duration

The MOA shall be valid for three years. On expiry of the contract the Institute and manufacturer may enter into the contract for another three years by signing fresh MOU and on payment of the Institutional fee by the manufacturer.

5. Amendment to the MOA

During operation of the agreement, if in the opinion of both the parties some alteration or modifications of the MOA is considered essential, these may be mutually discussed and agreed upon in writing.

6. Disputes

Any dispute arising out of during operation of the MOA shall be settled through mutual consultations and agreement. However the final decision of ICAR (CIAE) shall be binding.

Signatures

Signatures

For the Manufacturer
Authorized Signatory

For the ICAR Institution
Head, ITMU

Counter signed by: Director, Concerned ICAR Institution (CIAE)

Date :

Witness:

Annexure 7

Memorandum of Understanding
(Tripartite Agreement for Collaborative Research and Technology Up-scaling)

This Memorandum of Understanding is entered into this _____ day of _____, 20__.

BETWEEN

Indian Council of Agricultural Research, a registered society incorporated under the Registration of Societies Act (Act XXI of 1860) having its Registered Office at Krishi Bhawan, 1, Dr. Rajendra Prasad Road, New Delhi-110001, hereinafter called ICAR which expression shall include its successors in interest and permitted assigns, on the one part,

AND

Council of Scientific and Industrial Research, a registered society incorporated under the Registration of Societies Act (Act XXI of 1860), having its Registered Office at Anusandhan Bhawan, 2, Rafi Marg, New Delhi-110001, hereinafter called CSIR which expression shall include its successors in interest/service and permitted assigns, on the second part,

AND

Tobacco Board, established by Govt. of India under The Tobacco Board Act of 1975, Ministry of Commerce. Govt. of India and having its office at Srinivas Rao Tota, Guntur-522004 (Andhra Pradesh) (hereinafter called the BOARD, which expression shall include its successors in interest/grant and permitted assigns) on the third part.

2. Whereas, ICAR is promoting development of agricultural based technologies in India including research and development in the field of alternate uses of tobacco for development of biodegradable pesticide and drug intermediates at its constituent institution, Central Tobacco Research Institute, Rajahmundry (hereinafter called CTRI), where CTRI is in possession of bench scale technologies for extraction of 40 per cent Nicotine sulphate and 95+ per cent Solanesol from tobacco and tobacco waste, and where the process of extraction of 95+ per cent Solanesol is a novel invention for which Indian Patent Application is already filed by ICAR.

3. Whereas the said patent application, number 1071/DEL/2002 is based on joint invention by inventors from CTRI and also Central Drug Research Institute, Lucknow, an institute of CSIR (hereinafter called CDRI).

4. Whereas, CSIR, is promoting science and technology in India including research and development in process know-how for organic/inorganic/natural products based chemicals on laboratory and pilot plant scale at its Indian Institute of Chemical Technology, Hyderabad (hereinafter called the IICT), where the IICT also has expertise for design, procure install and commissioning of pilot plant for up-scaling of processes, and where IICT is also in possession of a laboratory scale process for the production of Coenzyme Q10.

5. Whereas BOARD working under the purview of Tobacco Board Act, 1975 is engaged in the planned development of tobacco industry in India by sponsoring, assisting, coordinating and encouraging scientific, technological and economic research for promotion of tobacco industry including by development and popularization of the alternative uses of tobacco.

6. Whereas BOARD recognizes the respective strengths of ICAR and CSIR in respect of the bench-scale technologies available at CTRI and IICT for alternate uses of tobacco, for development of process know-how on pilot plant scale and for up scaling of processes to develop industrial product and the fact that they are complementary to each other, And whereas an objective of BOARD is also to popularize the alternative uses of tobacco, the Board accordingly agrees to provide grant of financial assistance in the development of technologies and their successful transfer to industry for commercial exploitation and socio-economic benefits.

7. Whereas BOARD agrees to sponsor and grant through fund a project involving CTRI of ICAR and IICT of CSIR for (a) pilot plant studies of solanesol and nicotine sulphate processes based on CTRI laboratory scale processes, (b) development of pilot scale process for coenzyme Q10 based on IICT laboratory scale process, and (c) providing pre-feasibility report for tobacco based derivatives as per the scope of work detailed in the project appended to this Memorandum of Agreement (hereinafter called the PROJECT).

8. Now therefore, in consideration of the Grant hereinabove by BOARD to CTRI and IICT as per covenants hereinafter contained, the parties hereto agree as follows:

1. Whereas BOARD further agrees to grant a sum of Rs. xx,xx,xxx/- (Rupees xxxxx xxxxx lakh only) to CTRI for the utilization of which it may stipulate terms and conditions for compliance by CTRI,
2. Whereas, BOARD also agrees to grant a sum of Rs. xx,xx,xxx/- (Rupees xxxxx xxxxx only) to IICT for the utilization of which it may stipulate terms and conditions for compliance by IICT,

3. Subject to the stipulations/conditions contained in the BOARD sanction letter for GRANT, CTRI (ICAR) agrees to undertake and complete the PROJECT on its part and also agrees to supply relevant specification and details to IICT for the work assigned to IICT in the PROJECT.
4. Subject to the stipulations/conditions contained in the BOARD sanction letter for the GRANT, IICT (CSIR) agrees to undertake and complete the PROJECT on its part at CTRI and also agrees to submit progress report in every three months.
5. Subject to the stipulations/conditions contained in the BOARD sanction letter for the GRANT, BOARD agrees to release the GRANT to CTRI against the requisition of CTRI and to IICT against the requisition/proforma invoice of IICT
6. There will be a joint MONITORING GROUP of the PROJECT constituted by ICAR, CSIR and BOARD and consisting of Director, CTRI, Director, IICT and nominee of the BOARD as members. The joint monitoring group shall review the progress of the PROJECT at the end of every three months and will identify the criteria for completion of the PROJECT.
7. The PROJECT shall be deemed to have been successfully completed on satisfaction of the criteria fixed by the monitoring group or any other criteria mutually agreed to upon by the parties hereto.
8. Any intellectual property rights obtained by any of the parties hereto pertaining to the PROJECT prior to the signing of this MOU shall remain the property of that party; the other parties shall have the right to commercially exploit/use the intellectual property in consideration of this MOU and on mutually agreed terms.
9. Any intellectual property that is process/know-how/design/technique generated in the PROJECT shall be jointly owned by ICAR and CSIR.
10. Any jointly owned intellectual property generated in this PROJECT hereinabove contained shall be protected by patent/copyright/design as applicable. The question of whether or not intellectual property rights should be secured and the territory where these shall be secured shall be decided by the parties hereto. ICAR/CSIR shall be responsible for filing for securing and monitoring the intellectual property rights and the expenditure incurred thereof shall be borne by each party.
11. Any publications in respect of the PROJECT will be made in mutual consultation of parties; shall be in the names of research workers of CTRI and IICT who shall duly acknowledge in each of such publication that the work has been carried out under the PROJECT and with the GRANT by BOARD.
12. Parties hereto shall have the right to license the intellectual property generated/protected in the PROJECT to prospective clients on terms and conditions mutually decided between all parties hereto and the premia/royalty accrued from licensing hereabove contained shall be shared between ICAR (CTRI), CSIR (IICT and CDRI) and BOARD in a ratio of 40:35:25, wherein CSIR share of 35 shall be divided between IICT and CDRI in a ratio of 25:10.
13. If any of the parties hereto fails to fulfill its respective obligations as set out in this MOU, the parties hereto shall urgently consult each other with a view to correction of fault by the party concerned. In the event of any dispute or difference between the parties hereto, and if such dispute or difference is not resolved by mutual consultation, the unresolved dispute or difference shall be referred to arbitration¹³¹. The arbitration will be appointed by Director General, ICAR and award/decision of the arbitrator shall be final and binding upon parties to the dispute.
14. This MOU is valid for 18 months from the date of signing but may be extended for further periods by mutual agreement.
15. The MOU shall become effective on and from the date it is signed.

In witness whereof, the parties herein set respective hands on the day, month and year first above written in presence of following witnesses.

For and on behalf of ICAR	CSIR	BOARD
<p>() Authorized Signatory of Indian Council of Agricultural Research 1, Dr. Rajendra Prasad Road Krishi Bhawan, New Delhi-110001.</p>	<p>() Authorized Signatory of Council of Scientific and Industrial Research 2, Rafi Marg, New Delhi-110001.</p>	<p>() Authorized Signatory of Tobacco Board, Srinivas Rao Tota, Guntur- 582004 (A.P.)</p>
<p>Witnesses 1. _____ 2. _____</p>	<p>Witnesses 1. _____ 2. _____</p>	<p>Witnesses 1. _____ 2. _____</p>

Note: Project details will be annexed.

¹³¹ Standard arbitration clauses of the Govt. of India shall be relevant and applied as all the three parties to this tripartite agreement are public sector organizations.

Annexure 8**Joint Intellectual Property Management Plan in Collaborative Research Projects**

(To be developed and implemented by ICAR/institutions in respect of sharing the research results/intellectual property generated from collaborative projects¹³², including their IP protection and Commercialization)

Before starting a collaborative research programme, the concerned ICAR institutions shall ensure that a joint IP Management Plan (JIPMP) is prepared in consultation with the collaborating partner(s). A copy of the JIPMP shall be appended to the project proposal document and submitted to ICAR/DARE for information/concurrence. If needed, the concerned ICAR institutions and collaborating partners in consultation with each other may modify and/or complete the JIPMP later, in a timely fashion. However, if it is felt imminent, a mention to this effect shall be made in the initial JIPMP. A copy of the modified/completed JIPMP shall also be submitted to ICAR/DARE for information/concurrence.

The following illustration describes how the objectives, scope, conditions, modalities and other features will be included in the JIPMP.

1. Joint Intellectual Property Management Plan

Project Title _____
Collaborating Institutions _____
Investigators _____

2. Objectives

These guidelines define the modalities of protection, maintenance, and commercial utilization of joint IP, and allocating the rights, interests and royalties among the ICAR/its institutions and the collaborating partners.

3. Scope

This joint IP management plan will be applicable to the management of intellectual property generated from joint research/efforts, from the above titled project and shall include the protection and maintenance of IPR, and the commercialization of IP.

4. Definitions

The following terms hereinafter referred to in these guidelines correspondingly mean as follows:

ICAR. The Indian Council of Agricultural Research (ICAR), Krishi Bhawan, 1, Dr. Rajendra Prasad Road, New Delhi – 110 001, a registered body incorporated under the Registration of Societies Act (Act XXI of 1860).

Project or Programme. The externally aided as well as the ICAR funded collaborative research project/programme approved by ICAR/DARE and jointly carried out by ICAR institutions with collaborating partners.

Partners. The ICAR institutions and their collaborators carrying out a Project or Programme.

Intellectual Property (IP). Includes, *inter alia*, patents, plant variety protection (plant breeder's rights), copyrights, trademarks, industrial designs, etc., in accordance with the Indian IPR laws and the corresponding IPR laws of the respective countries.

Background Information. The technical information and the know-how owned or controlled by either of the partners before the start of the project/programme in the same or related fields as the subject matter of the project/programme and necessary for the execution of the project/programme.

Background Intellectual Property. The IP owned or controlled by either of the partners before the start of the project/programme, in the same or related field as the subject matter of the project/programme and necessary for the execution of the project/programme.

Results. All kinds of information (knowledge) and IP generated by the partners in the execution of the programme.

5. Rights and Obligations of Partners in Protection of joint IP

¹³² This includes; Externally Aided Collaborative Projects; ICAR Funded Collaborative/Coordinated Research Programmes; Research Grants or Sponsored Projects where the Agreement signed with the grantor/sponsor does not render the joint IP generated as unencumbered for ICAR; and all other cases where joint encumbered IP is likely to be generated from joint research/efforts.

The partners shall ensure adequate and effective protection of IP resulting from the project/ programme as and where applicable and elaborate the same in JIPMP. The text of JIPMP shall further include mention of the following:

1. *Anticipation*: IP likely to be generated from collaborative efforts,
2. *Flexibility of Anticipation*: Likelihood of joint modification and/or completion of JIPMP during the course of implementation of the project/programme.
 - i. If mid-course review and modification of JIPMP is considered necessary, a timeline shall be indicated.
 - ii. Both initial and the modified/completed JIPMP documents will be treated as part of the Final Project Document/Database.
3. *Intimation of the Results/IP Generated*: It will be obligatory on the part of each partner to notify other partner(s) and their parental organizations (ICAR and the other) immediately of any result which can be protected as IP and take appropriate action for such protection.
4. *Sharing of IP*:
 - i. *Between partners*: The rights of joint encumbered IP arising from the project/programme will be shared equally, or in any other proportion, or otherwise, which will be expressly mentioned in the JIPMP.
 - ii. *Within each partner entity*: The respective partner shall be free to determine the sharing of the rights, interests and royalties as well as the liabilities between itself and its employees as per its internal practices/guidelines.

6. Modalities of Securing and Maintaining IPR and Know-How

The modalities of protecting the IP generated from the project/programme as well as the responsibility of securing the background IP/information (knowledge) will be determined as per the following:

1. The ICAR institutions and their collaborating partners shall decide the modalities of protecting/securing the IP rights for each background IP/information (knowledge) as well as the protectable IP generated from the project/programme, under the respective IPR laws.
2. For the genetic resources/germplasm declared/to be used as background knowledge/IP, the relevant access and benefit sharing related provisions of the Biological Diversity Act, 2002 and the Protection of Plant Varieties and Farmers' Rights, 2001 shall be applicable.
3. *In respect of each background IP or know-how*, the respective ICAR institution or the concerned collaborating partner shall have the following obligations:
 - i. Maintaining the IPR titles of the background IP during the entire course of the project/programme by making necessary payment for maintenance/renewal fee.
 - ii. Secure and maintain IPR on declared background IP, in case the protection is yet to be granted (e.g. provisional application is already filed).
 - iii. Secure the know-how for specific use in the project/programme without compromising its ownership, by entering into Confidentiality Agreement with the collaborating partners(s).
4. *In respect of each result which is to be protected*, the ITMU of the concerned ICAR institution in mutual consultation with the collaborating partner(s) shall prepare the necessary techno-legal documents for securing the protection. Advice/assistance of concerned ZTMC/ATMC may be obtained for availing the legal assistance of patent managers/IPR managers/technology managers through outsourcing.
5. *Applicants*: The application for securing the rights of the intellectual property shall be made in the names of all the partners, under prior intimation to their respective parental organizations.
6. *Inventorship*: In all applications for securing IPR, the persons who have directly contributed intellectual inputs shall be mentioned as inventors by the partners. Their names may be mentioned in the JIPMP or the revised JIPMP.
7. *Application Procedure*: The application for securing the patents will be made under the patent law by the concerned ICAR institution as per mutually agreed terms with the collaborating partners.
8. *Application for securing other forms of IPR* shall be similarly made as above in case of patents. It will be filed under respective IPR laws of countries concerned or international procedure, if any, where applicable.
9. *Reasons of not filing in India/home jurisdiction of the collaborating partner*: In case the ICAR institution has decided not to file the first patent application in India or the other partner(s) has decided not to file patent application in its/their respective country(ies), the decision and the reasons therefore shall be intimated to ICAR and/or the parental organization(s) of the respective partner(s).
10. *Intimation of Progress*: Within one month from the date of filing of the application, the partners shall forward to one another, and to ICAR/respective parental organizations, copies of the application filed including all appended documents. Similarly, the details of progress of such application from time to time, the grant of patent/IPR and maintenance of the rights shall also be intimated by the concerned ICAR institution and the collaborating partners, as and when they become available, to one another and to ICAR/respective parental organizations.

11. *Patent/IP Watch*: The concerned ICAR institution and other collaborating partners shall forward to ICAR/respective parental organizations details of applications, if any, relating to the same or substantially the same subject matter of the programme, filed after the completion of the programme. The ICAR institution/partners shall suitably initiate action to deal with the alleged infringement cases in consultation with IPM&TTC at the ICAR headquarter and/or through outsourcing.

7. Commercial Exploitation of IP

The ICAR institutions and their collaborating partners shall take all necessary steps for the commercial exploitation of the IP secured, to the fullest possible extent that is reasonably practicable, without undue delay in the following manner:

1. *Commercialization/Licensing arrangement*: The project/programme partners shall determine the modalities of commercialization of the IP secured in India and other countries on mutually agreed terms. They may entrust the commercialization work to one of them, carry it out jointly, entrust it to a third party or seek the assistance of ICAR/parent organization of a partner. The ICAR institutions shall mention the mutually agreed terms in the JIPMP.
2. If any partner(s) has/have the capacity to commercially exploit the IP by itself/themselves, such partner(s) will have the right of preemption.
3. The period of commercial exploitation by a partner and the right of preemption, if any, will be decided mutually by the partners with the concurrence of ICAR/parent organization of other partner. However, within one month of taking each commercialization decision, if any, the partner shall inform the other partner and ICAR/parent organization of other partner and forward copies of the relevant documents.
4. While making the commercialization/licensing arrangement on mutual agreement with the collaborating partners, the ICAR institutions shall also settle the proportion and terms of sharing the licensing fees and/or royalty and/or other commercial returns with the collaborating partners.
5. The ICAR institutions shall share the net returns from the commercializing efforts among the scientists/innovators, institutions and ICAR headquarters as per its guidelines.

8. Expenditure and Accounts

1. The expenditure connected with securing and maintaining the rights of intellectual property shall be borne by the partners.
2. Appropriate/adequate funding provision of securing IPR for the anticipated IP, as may be reflected from JIPMP, shall be proposed in the in-built project costs.
3. The partners may make a joint request to the main funding agency or ICAR or parent organization of the other partner to consider providing assistance including finances for securing and maintaining the IP rights.
4. The ICAR institutions along with their collaborating partners may also decide to seek assistance for securing and maintaining the IP rights from an external source in specific circumstances. However, they shall do so if appropriate only with prior approval of the Competent Authority in the ICAR headquarter.
5. The partners shall maintain separate detailed accounts in respect of (i) Expenditure incurred in securing and maintaining the IP rights on each application filed, and (ii) Commercial proceeds from each IP commercialized.
6. The partners shall exchange duly authenticated annual statements of accounts between them before the end of the subsequent financial year, and send copies to ICAR/parent organization of the other partner. ICAR/parent organization of the other partner may call for any additional or more detailed information on the accounts, which the partners shall be obliged to provide without any undue delay.

9. Sharing of the Accruals on the Commercialization of IP

1. In the event of the commercialization of IP by one or more of the partners, the said partner(s) shall share the net revenue earned by it (them) among themselves and also with ICAR/parent organization(s) of other partner(s).
2. The share to ICAR/parent organization(s) of other partner(s) will be as negotiated before start of the project. The share to be paid to each partner shall be decided by consultation among the partners, which shall be explicitly mentioned in the JIPMP.
3. The net returns from the commercialization of IP by outsourcing through Technology Transfer Agencies or License Managers shall be shared by the partners and ICAR/parent organization(s) of other partner(s) on mutually agreed terms, which shall be explicitly mentioned in the JIPMP.
4. In cases where any one of the ICAR/parent organization(s) of other partner(s) have provided the financial/other assistance for securing/maintaining the IPR, the expenditure incurred therefore by the ICAR/parent organization(s) of other partner(s) shall be reimbursed before the sharing of the revenue.
5. Within six months from the end of each financial year, the partners shall send a declaration of any shareable revenue to each other and parent organizations of all partners.

6. The concerned partners shall remit the respective shares of the other partner(s) and parent organizations of all partners to them along with the declaration made as above.

10. Renunciation

1. In case any of the partners renounces obtaining the IP protection for the joint encumbered IP or ensuring its maintenance or declines participating in the relevant expenditure, it/they shall immediately notify the same to the other partner(s)/their parent organizations.
2. The ICAR institutions/other partner(s) may proceed to obtain such IP protection in its/their sole name(s) and/or to ensure its maintenance. The expenditure connected therewith shall be exclusively borne by the said ICAR institutions/other partner(s).
3. The renouncing partner(s), in any such event of renunciation, shall, however, extend all assistance to the other partner(s) for completing the above said actions, and this shall be included as an essential clause in the JIPMP.
4. The ICAR institutions/other partner(s), who may obtain the IP protection and/or ensure its maintenance, shall be entitled to the revenue accrued by the commercialization, subject to the detailed provisions of JIPMP, including the setting aside of the share of parent organizations of all partners.
5. The JIPMP will include a list of the countries where the partners agreed to seek intended IP protection. It will also be mentioned that if one partner does not desire to seek protection in countries other than those identified in the above mentioned list, the other partner(s) may proceed for seeking such protection in the said countries solely in its/their own name(s).
6. The ICAR institutions/other specific partner(s) commercializing the IP in countries other than those mentioned in JIPMP, where another specific partner has declined to seek IP protection, shall have the right to share the net returns from the commercialization of such IP rights in the said countries.
7. The sharing of such revenue shall be made among the partners after deducting the service tax and the 30% share earmarked for the parental organizations of all partners.

11. Publications

1. Each of the partners shall have the right to publish the results emanating from the project/ programme. However, before any such publication(s) of the results of the project/ programme, the partners shall ensure in consultation amongst themselves that no rights are compromised.
2. The publications resulting from the programme shall bear the names of all the authors unless any author explicitly declines to be named.
3. Due acknowledgement shall be given in all such publications to the support extended by Grantor/Sponsor/Funding Agency and Parent Organizations in carrying out the project/programme resulting in such publications.

12. Confidential Information

1. The ICAR institutions/other partners shall identify as soon as possible, or correct in the framework of a project/programme, the information furnished that needs to be preserved from being disclosed. In doing so, it will be ensured that (i) The information is not generally known by experts in the field or easily available to them through legal means; (ii) The information has an effective or potential commercial value related to its confidentiality; and (iii) The partners have taken due steps to protect the confidentiality of the information.
2. The partner receiving, in the framework of a project/programme, information not to be disclosed, shall respect the confidentiality of such information.
3. A Confidentiality Agreement may be separately entered into among the partners for the protection of such confidential information. The JIPMP itself will also be deemed to be Confidential Agreement.
4. Without prior written consent, none of the partner(s) shall disclose any confidential information provided by the other partner(s) except to (i) The concerned employees, who shall be bound to keep it confidential and liable for any fault, and (ii) Any concerned legal/regulatory authorities who shall also be similarly bound under the law/regulations.
5. The (confidential) information, whose disclosure has been authorized for the activities and purposes of the project/programme, shall be used solely within the limits of the project/programme.

13. Infringement

1. ICAR shall not be liable to the consequences of any infringement of the IPR.
2. Any expenditure and/or damages, on account of such infringement shall be borne by the partners.
3. The partners may make appropriate provisions for dealing with apprehended or alleged infringements in the JIPMP.

4. ICAR institutions may seek appropriate assistance of IPM&TTC and/or outside experts to deal with infringement related matters.

14. Dispute Settlement

1. The foremost effort by partners in case of any IPR/commercialization related dispute arising from the project/programme shall be to resolve it through mutual discussions.
2. If the partners fail to reach any agreement through mutual discussions, the dispute shall be referred to the Director General, ICAR for settlement.
3. The Director General, ICAR shall appoint an arbitrator to amicably resolve the dispute. In case the suggestions of the arbitrator will not be agreed to by the concerned partners, the Central Technology Management Committee of ICAR will consider and decide the case, which shall be agreeable to/binding upon all parties.

15. Any Other Information

1. *Modified JIPMP.* If needed, a modified JIPMP shall be jointly prepared and documented by the collaborating partners. However, the original JIPMP shall continue to remain a classified document of the project/programme.
2. Any other relevant information, irrespective of whether in affirmative or negative (e.g. Do's or Don'ts), concerning protection/commercialization of joint IP in the ICAR set up will be appropriately included in the JIPMP.

Annexure 9**Memorandum of Understanding**

(For commercialization of ICAR technologies through a technology transfer agency, e.g., NRDC)

This Memorandum of Understanding is entered into this ____ day of _____, 20__.

BETWEEN

_____ Full Name and Address _____ (hereinafter called 'XXXX' which expression shall include its successors in interest and permitted assigns) of the one part

AND

The Indian Council of Agricultural Research, Krishi Bhawan, New Delhi – 110 001 a society registered under the Registration of Societies Act (Act XXI of 1860) (hereinafter called 'ICAR' which expression shall include its successors in interest and permitted assigns) of the other part.

WHEREAS, ICAR is promoting development, identification and transfer of agricultural research based technologies including research and development in the field of agriculture in India through research projects at its institutions. As a result, a large number of technologies have been generated which can be transferred for social benefit and commercial exploitation by private and public sector agencies and industries.

WHEREAS 'XXXX' is a company/agency engaged in/established with the objective of *inter alia* promotion/development/ commercial exploitation of technologies and know-how for benefits of farmers and agriculture sector. Since inception, 'XXXX' has achieved
..... in India and abroad.

WHEREAS ICAR and 'XXXX' recognize the respective strengths of each other, and the fact that they are complimentary, both parties agree to cooperate in the successful development of technologies and their transfer for socio-economic benefits and commercial exploitation by industry.

Now therefore, in consideration of the promises and mutual covenants hereinafter contained, the parties hereto agree as follow:

1. Subject to the conditions hereinafter contained ICAR agrees to assign to 'XXXX' on a case to case basis inventions/technologies/processes free from encumbrances developed by ICAR including the patents relating thereto (where the technology/process has already been patented by ICAR), for the sole and absolute right of licensing and commercial exploitation by 'XXXX'.
2. ICAR also agrees to provide 'XXXX' technical and engineering know-how relating to such inventions/processes/technologies consisting of documented technical information on the mode of working and using the same by an industry, as may be necessary to commercialize the said inventions/processes/technologies and associated patents, by 'XXXX'.
3. For processes licensed by 'XXXX', ICAR agrees to provide a demonstration of the process to the licensee at ICAR/R&D institution on the laboratory scale or any larger scale on which the process may have been developed by ICAR, within 30 days of the date of signing of the license agreement by the licensee with 'XXXX' to familiarize appropriately qualified personnel of the licensee and provide expert assistance to the licensee for implementation of the licensed process/invention/technology.
4. 'XXXX' agrees to give wide publicity to the availability of the processes assigned to it by ICAR for commercial exploitation and also agrees to generate necessary market data/profiles, pre-feasibility, feasibility and project reports, to promote speedy and effective licensing and commercialization of the said processes.
5. In consideration of the assignment, provision of technical information and documentation and technical services as aforesaid by ICAR, 'XXXX' agrees to remit to ICAR 70% of the entire fees received by it from the licensees arising from the said commercial exploitation of the processes of ICAR assigned to 'XXXX'. The royalties payable to ICAR shall continue for a fixed period agreed between 'XXXX' and the licensee, and 'XXXX' will apply its well established and time tested methods of monitoring the extent of exploitation of the said process(es), to ensure full and effective payment of royalties by the licensee concerned.
6. The premia and the royalty agreed upon by 'XXXX' and the licensee and the period of licensing will be finalized by 'XXXX' in consultation with ICAR.
7. In view of the cooperation provided for under this Memorandum of Understanding, 'XXXX' agrees to advise ICAR and render all possible assistance to ICAR in the filing of patent applications (both in the country and abroad) on inventions/processes /technologies which ICAR assigns or proposes to assign to 'XXXX' for licensing on the understanding that when the said patents are registered, ICAR would assign those patents to 'XXXX' for commercial exploitation.
8. 'XXXX' agrees to bear all the expenses in obtaining the patents in India on the processes assigned to 'XXXX'.
9. In case the patents/copyrights are to be taken in any foreign country, the expenses for the same will be shared between ICAR and 'XXXX' in the ratio of 50:50. The countries in which the product or the process is to be patented will be

- decided through mutual discussions between 'XXXX' and the ICAR. All incomes accruing from licensing to industry of such patents/copy-rights, shall be shared between 'XXXX' and ICAR in the ratio of 30:70.
10. 'XXXX' agrees to maintain at its own expense all patents obtained in India relating to technologies/inventions assigned to 'XXXX', whether such patents and associated processes have been licensed by 'XXXX' or not.
 11. 'XXXX' agrees, in case of revocation proceedings against a patent assigned to it by ICAR to protect it at its expense the title of the said patent and underlying invention/process/technology.
 12. 'XXXX' agrees to take all measures in its control to oppose Indian Patent applications filed by other parties which applications may be detrimental to the processes assigned to 'XXXX' by ICAR and ICAR agrees to provide 'XXXX' all assistance in this regards.
 13. In the event of any of the aforesaid patents assigned to 'XXXX' being infringed and 'XXXX' initiating or instituting any legal proceedings to prevent such infringement, ICAR agrees, if so required by 'XXXX', to render all assistance to 'XXXX'. The expense in this regard will be borne by 'XXXX'.
 14. In case 'XXXX' does not commercialize the assigned technologies within five years from the date of signing this Memorandum of Understanding with ICAR, the parties shall meet and decide on the further course of action and, if there are no immediate prospects of commercialization, the assigned technologies shall be reassigned to ICAR and 'XXXX' shall not use the information relating to such technologies in any manner whatsoever, thereafter.
 15. If either party fails to fulfill its respective obligations as set out in the previous clauses of this MOU, both parties shall urgently consult one another with a view to correcting the default by the party concerned. If even thereafter the default is not rectified by the defaulting party, the other party may terminate this MOU by giving thirty (30) days notice in writing to the defaulting party provided that such termination shall not affect the rights of the parties to MOU which have been accrued prior to such termination.
 16. Upon such termination as set out in Clause 15:
 - i. The license(s) granted by 'XXXX' shall continue for the period agreed between 'XXXX' and the licensee(s) concerned. Thereafter such Technologies assigned to 'XXXX' shall be reassigned to ICAR. 'XXXX' also agrees not to grant any further license(s) of the commercialized Technologies to any further party(ies). All amounts accrued for payment to ICAR by 'XXXX' on the date of termination shall be paid within thirty (30) days of such termination. As for payment accruing thereafter from such commercialized Technologies in respect of which license(s) have already been granted by 'XXXX' and subsisting on the date of termination of this MOU, 'XXXX' will continue to remit them to as if the MOU is in full force and effect; and
 - ii. The Technologies assigned to 'XXXX' by ICAR which have not been commercialized by 'XXXX' shall stand withdrawn and shall be reassigned to ICAR. Thereafter 'XXXX' shall not use documents of such Technologies in any manner whatsoever.
 17. In the event of any dispute or difference between the parties hereto, such dispute or difference shall be resolved amicably by mutual consultation or through the good offices of empowered agencies of the Government. If such resolution is not possible then the unresolved dispute or difference shall be referred to arbitration. The Arbitrator shall be appointed by the Director General, ICAR.
 18. This Memorandum of Understanding is valid for five years from the date of signing but may be extended for further periods by mutual agreement.
 19. This Memorandum of Understanding shall become effective on and from the date it is signed.

IN WITNESS WHEREOF, both the parties herein set their respective hands on the day, month and year first above written in the presence of following witnesses at New Delhi.

()
 Managing Director
 'XXXX' xxxxxx

()
 Director General,
 Indian Council of Agricultural Research, *New Delhi*

WITNESSES

1. _____

Name :
 Address :

2. _____

Name :
 Address :

WITNESSES

1. _____

Name :
 Address :

2. _____

Name :
 Address :

Case Study on 'Solanesol from Tobacco'

Solanesol is a naturally occurring tri-sesquiterpene alcohol present in tobacco (*Nicotiana tabacum*). It is ubiquitous because of its presence in many botanical and biological species viz. *Aesculus hippocastanum*, *Morus alba*, *Arum maculatum*, *Solanum tuberosum*, birchwood, *Bombyx mori*, cream fat and butter fat. However, tobacco is the richest source of this chemical. The presence of a long chain of repeating isoprene units (nine) in the solanesol molecule makes it a valuable source material for synthesizing metabolically active quinones and other drugs. Solanesol is the starting material for synthesis of Vitamin K2, Vitamin E, Coenzyme Q9, Coenzyme Q10 and anti-cancer potentiating agent like N-solanesyl-N, N1-bis (3,4-dimethoxybenzyl) ethylenediamine. Considering the importance of solanesol in the pharmaceutical industry, utilization of tobacco or tobacco waste as a source of this chemical has attained significance. Thus, solanesol has excellent prospects in the future as drug intermediate, which has generated considerable interest in this compound, more particularly being the starting material for the production of Coenzyme Q10 (Co Q10). Clinical trials have established the important role of Co Q₁₀ in the following areas: heart ischemia, liver injury, heart failure prevention, alopecia, dysacucis, mysathenia, pulmonary emphysema, encephalosclerosis, bronchial asthma, promoting pancreatic functions and secretions, aregenerative anemia, skin synthetic function, promoting healthy gums, high blood pressure and sugar metabolism problems.

Prospects

Solanesol, extracted from tobacco leaves, with purity ranging from 17 to 90% is available in the market. The current price of solanesol of Chinese origin for 17-19% purity is US\$18 per kg and for 90% purity the price is between US\$350 - US\$530 per kg. The price of solanesol of 98% purity ranges from US\$550 to US\$1100 per kg. At present, the price of Coenzyme-Q10 is around US\$880 per kg.

It is gathered that some of the major tobacco companies and pharmaceutical companies are venturing into this activity and they are likely to set up plants for production of solanesol from tobacco/tobacco waste in Andhra Pradesh. This proposal is in on encouraging alternative uses of tobacco in view of the health risk associated with consumption of tobacco. In years to come the estimated export earnings though these products could be around Rs. 1000 crores per annum with good employment opportunities.

Present status of technologies

As solanesol is utilized in the pharmaceutical industry for preparation of drug intermediates, purity of more than 95% is required. For extraction of solanesol on an industrial scale, there are two obvious routes viz., 1) hexane extraction followed by enrichment methods and 2) methanol extraction and fractional crystallization. Solanesol and its esters can be extracted with hexane along with other lipids but enrichment of the hexane extract containing 10-15% solanesol presents many problems and is cumbersome. Similarly, methanol extraction and cooling of the extracts results in a fraction containing about 50% solanesol which can be enriched to about 75% by recrystallisation. Techniques like centrifugal liquid partition chromatography using hexane as a stationary phase and a hydrous alcohol such as methanol, ethanol etc. having 5-10% water content as mobile phase, fractional crystallization, molecular distillation, ultrafiltration followed by membrane evaporation, gel permeation chromatography and column chromatography involving selective gradient elution of the principal compound using alumina, silicic acid or florisil as adsorbent are being employed for extraction and purification of solanesol.

Process developed at CTRI

The simple process developed at CTRI for the recovery of > 95% pure solanesol from an overall recovery of 75% from tobacco green leaf/ tobacco cured leaf/ tobacco waste and crude extracts involves solvent extraction, enrichment of solanesol in the extract by cooling at low temperature, further enrichment using a suitable adsorbent and isocratic elution with a solvent followed by recrystallization from a solvent mixture at low temperature. The combination of adsorbent and solvent for elution of solanesol, substantial reduction in adsorbent requirement and regeneration of adsorbent for reuse contribute to the novelty of the process.

The main advantages of the process are:

1. Extraction with a polar solvent and subsequent enrichment by cooling makes further purification of > 95% solanesol easy. The process/product can be utilized in drug development.
2. Economic viability of the present process is enhanced by the adsorbent used, substantial reduction in adsorbent requirement as compared to conventional column chromatography, single solvent employed to elute the compound as against solvent mixtures reported in the literature and regeneration of the adsorbent

for reuse, avoiding cost-intensive techniques like centrifugal liquid partition chromatography, molecular distillation, ultrafiltration followed by membrane evaporation, gel permeation chromatography etc.

3. Adaptability for processing tobacco green leaf or cured leaf or waste or crude extracts for extraction of pure solanesol, thus enlarging the raw material base.

Impact

The viable technology developed at CTRI for recovery of solanesol and identification of varieties rich in solanesol has significantly enhanced the scope for alternative uses of tobacco. Considerable interest has been generated in this work and nearly a dozen entrepreneurs from Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Gujarat and Rajasthan have shown interest in the technology.

One of the largest pharmaceutical companies in the country, from Mumbai, approached CTRI with a concrete proposal for commercialization of the bench-scale technology after successful completion of pilot-plant studies in a collaborative mode utilizing the infrastructure/facilities available with the company. An MOU was developed to implement the proposal.

Patenting and Commercialization

The patent application (No.1071/DEL/2003) was filed on 25.10.2002 and notified in the Gazette of India on 1.2.2003. However, delay in the grant of patent came in the way of commercialization of the technology.

Remarks ...

In so far as commercialization is concerned, it could go ahead as patent application is already filed. There is know-how/information with CTRI which is not available in the patent document but it is valuable for up-scaling/ commercial scale production of the technology. CTRI can negotiate/bargain for a handsome license fee and royalty. It may agree to demonstrate the technology/up-scaling process to the potential licensee/client only under a confidential agreement with them.

Annexure 11**Case File of a Granted ICAR Patent**

(Idea is to illustrate how change in title and claims was incorporated to revise the application till it was found in order for acceptance by the patent office)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| 1. Title of the Invention | |
| i. <i>Original</i> . Bacterial Fortified Mushroom Spawn for Oyster Mushroom (<i>Pleurotus</i> sp.) Cultivation (F.No. 1(12)/2000-IPR) | |
| ii. <i>Revised</i> . A Process for Producing a Mushroom Growth Promoting Agent | |
| 2. First Correspondence from Institution (NRC on Mushroom, Solan). | March, 2000 |
| 3. Provisional Application submitted to the Institute by the Inventor. | 30 September 2000 |
| 4. Provisional Application filed by ICAR at the Patent Office. | 4 April 2001 |
| 5. Patent Application Number. | 457/DEL/01 Dt.4.4.01 |
| 6. Complete Specification submitted by the Inventor | 14 March 2002 |
| 7. Complete Specification filed by ICAR at the Patent Office | 18 March 2002 |
| 8. Revised Claims submitted | 1 August 2003 |
| 9. Application found in Order for Acceptance by the Patent Office | 2 December 2003 |
| 10. Patent Granted | 27 January 2006 |
| 11. Patent Number | 193331 |
| | (457/DEL/01) Dt. 4.4.01 |
| 12. Patent Recorded in Register of Patents | 16 February 2006 |
| 13. Communicated by Patent Office to ICAR | 21 February 2006 |
| 14. Number of Examination Reports responded to | Two |
| 15. Remarks | i. Title was Changed
ii. Claims were changed twice |
| 16. Claims made in Provisional Application (30.9.2000) | |

I claim that the findings mentioned in the process of production and in detail in abstract are totally new and with new concept. Till date the autoclaving treatment is employed to eliminate all microbial population and providing fungal mycelium a competition free growing environment in the absence of other microorganisms.

In the present finding the artificial inoculation of yield promoting bacterial culture not only refuse the earlier theory of eliminating all sorts of microorganisms but also give new thought to the process of spawn preparation, where spawning with fortified spawn led to more uniform mycelium run in inoculated mushroom substrate bags and significantly higher mushroom yield than spawning with ordinary spawn. The spawn substrate was found to support the simultaneous growth of both the mushroom mycelium as well as the inoculated bacterium without affecting the mushroom yield, which contradicts the exhaustive sterilization treatment, given during the oyster mushroom spawn preparation process.

Comments: The claims are not properly written. Nevertheless, it is not required to essentially submit the Claims part in a provisional application.

17. Claims made in the First Filed Complete Application (18.3.2002)

I/We Claim

1. A process for screening particular bacteria having ability for their stimulatory activities under *in vitro* conditions for oyster mushroom (*Pleurotus* spp.) mycelial growth and fruit body initial and a process for preparing in a predetermined way the bacterium fortified oyster mushroom spawn having attributes like stimulated faster and uniform mushroom mycelial spread on wheat straw based mushroom substrate, controlled mushroom substrate infection from competitor moulds and giving higher mushroom yields on wheat straw based substrate.
2. A process wherein the most optimal growth requirements of particular bacteria of claim 1 found with their stimulatory activities under *in vitro* conditions for oyster mushroom (*Pleurotus* spp.) mycelial growth and fruit body initial were met from a definite volume in presterilized mushroom medium say 2 to 4 ml, a definite type of medium say wheat straw based mushroom substrate, and a definite temperature range, say fro 20 to 24°C.
3. A process of claim 1 wherein the potential bacterium was inoculated in its mycelium inoculated grain based spawn substrate and incubated at a definite temperature say 18 to 24°C, for preparation of master

culture/spawn for further propagation of mushroom as well as the bacterium inoculum and to use such spawn further as source of inoculum for preparation of commercial spawn.

4. A process of claim 3 which is efficient for a good quality mycelium spread on wheat straw based substrate, total mushroom production and nonappearance for competitor moulds on the substrate.

18. Examiner's remarks on Claims and other salient remarks in the First Examination Report

1. Subject matter of claims does not constitute an invention under section 2(i)(j) of the Patents Act, 1970.
2. Claims do not sufficiently define the invention.
3. Claims are not clearly worded.
4. Title is inconsistent with opening description and claims.
5. Title is not precise.
6. The distinguishing features as compared with prior art given are not clear.
7. The invention falls under food category, etc.

19. Revised Claims (1.8.2003)

I/We Claim:

1. A method of producing a mushroom growth promoting agent comprising the steps of:
 - a. inoculating a sterilized grain based mushroom mycelium containing substrate with bacteria such as herein described,
 - b. incubating the substrate for 10 to 20 days at 22 to 24°C to obtain a fortified population, and
 - c. isolating the population from the substrate and optionally drying it to obtain a mushroom growth promoting agent.
2. A method as claimed in claim 1 wherein mycelium is *Pleurotus* sp.
3. A method as claimed in claim 1, wherein the bacteria are selected from *Bacillus megaterium*, *Alcaligenes faecalis*, *Bacillus circulens-I*, *Bacillus circulens-II*, and *Bacillus thuriengensis*.
4. A method as claimed in claim 1, wherein ratio of mycelium to substrate is 1:60 w/w.
5. A method as claimed in claim 1, wherein ratio of bacteria to substrate is 1:250 w/w.
6. A method for producing a mushroom growth promoting agent substantially as herein described with reference to the examples and drawings.

20. Examiner's remarks on Revised Claims (1.9.2003)

1. Revised claims still do not define invention sufficiently and fall within the scope of under section 3(h) and 3(c), etc.

21. Further Revised Claims (Back dated in compliance with instructions from the Examiner)



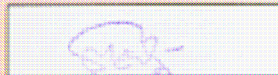
I/We Claim:

1. A process of producing a mushroom growth promoting agent comprising the steps of:
 - a. inoculating a sterilized grain based substrate with bacteria such as herein described,
 - b. incubating the above substrate for 10 to 20 days at 22 to 24°C to obtain a mushroom growth promoting agent, wherein the ratio of bacteria to substrate is 1:250 w/w.
2. A process as claimed in claim 1, wherein the bacteria used are such as *Bacillus megaterium*, *Alcaligenes faecalis*, *Bacillus circulens-I*, *Bacillus circulens-II*, and *Bacillus thuriengensis*.
3. A process for producing a mushroom growth promoting agent substantially as herein described with reference to the examples and drawings.

22. Observations/Remarks ...

For the same invention the patent could or could not be granted but for some very tricky techno-legal illustrations and inferences. In this case, the specific reference to 'method of cultivation' from the title had to be conspicuously removed and similarly the word 'method, in the claims had to be replaced with 'process'. Nevertheless, the other finer parts in the revision, which have added value to the claims vis-à-vis patent also need to be carefully noted/understood and applied by the scientists/innovators in their patent proposals.

A Sealed ICAR Patent on Azadirachtin

	
INTELLECTUAL PROPERTY INDIA PATENTS DESIGNS TRADEMARKS GEOGRAPHICAL INDICATIONS	GOVERNMENT OF INDIA THE PATENT OFFICE
PATENT A-DLA 0625 (RULE-74)	
No. <u>190802</u> of <u>12-11-1998</u> <u>2008</u>	
WHEREAS <u>THE DIRECTOR GENERAL, INDIAN COUNCIL OF AGRICULTURAL RESEARCH, INDIA, KRISHI BHAWAN, DR. RAJENDRA PRASAD ROAD, NEW DELHI-110 001</u>	
<u>has/have declared that he is/they are in possession of an invention for, an improved process for the preparation of powdered azadirachtin-a rich concentrates of neem.</u>	
<u>and that he is /they are the true and first inventor(s) thereof (or the legal representative(s) or assignee(s) of the true and the first inventor) and that he is/they are entitled to a patent for the said invention, having regard to the provisions of the Patents Act, 1970, as amended and that there is no objection to the grant of a patent to him/them;</u>	
<u>And whereas he has/they have , by an application, requested that a patent may be granted to him/them for the said invention;</u>	
<u>And whereas he has /they have by and in his complete specification particularly described the said invention and the manner in which the same is to be performed;</u>	
<u>Now, these present(s) that the above-said applicant(s) (including his/their legal representative(s) and assignee(s) or any of them) shall, subject to the provisions of the Patents Act, 1970, as amended and the conditions specified in Section 47 of the said Act, and to the conditions and provisions specified by any other law for the time being in force, have the exclusive right to prevent third parties from making, using, offering for sale, selling or importing for those purposes the</u>	
<u>and using the APPROVED process for the preparation of powdered azadirachtin-a rich concentrates of neem, offering for sale, selling or importing for those purposes the product obtained if any, directly by that process in India, provided that the product obtained if any is not a product in respect of which no patent shall be granted under this Act for a term of twenty years from the twentieth day of November, 1998 20, and of authorizing any other person to do so, subject to the conditions that the validity of this patent is not guaranteed and that the fee prescribed for the continuance of this patent be duly paid.</u>	
<u>In witness thereof, the Controller has caused this patent to be sealed as of the twentieth day of November, 2008 20, 1998</u>	
* =a rich concentrates of neem	
Controller of Patents	
Date of Sealing <u>18-03-2004/28th Phalgun, 1925(Saka)</u>	
Note: The fees for renewal of this patent, if it is to be maintained, will fall due on..... day of 20....., and on the same day in every year thereafter.	

Annexure 13**A Case Law on Patenting of Microbiological Invention¹³³**

(Courtesy: Patent Facilitating Centre, TIFAC, Govt. of India <<http://www.pfc.org.in/info/case.htm>>)

A landmark decision has been awarded by the Calcutta High Court on 15th January, 2002 in respect of patenting of inventions involving micro-organisms. The case was filed by Dimminaco A.G. against the decision of the Controller General of Patents, Designs and Trademark.

The Appellant had filed a patent application for an inventive process of preparing infectious Bursitis vaccine. The application was turned down by the Patent Office on the ground that the process did not constitute an invention under the Act. No reason(s) was assigned for this decision. The Court took a serious note of the fact that quasi-judiciary duties of the office had not been adequately discharged.

During the arguments before the Court, the Patent Office maintained that an inventive process must lead to an article or a substance. An article according to the Patent Office implied material thing, item, a thing of a particular class or kind as distinguished from a thing of any class or kind. It was further argued that only an inanimate object can be denoted as a thing or item and not a living one. It was therefore concluded that a vaccine with the living organism could not be considered substance. Hence, the process of preparing a vaccine having a living entity cannot be considered 'manufacture'. The appellant argued that the terms 'manufacture' and 'substance' had not been defined in the Act and therefore one would have to rely on the meaning provided in a dictionary. The appellant also brought to the notice of the Court that the Patent Office on earlier occasions had accepted applications in respect of new processes which included cells, virus and other microorganisms.

The Patent Office submitted that all the patents mentioned above involved lyophilizing which means freeze drying which was interpreted by the Patent Office as death of the microorganism. However, it was found that the lyophilizing put the microorganisms in dormant state which did not necessarily mean death of microorganisms.

The Court held the following:-

Controller erred himself in law by holding that merely because end product contains live virus, process involved is not an invention. And as there is no statutory meaning of 'manufacture', dictionary meaning should be accepted which does not exclude a vendible product containing living organism from it.

The claims of the patent should have been considered by Controller on principle of Section 3 of Patent Act. No objection was raised by the Examiner under Section 3.

The order passed by the Controller that the process does not lead to manufacture of substance also cannot be accepted as it leads to vendible product. It is certainly a substance after going through the process of manufacture.

From the records placed it is already clear that patent has been granted by authorities where end product contains living virus. But the respondent's stand that lyophilizing means killing of living cells cannot be accepted. As even the dictionary meaning explains it as freeze drying. It is a preservation technique in which nothing is killed or destroyed. (Ref. Willey's Encyclopedia of Food Science & Technology, Vol. II pg., 1106 & 1107 and Vol. III pg., 1633).

Learned counsel for respondent had argued in desperation that if on investigation it is found that end product of patents so granted contain living virus, Controller will take steps for revocation of grant of aforesaid patents. However the said stand is contrary to law as revocation of grant of patent is governed under Section 64. According to it, procedure for revocation can be initiated on: a) petition by an interested party, b) petition by central Government, c) on a counterclaim in a suit for infringement of patent.

Therefore, this submission is not acceptable to Court. In light of this the Order of Controller is quashed and appeal allowed. Court also said that the application of the petitioner may be reconsidered for grant of patent as early as possible, but no later than 2 months from production or service of this judgment on them.

¹³³ The judgement opened up new opportunities for obtaining patents in India on microorganism related inventions which were hitherto not granted. Further, the importance of definitions in the Act was clearly brought out. The law cannot be left to the interpretation of individuals. There has to be a consistent interpretation which should follow some logic.

Experience of DOR for Commercialization of 'Bt' Technology

Non-availability of effective bio-control agents is one of the major constraints in large scale adoption of IPM practices. *Bacillus thuringiensis* (Bt) is one of the most important pest management options that can easily be integrated into IPM since the efficacy is not much dependant on environmental conditions. Bt has been the most widely used and successful microbial (biological) insecticide ever registered. However, its prohibitive cost coupled with lack of ready availability discourages the use of Bt in pest management. Bt is currently being produced only by the well-established multinational companies, primarily due the capital-intensive nature of the production and hence the higher cost of the commercial formulations. Timely availability of Bt to the Indian farmers at affordable cost can be a reality if a cost-effective protocol with low capital investment is developed to encourage localized production to cater to the local requirement and also through simultaneous transfer of the production technology to the industry for ensuring availability at the national level.

Technology

A protocol developed for the cost-effective production and formulation of the insect pathogenic bacterium *Bacillus thuringiensis* on the principle of solid-state fermentation by DOR in a collaborative project has been identified for commercialization. Technology has been developed with the objective of making Bt available at an affordable price to the resource-poor farmers of Mahaboobnagar and Nalgonda districts of Andhra Pradesh. Requests from industry has led to contemplating on transfer of the technology through commercial route.

Project Initiation

In 1996, the castor semilooper was identified as a major constraint in castor cultivation. Based on the information available, use of Bt for castor semilooper management was proposed as a potential, viable option.

In order to encourage and enable the large-scale field use of Bt for castor semilooper management in the dryland region, efforts were initiated to explore the possibility of developing a protocol based on the principle of solid-state fermentation that is not capital-intensive and could have greater potential for adoption as a cottage industry. A simple protocol was developed using the locally available materials as the ingredients for Bt multiplication. Bt could be produced at a cost of Rs.200/- per kg approximately. The cost of Bt required for one acre worked out to Rs.30/- per spray on castor. The cost of pest management was lowered 3 to 6 fold in comparison to commercial Bt formulations and 60-70% compared to chemical insecticides. The product usage is now being extended to other crops. Most important is the fact that the technology developed can do away with the dependence on commercial Bt formulations/chemical insecticides and enable Bt production locally thus ensuring its ready availability.

Patent

A joint patent application was filed with provisional specification in July 2002 and the complete specification was filed in September 2003.

Commercialization Process

The cost-effective nature of the production technology, particularly the ability to promote the localized production can bring Bt in the reach of the resource poor farmers and encourage its inclusion in most of the IPM programmes. Medium scale industrial firms have been approaching DOR for the purchase of the technology. The DOR contemplated upon commercializing the technology. Since the technology was developed under external funding, its commercialization required action that did not violate the MOU. Taking into consideration the patent application filed for the Bt production process and the MOU, it was essential to first obtain a letter of consent from the funding agency to commercialize the production technology. Accordingly, consent of the funding

agency was obtained. It was to assure that the activities of production and marketing will in no way affect the activities of the local units in two districts as per the original understanding.

As part of the commercialization, apart from the know-how of the production technology, DOR intended to provide the culture of the effective local Bt isolate DOR Bt-1 along with the data generated with its formulation in tune with the registration guidelines at a price of Rs.1,00,000/- for the production methodology and Rs.50,000/- for the Bt isolate along with the data to enable the companies/entrepreneurs to seek registration from the Central Insecticides Board. The sale price for the production technology and data generated for registration was fixed by the resource generation committee in a meeting held along with an outside expert as a special invitee. The sale of the technology was stipulated on non-exclusive basis. Interested (potential) licensees were invited through advertisement in the national newspapers.

Problems faced and their impact

Delay in commercialization could lead to outdated of the technology thereby lowering its value as well as the demand. The primary constraint faced in this case has been the inordinate delay in issuing concurrence.

Observations/Remarks ...

The technology was commercialized through non-exclusive licences as stipulated in these guidelines. Pricing of the technology has been determined at DOR with the help of an expert panel including outside expert, and on a judgment basis. The present guidelines support this approach.

Technologies developed by IVRI – Their IPR Protection and Commercialization

(Two cases of low cost technology generation, protection and commercialization through NRDC)

1. “IVRI Crystoscope” as a field tool for determining optimum insemination time in animals

To gain the optimum reproduction and production in animals it is essential that female animal should come in heat regularly and also should have its successful conception. But the lack of proper knowledge for ascertaining optimum time of mating either for natural service or artificial insemination is the main problem in informal and formal dairy sector. This situation results in multifaceted economical losses and that of animal health i.e. gynecological disorders. "IVRI Crystoscope", a cost effective ICAR technology can be readily used to overcome this problem.

Technology

To make use of typical fern pattern of cervical mucous in inseminology, i.e. for optimizing the insemination time, a simplified, first of its kind instrument was developed at IVRI. This instrument is used to visualize the pattern of cervical mucous for its application in field. It may be a typical pattern, an atypical pattern or nil pattern. The typical fern pattern has been observed in fertile oestrus or ovulatory heat whereas atypical fern pattern (i.e. very moderate and smaller branches with lesser intensity) indicates that animal is having very low level of fertile oestrus. In case of nil fern pattern, (i.e. no branches of fern) there is no chance of conception. The "IVRI Crystoscope" is used for easy diagnosis of oestrus. A plastic sheet on the instrument carries a fern pattern calendar in which true photo of all three test slides viz. typical fern pattern, atypical fern pattern and nil fern pattern are indicated with green colour. The true photographs are used to test cervical mucous slide on test animal on the basis of matching. For this purpose, a provision of light through hollow barrel is made. Posterior end of this barrel is having a magnifying glass for viewing the tested slides. The instrument is powered by two pencil batteries (1.5 volts each) for providing sufficient light to visualize the test slide. 62.5% success rate is expected when an animal is allowed to conceive while showing the typical fern pattern. Under on-going insemination practices, mean conception rate is only 35.29%.

Advantages of the Technology

No such type of the methodology/crystoscope is available in India or abroad. As we are having 240 millions cattle and 83 million buffaloes, out of which a good population of animals remained on oestrus, which requires insemination at right stage of oestrus. Hence the technology developed has profound economic significance.

- i. The production of technology is economical and technology is viable. Insemination of animals is an on-going activity which is essential to enhance the economic status of farmers and increase production.
- ii. This instrument is cheaper, durable, can be used on large number of animals, and does not require special skills for its use. It has to be protected from water and direct sunlight but still it is easy to maintain.

Method of Manufacture

It is not a complicated design and is easy to manufacture in local market. The cost of manufacturing is around Rs. 224/- per instrument, which may be cheaper on a larger scale.

Impact of the Technology

The field application of the technology has improved the conception rate from 35.29 to 62.5 per cent, clearly indicating a 1.77 fold increase of average fertility by using this technique. Industrialists/farmers/organizations have shown their interest in the technology. Therefore, the equipment needs large scale production and marketing among a large population of Indian consumers including farmers/dairy owners/field veterinarians throughout India.

Technology Protection, Commercialization and Benefit Sharing

The technology was registered for patent grant vide application No. 944/DEL/2002 dated 17.09.2002. It has been commercialized through NRDC to 3 pharmaceuticals companies at a license fee of Rs. 2 lakh each as lump sum and 5% royalty on annual sale basis for 15 year for this. Out of this 30% share would go to NRDC and 70% to the Institute. Out of the institute share, 50% would be distributed among the scientists/innovators, 30% will go to technical & supported staff, 15% among concerned officials working for patent and commercialization and remaining 5% will be for staff welfare fund (As per Johl, Committee Guidelines).

2. “Area specific mineral mixture for Uttar Pradesh to increase productivity of bovines in respect of milk yield and body weight”

The technology, ‘Area specific mineral mixture for Uttar Pradesh to increase productivity of bovines in respect of milk yield and body weight’ was registered for patent grant vide application No. 1399/DEL/2003. This technology has also been commercialized through NRDC @ Rs. 2 lakh each as lump sum in 4 cases and @ Rs. 3 Lakh each for 3 Pharmaceutical houses along with a 5% royalty on annual sale basis for 15 years. Sharing of commercial benefits will be as per the Johl Committee Report. As Such, this technology is very much in demand in farmer’s community as they are getting positive response of this technology.

Remarks ...

IVRI may also share the experiences and approach of CIAE towards commercialization of small tools and farm machinery for wider dissemination. The ICAR (CIAE) registers potential enterprises at the institute at a nominal fee and transfers the technology through several non-exclusive licenses.

Annexure 16**Proforma¹³⁴ for IP Data Base at ICAR Headquarter**

(Information to be furnished by each institution (ITMU/ZTMC) with effect from 1.1.1995 *)

Name of the Institute/Bureau/PD/NRC

A. Patents

S. No.	Date of filing Application in Patent Office (provisional/ complete)	Application Number allotted by the Patent Office	Title	Innovator(s)	Status of Application (Disposed of/Pending)	Date of Patent grant, if so	Whether Commercialized or not	If Application pending in Patent Office, reasons thereof
1	2	3	4	5	6	7	8	9

* Information on Patents obtained prior to this date can also be given, if available with the Institute. Information of patent applications where available, may be given. It may be tallied at ICAR headquarter

B. Other IPs

S. No.	Date of filing Application with relevant authority under Law	Application/ Regn. Number	Title	Innovator(s)	Status of Application (Disposed of/Pending)	Date of IP Grant (if so)	Whether IP commercialized or not	If Application pending with the Authority, reasons thereof
1	2	3	4	5	6	7	8	9

C. Information on Protection of Plant Varieties shall be added in similar columns as and when applicable.

Proforma for Quarterly Report on cases considered by the Institute Technology Management Committee (ITMC)

Name of the Institute/Bureau/PD/NRC:

S. No.	Date of submission of application to the ITMC	Name of the Innovator and subject of innovation	Date on which considered by the ITMC	Whether Recommended for securing patent/ PVP/ other IP* or for forwarding to ICAR HQ for specific advice or none of these	If not, reasons in brief
1	2	3	4	5	6

* Specify in case any IPR is to be obtained

¹³⁴ Suggestive only

Application Form (Patents)
(Current Version¹³⁵)

FORM 1 THE PATENTS ACT 1970 (39 of 1970) & THE PATENTS RULES, 2003 APPLICATION FOR GRANT OF PATENT [See section 7, 54 & 135 and rule 20 (1)]		(FOR OFFICE USE ONLY) Application No: Filing Date: Amount of Fee Paid: CBR No: Signature:		
1. APPLICANT(S)				
Name	Nationality	Address		
Indian Council of Agricultural Research (ICAR)	Indian	Krishi Bhawan, 1, Dr. Rajendra Prasad Road, New Delhi – 110 001		
2. INVENTOR(S)				
Name	Nationality	Address		
1. abc	Indian	Institute address		
2. xyz	Indian	Institute address		
3. TITLE OF THE INVENTION				
4. ADDRESS FOR CORRESPONDENCE OF APPLICANT/AUTHORISED PATENT AGENT IN INDIA The Director, Institution Name, (Indian Council of Agricultural Research) Address, Place – PIN, State			Telephone No. ... Fax No. ... Mobile No. ... E-mail: ...	
5. PRIORITY PARTICULARS OF THE APPLICATION (S) FILED IN CONVENTION COUNTRY				
Country	Application Number	Filing Date	Name of the Applicant	Title of the Invention
...
6. PARTICULARS FOR FILING PATENT COOPERATION TREATY (PCT) NATIONAL PHASE APPLICATION				
International application number	International filing date as allotted by the receiving office			
...	...			
7. PARTICULARS FOR FILING DIVISIONAL APPLICATION				
Original (first) application number	Date of filing of Original (first) application			
...	...			
8. PARTICULARS FOR FILING PATENT OF ADDITION				
Main application/patent Number	Date of filing of main application			
...	...			
9. DECLARATION:				
(i) Declaration by the inventor(s)				
I/We, the above named inventor(s) is/are the true & first inventor(S) for this invention and declare that the applicant(s) herein is/are my/our assignee or legal representative,				
(a) Date.....				
(b) Signature(s) ...				
(c) Name(s) ...				

¹³⁵ Check the current version of Application Form as per Patents Act

- * Tick (√)/Cross (x) whichever is applicable/ not applicable in declaration in para 9.
- * Name of the inventor and applicant should be given in full, family name in the beginning.
- * Complete address of the inventor and applicant should be given stating the postal index no./code, State and country.
- * Strike out the column which is/are not applicable
- * For fee: See First Schedule.

----- (Next Page) -----

Annexure

To

The Director,
Institution Name,
(Indian Council of Agricultural Research)
Address,
Place – PIN (State)

Subject: Undertaking and Declaration in regard to Invention made by the undersigned.

In regard to the invention made by me/us and my/our request to forward the proposal for filing application for Patent, we reiterate the following facts:

- i) That the title of our invention is
- ii) That the invention made by us is completely new and is on account of inventive steps taken by us. It has not been published.
- iii) There is no lawful ground of objection to the grant of patent in respect of our invention.
- iv) I/We have perused the available literature on the subject and I/We confirm that no invention has been made by any person of the type mentioned an item no. (i) above.
- v) I/We undertake to keep you posted of developments in regard to correspondence/business discussion if any, pertaining to the above mentioned invention, in future.
- vi) I/We give below the declaration for assignment of rights to ICAR.

2. In view of the above facts, I/We request you to kindly expedite the filing of the application.

Yours faithfully,

Date

Place

Name(s) of Inventor(s)

1. Name (Signature)

2. Name (Signature)

.....

Copy to: The DDG (.....) Indian Council of Agricultural Research, Krishi Bhawan, New Delhi – 110001.

----- (Next Page) -----

DECLARATION BY INVENTOR(S)

I/We (Name(s) of Inventor(s) with Designation and Address) declare that all rights for the invention (Title of Patent as given in the Application) are assigned by me/us to the applicant “Indian Council of Agricultural Research (ICAR), Krishi Bhawan, 1, Dr. Rajendra Prasad Road, New Delhi – 110001.” and the application is signed on behalf of the assignee by the authorized official of ICAR.

Dated thisday of 200...

INVENTOR NAME

SIGNATURES

Witnesses (Two):

Name

Designation

Signatures

1.

2.

FORM 2
THE PATENT ACT 1970
(39 of 1970)
&
THE PATENTS RULES, 2003
PROVISIONAL/COMPLETE SPECIFICATION
(See section 10 and rule 13)

1. TITLE OF THE INVENTION ...

2. APPLICANT(S)

(a) Name: Indian Council of Agricultural Research (ICAR)

(b) Nationality: Indian

(c) Address: Krishi Bhawan, 1, Dr. Rajendra Prasad Road, New Delhi – 110 001

3. PREAMBLE TO THE DESCRIPTION

PROVISIONAL

The following specification describes the invention

COMPLETE

The following specification particularly describes the invention and the manner in which it is to be performed

4. DESCRIPTION (Description shall start from next page)

...

5. CLAIMS (not applicable for provisional specification. Claims should start with the preamble -- “I/we claim” on separate page)

...

6. DATE AND SIGNATURE (to be given at the end of last page of specification)

()
Director,
Institution Name,
(Indian Council of Agricultural Research)
Address,
Place, PIN, State

7. ABSTRACT OF THE INVENTION (to be given along with complete specification on separate page)

...

Note-----

- * Repeat boxes in case of more than one entry.
- * To be signed by the applicant(s)
- * Name of the applicant should be given in full, family name in the beginning.
- * Complete address of the applicant should be given stating the postal index no./code, state and country.
- * Strike out the column which is/are not applicable.

.....(Separate sheet).....

Drawing Sheet

Indian Council of Agricultural Research

Sheet No. :

Number of Sheets :

(XXXXXXXX XXXXXX)
Director, XXXXX (ICAR)

Patent No. 183679 of 15.1.1998¹³⁶

National Institute of Research on Jute and Allied Fibre Technology (Indian Council of Agricultural Research), 12 Regent Park, Calcutta – 700 040.

A new bed for mushroom cultivation by utilizing biogas waste slurry and straw for improved mushroom cultivation

Mushroom Cultivation Technology

Biogas plant spent slurry is rich in mineral nutrients and moderately high in C:N ratio. Traditional use of spent slurry from biogas plant as manure is not a much remunerative way. Prevailing high anaerobiosis in the biogas digester reduce common plant pathogens (Gadre *et al.* 1986) to a great extent in the residual organic mass after biogas production and degrade the lignocelluloses in the spent mass considerably making them easily assimilable to the mushroom. *Volvariella* and *Pleurotus* sp. of mushroom was grown successfully on straw when supplemented with biogas spent slurry which not only increase yield of mushroom significantly but also improve its quality in terms of protein and essential mineral nutrient contents.

Mushrooms are saprophyte that grow in nature on dead organic matter. In nature the organic matter becomes the limiting factor for production of their fruit bodies.

It is well known that spent slurry coming out from biogas plant after production of biogas is rich in mineral nutrients. The residual slurry after drying has been used in agricultural fields as manure and consequent increase in crop yield has been reported (Jain 1993; Balasubramanya *et al.* 1982). The use of residual slurry/mass after biogas production from jute caddis or other organic wastes as manure could not add much income to biogas production system. Thus an alternate method was developed to utilize those semi degraded organic mass more efficiently and profitable via mushroom cultivation. It is well established that agroresidues rich in lignocellulosics components serve as satisfactory source for cultivating *Pleurotus* sp. of mushroom. Cultivation of *Volvariella* sp. has been practised conventionally on rice straw and thus popularly known as paddy straw mushroom. The maximum biological efficiency by any *Pleurotus* sp. (e.g. *Pleurotus sajor caju*) has been reported to be 100% i.e. 1 kg fresh mushroom production from 1 kg. dry rice straw (Jandaik and Sharma, 1986) whereas biological efficiency for *Volvariella volvacea* has been reported to be very low and yield is viable (AICMIP Annual Report, 1993-95).

The present invention states that supplementation of the biogas spent slurry with rice straw can increase mushroom production by 50-100% or even more for both *Pleurotus* and *Volvariella* mushroom. Proper disinfection and right management practice improved the production quality and increased yield, at the same time made biogas production technology more remunerative.

Objective of the invention

Main object of the invention therefore is to utilise the biogas plant spent slurry in a most economic and profitable way for the production of mushroom. Mushroom was conventionally cultivated on straw bed, supplementation of straw bed with biomanure improved the yield of mushroom.

Other object of the invention is pre-treatment of the seeds separately for disinfection to achieve the maximum yield of mushroom. Further object is to prepare an improved mushroom spawn for mushroom cultivation of the process and to produce a mushroom having improved protein, carbohydrate and mineral nutrient content. These and other objects of the invention can be well understood from the detail discussion of the invention that follows:

Invention therefore provides a method for producing mushroom by utilising biogas wastes slurry with straw for improved mushroom cultivation which comprises:

- a) Air drying the biogas waste slurry to a solid mass (bio-manure) and grinding the same to powder form if necessary.

¹³⁶ Unedited. This example may be viewed only as a granted patent but not a Model Patent. The Indian patent system has undergone sea changes and the quality of patents granted has increased manifolds in the recent years. Another attempt has been made to illustrate this aspect; please see Annexure 11 describing the "Case file of a granted ICAR Patent" No. 193331 (457/DEL/01) Dt. 4.4.01 where efforts were made to improve the claims part in the patent.

- b) Disinfecting the same and the straw separately by soaking them in hot water in presence of potassium permanganate and formalin solution.
- c) Placing alternate layers of thus treated straw and bio-manure to prepare the bed.
- d) Specially prepared mushroom spawns are spread in the interlayer of the two.
- e) The whole bed is covered with polythene sheet.
- f) Mushroom mycellium are allowed to grow (Spawn run) till the substrate are fully covered with dense white mycellium visible through polythene sheet.
- g) Polythene cover is then removed and water is sprayed gently and the mycellium is allowed to grow till maturity of fruiting.
- h) Water spraying is stopped after harvest and the beds are allowed to produce more fruits by repeating the process for at least 3 times to get 3 spell of crop on the same substrate.

Mushroom spawns used in the process as prepared as follows:

- a) First checking the purity of culture under a microscope.
- b) Pure culture grown in modified Potato dextrose agar slant modified by adding 1% malt extract in PDA.
- c) From agar slant the culture is transferred in modified potato dextrose broth for mother culture development.
- d) Mother culture is inoculated in previously sterilized wheat grains and incubated at suitable temperature for mycellium development. Wheat grains are washed with cold water, boiled for 20-30 minutes. Excess water is drained off dried under a blower, mixed with 0.1-1% CaCO₃ and 0.5-2% gypsum powder, packed and sterlised in an autoclave at 15 lb steam pressure for 1-2 hrs. Thus high quality of spawn is developed.

The present method is a promise in increasing mushroom yield, its protein and mineral contents. First step of the method is collection of spent slurry from biogas plant. They are air dried in shade to a solid mass. The dried biomanure is used for mushroom cultivation as a supplement with straw. Next step involved disinfection of substrate. This is done by soaking straw and biomanure separately in hot water (80-90⁰C) containing 0.05-0.5% KMnO₄ and 0.1-2% formalin overnight or for at least 18 hours. Next morning the excess water soaked in straw and biomanure is drained off.

Mushroom spawn (compact mycellium culture grown on starchy seed grains) are prepared on grains seed (viz. wheat, paddy, maize etc.) by inoculating mushroom mycellium in preboiled and cooled seed grains thoroughly mixed with gypsum powder (0.5-2%) and CaCO₃ powder (0.5-1%) packed in double polypropylene packets and autoclaved under steam pressure of 15-20 lb for 1-2 hrs. They are then incubated at respective optimum temperatures. Fully developed fresh mushroom spawns are used for spawn run. Alternate layers of straw and biomanure previously disinfected as mentioned above are used. Mushroom spawns are spread in the interlayer of straw and biomanure. Thickness of the layers should be at least 2 centimetres each. The beds are covered with polythene sheets. The beds are prepared in diffused lighted and well aerated place. Mushroom mycellium are allowed to grow till the substrates are fully covered with dense white mycellium visible through polythene sheets. Time required for growing *Pleurotus* sp. under optimum condition is 20-22 days while that for *Volvareilla* sp. is 10-12 days. At this stage polythene cover is removed and allowed to grow further for 2-3 days till budding. Water is sprayed gently on the beds after removing polythene cover till fruit bodies are mature enough (within 2-3 days) for harvesting. Generally 3-4 spell of crops are harvested on the same substrate within a gap of 10-15 days. The mushroom may be consumed in fresh condition or they may be dried for preservation and future consumption.

From actual experiment it is understood that disinfection of straw and manure with only hot water (80-90⁰C) is as good as 0.1% KMnO₄ and 1% formalin combined treatment in cold water. Disinfection with 0.1% KMnO₄ and 1% formalin in hot water further increased mushroom yield considerably (illustrated in table). In some other method an insecticide 'bavistin' has been used for disinfection of substrate. The cited method eliminated the use of harmful chemical 'bavistin'. Use of 0.1% KMnO₄ is useful in controlling tropical weed mushroom 'Coprinus' to a great extent. Moreover, important micronutrient 'Mn' is increased in mushroom by the treatment of KMnO₄. The use of biogas spent slurry not only helps in increasing yield significantly but also helps in increasing protein content in mushroom fruit bodies considerably. The minimum yield increase is 50% while maximum yield increase is over 150% in comparison to control by the use of biogas residual slurry. Fresh spent slurry gives better crop health and consequently good yield. Since biogas spent slurry is rich in mineral nutrients especially in P, K and Ca, the mushroom produce becomes richer in mineral nutrients especially in P, K and Ca besides increased protein content. So the mushroom produced by the present method is superior in nutritional quality besides increased yield.

Present method is simple and cheap with highest possible monetary return. Quality mushroom has got both internal and external market and the product if the invention is rich in mineral nutrient and protein and produces quality mushroom. Mushroom obtained by the process of the invention will therefore be able to earn foreign exchange for the country. As such this method is not only ecofriendly but also at the same time more remunerative for the cultivators.

The novelty of the process over conventional method are as follows:

1. Productive utilisation of biogas spent slurry through improved mushroom cultivation which will make biogas production more economically viable and integrated technology of biogas production and mushroom cultivation is more remunerative.
2. Increase in mushroom yield by 50-150% over traditional system of cultivation by simple supplementation of this biomanure
3. Elimination of use of insecticide like bavistin by replacing with KMnO_4 and formalin for disinfection of substrate which is also very effective in controlling tropical weed mushroom *Coprinus*.
4. Use of biomanure helps in increasing mineral nutrients. like, P.K. Ca, Fe, Zn & Cu while KMnO_4 help in increasing Mn, in the mushroom produce.
5. Use of biomanure further helps in increasing protein content in the mushroom thus improves its nutritional quality.
6. Use of chemicals KMnO_4 and formalin for disinfection of the substrate provides higher yields of mushroom.

Following experimental results have been given only to illustrate the invention and these in no way limit the scope of the invention.

Several experiments have been carried out with different type of biomanures obtained from biogas plants functioning with substrate like (a) only cowdung (b) only poultry litter (c) jute caddies and (d) municipal solid waste.

Yield of Mushroom, biological efficiency and increase of yield over control is represented in **Table I**.

Biological efficiency means the ratio of fresh weight of mushroom produced to air dry weight of straw used for spawn run.

Table I
Effect of supplementation of Biogas residual slurry manure using different substrates on yield of *Pleurotus sajor caju*.

Treatments	Yield of Mushroom (g/kg straw)	Biological Efficiency (%)	Increase over Control (%)
Only Straw (Control)	892	89.2	-
Straw + Cowdung biomanure	1455	145.5	63.1
Straw + Poultry litters biomanure	1800	180	101.8
Straw + Jute caddies biomanure	1835	183.5	105.7
Straw + Municipal Solid Waste biomanure	1555	155.5	74.3

Table II
Yield of Mushroom (*Pleurotus sajor caju*) as affected by disinfection method.

Substrate disinfected by	Yield of Mushroom (g/kg straw)
Only hot water	1150
0.1% KMnO_4 (Cold)	785
1% Formalin (Cold)	850
0.1% KMnO_4 + 1% Formalin (Cold)	1125
0.1% KMnO_4 + 1% Formalin (Hot)	1835

From the Table it is clear that treatment with 0.1% KMnO_4 and 1% formalin with hot water as disinfecting agent has increased the yield of mushroom by 60% over control.

In **table III** we have demonstrated the nutritional value of the product obtained by the process of the invention by determining protein, carbohydrate lipid and ash content of the product and comparing the same with that of the control.

Table III
Effect of major nutrient constituents in *Pleurotus sajor caju* due to supplementation of biogas residual slurry manure with rice straw (1:1).

Treatments	In percent			
	Protein	Carbohydrate	Lipid	Ash
Straw (Control)	32.17	28.81	4.73	6.21
Straw + Cowdung biomanure	41	20.21	8.08	9.79
Straw + Poultry litters biomanure	44.14	21.45	4.47	8.57
Straw + Jute caddies biomanure	33.84	25.77	5.81	12.24

Protein content of mushroom sample were determined following the method of Subhashini and Ravindranath, 1981.

Carbohydrate content were determined following the method of Saravanan, 1981 and lipid following Sadasivam & Manikam, 1982

Air dried samples were used in all the cases. The samples were dried at 550⁰ C for preparing ash. Results of table III clearly indicate that protein content of the product of the invention was increased significantly.

In **table IV** we have demonstrated the mineral nutrient content of the product as compared with that of the control.

Mushroom samples were made into ash by heating at 550⁰ C in a Muffel furnace. The ash was dissolved in 6 (N) HCl and then diluted to suitable volume. The solution were analysed for the stated elements in an atomic adsorption spectrophotometer.

Table IV
Effect of mineral nutrient content in *Pleurotus sajor caju* due supplementation of biogas residual slurry manure with rice straw (1:1).

Treatments	Elements Present								
	Ash	In percent			In ppm				
		P	Na	K	Ca	Fe	Mn	Zn	Cu
Straw	6.21	0.25	0.32	2.27	236	112	34.5	74.6	16.4
Straw + Cowdung biomanure	9.79	0.94	0.63	2.8	425	152	25	119.8	22
Straw + Poultry litters biomanure	8.57	0.57	1.01	2.78	426	167	59.9	93.3	24.1
Straw + Jute caddies biomanure	12.24	1.05	0.61	4.35	204	162	21.5	94.2	30.8

Results clearly indicates that the mineral nutrients of the product of the invention is greatly increased than that of the control.

In Table V we have demonstrated the effect of biogas waste slurry with straw on the yield of mushroom.

Table V
Effect of biogas residual slurry manure using jute caddis as substrate on yield of *Volvariella volvacea*.

Treatments	Yield of Mushroom (g/kg straw)	Biological Efficiency (%)	Increase over Control (%)
Straw (100%)	92	9.2	-
Straw + 0.1% (NH ₄) ₂ HPO ₄	118	11.8	27.3
Straw + biomanure (1:1)	150	15	62.2
Straw + biomanure (2:1)	98	9.8	6.5
Straw + biomanure (1:2)	106	10.6	42.2

It appears from the table that maximum yield of mushroom is available when the ratio of straw: manure is 1:1.

Claims

1. A method for producing improved quality mushroom by utilising biogas waste slurry with straw for improved mushroom cultivation which comprises
 - a) Air drying the biogas waste slurry to a solid mass (bio-manure) and grinding the same to powder form if necessary.
 - b) Disinfecting the same and the straw separately by soaking them in hot water in presence of potassium permanganate and formalin solution.
 - c) Placing alternate layers of thus treated straw and bio-manure to prepare the bed after removing excess water.
 - d) Specially prepared Mushroom Spawn are spread in the inter-layers of the two.
 - e) The whole bed is covered with polythene sheet.
 - f) Mushroom mycellium are allowed to grow (Spawn run) till the substrate are fully covered with dense white mycellium visible through polythene sheet.
 - g) Polythene cover is then removed and water is spread gently and the mycellium is allowed to grow till budding.
 - h) Water spraying is stopped and the beds are allowed to produce mature fruits for harvesting and the process is repeated for at least 3 times to get 3 spell of crop on the same substrate.
2. A method as claimed in claim 1 in which disinfection of bio-manure and straw are carried out separately by soaking in hot water at 80-90°C containing 0.05 to 0.5% potassium permanganate and 0.1 to 2% formalin by weight.
3. A method as claimed in claim 2 wherein time required for completion of disinfection treatment is at least 18 hours.
4. A method as claimed in claim 1 in which the thickness of the alternate layers of bio-manure and straw should be at least 2 & 5 cm respectively.
5. A method as claimed in claim 1 wherein mushroom spawn are prepared from pure culture by growing the same in modified potato-dextrose agar slant modified by adding 1% malt extract and then transferring the same in modified potato dextrose broth for mother culture development which is then inoculated in previously sterilized wheat grains and incubated at a suitable temperature for mycellium development
6. A method as claimed in claim 5 wherein before mycellium is fully developed wheat grains are washed with cold water and then boiled for 20-20 minutes, excess water is drained off, dried under a blower mixed with 0.25-1% CaCO₃ and 1-2% gypsum powder, packed and sterilized in an autoclave at 15 P.S.L. steam pressure for 1-2 hours.
7. A method as claimed in claim 1 wherein spawn run period of step (f) for *Pleurotus* sp. cultivation spawn under optimum condition is 20-22 days while the same for *Volvariella* sp. is 10-12 days.
8. A method as claimed in claim 1 wherein after spawn run period polythene cover is removed and water spraying is started as soon as the beds turn drying.
9. A method as claimed in claim 1 wherein within 2-3 days after removal of polythene cover mushroom bud start to emerge and mature for harvesting in another 2-3 days.
10. A method as claimed in claim 1 wherein the gap between 1st to 2nd & 2nd to 3rd crop on the same substrate is between 7-15 days.
11. A method as claimed in claim 1 wherein the ratio of bio-manure and straw used in the mushroom cultivation 1:1.
12. A method as claimed in claim 1 wherein the yield of mushroom is at least 60% more than the yield obtained by the conventional process using straw bed.
13. A method as claimed in claim 1 in which the product obtained by the process of the invention is richer in mineral nutrients and protein content as compared to the product obtained by conventional processes using straw bed.
14. A method for producing mushroom by utilising bio-gas waste slurry with straw for mushroom cultivation substantially as herein described and exemplified.
15. Improved quality mushroom wherever prepared by the process substantially as herein described.

THE PATENTS ACT, 1970
FORM – 1A

APPLICATION FOR PATENT WHEN THE TRUE AND FIRST INVENTOR IS THE SOLE FOR JOINT
APPLICANT/BY THE ASSIGNEE OR LEGAL REPRESENTATIVE OF THE TRUE AND FIRST INVENTOR
(Section 7)

Insert name in full, address and nationality of applicant (s)	I/We Indian Council of Agricultural Research National Institute of Research on Jute & Allied Fibre Technology), 12, Regent Park, Calcutta - 700040 West Bengal, India, An Indian Research Institution here delectate:-
Insert title	(i) that I am/We are in possession of an invention for "Method of producing mushroom by utilising biogas waste slurry with straw for improved mushroom cultivation (ii) that I am/We/the said _____ claim (s) to be the true and first inventor (s) thereof; or (ii) that I/We/the said claim (s) to be the assignee(s) of or the legal representative(s) of Dr. Shyamal Banik, an Indian Nationality, National Institute of Research on Jute & Allied Fibre Technology of 12, Regent Park, Calcutta – 700 040, West Bengal, India who claim (s) and is/are believed to be the true and first inventor(s) thereof: (iii) that the provisional. complete specification filed with this application is and (and the complete specification) and any amended specification which may hereafter be filed in this behalf will be, true of the invention to which this application relates (iv) the I/We believe that I am/We are entitled to a Patent for the said invention having regard to the provisions of the Patents Act, 1970 (v) that to the best of my/our knowledge, information and belief the facts ad matters stated herein are correct and that there is no lawful ground of objection to the grant of Patent to me/us on this application.
Insert full name, address and nationality of inventor(s)	I/We request that a patent may be granted to me/us for the said Invention. I/We request that all notices, requisitions and communications relating to this application may be sent to: DATTA & ASSOCIATES, Patent & Trade Mark Attorneys, 2, Ganesh Chandra Avenue, Calcutta- 700 013.

Dated this 15th day of January 1988.

Signature _____

To
The Controller of Patents
The Patent Office
Calcutta.

----- Page Break -----

Insert name of invention in full, address and nationality	I/We Dr. Shyamal Banik National Institution of Research on Jute & Allied Fibre Technology of 12 Regent Park, Calcutta- 700 040. referred to on the reverse of this application as claiming to be the true and first inventor(s) hereby declare that the applicant(s) who has/have signed this application on the reverse is/are my/our assignee
-----------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Dated this 15th day of January 1998

Signature _____

(Dr. Shyamal Banik)

To be signed by the true and
first inventor(s)

Signature of two witnesses along with their names and address;
1. Dr. K.K. Sen, Sr. Scientist, NIRJAF (ICAR), 12, Regent Park, Calcutta – 700 040.
2. Dr. A.K. Roy, Sr. Scientist, NIRJAF, 12, Regent Park, Calcutta – 700 040.

Committee to develop Guidelines for Intellectual Property Management & Commercialization of Technologies in the ICAR System



**Indian Council of Agricultural Research
Krishi Bhawan, New Delhi**

F.No. 1-1/2005-CMIPP-ICAR/

Dated 21st November, 2005

OFFICE ORDER

In view of the rapid developments in areas of intellectual property rights and benefit sharing in agriculture and with a view to manage ICAR's intellectual property in research and technology development; to secure benefits of public good from the outcome of ICAR research; and to share gains from commercialization in the ICAR system, Director General, Indian Council of Agricultural Research (ICAR), New Delhi is pleased to constitute a Committee with immediate effect to develop Guidelines for intellectual property management and commercialization of technologies in the ICAR system. The composition of the Committee will be as follows:

Dr. Rita Sharma	Chairperson
Additional Secretary & Financial Adviser	
Department of Agricultural Research & Education, GOI,	
Ministry of Agriculture,	
New Delhi	
Representative from Department of Science and Technology, GOI, Ministry of Science and Technology,	Member
New Delhi	
Representative from Department of Biotechnology, GOI, Ministry of Science and Technology, New Delhi	Member
Representative from Department of Industrial Policy and Promotion, GOI, Ministry of Commerce and	Member
Industry, New Delhi	
Representative from Department of Agriculture & Cooperation, GOI, Ministry of Agriculture, New Delhi	Member
Representative from Council of Scientific & Industrial Research (CSIR), New Delhi	Member
Deputy Director General (Animal Science), ICAR	Member
Deputy Director General (Crop Science), ICAR	Member
Deputy Director General (Engineering), ICAR	Member
Deputy Director General (Fisheries), ICAR	Member
Assistant Director General (IPR), ICAR	Member
Assistant Director General (Seeds), ICAR	Member
Director, National Centre on Agricultural Economics and Policy Research, New Delhi	Member
Representative from Private Sector	Member
Law Experts/Lawyers (2)	Members
Dr. Sudhir Kochhar, Principal Scientist (PB/IPR), ICAR	Member Secretary

The Terms of Reference of the Committee shall be the following:

1. To assess the status of management processes of IPR undertaken by the ICAR system and related matters,
 2. To suggest Guidelines for ownership/associate ownership, assignment and protection of intellectual property (IP) generated in ICAR's own set up or under sponsored/collaborative/grant-in aid projects in various forms of intellectual Property Rights (IPR), particularly patents, protection of plant varieties, copyright and trademarks,
 3. To suggest approaches and guidelines for licensing/commercialization of ICAR's IP/technologies,
 4. To recommend ways and means for valuation of ICAR's IP/technologies, keeping in view target groups like farmers, industry, international cooperation, foreign trade and strategic partnerships,
 5. To suggest means and methods for contracting, pricing, payment and ownership of ICAR's IP for use of the ICAR system's knowledge/technology base by foreign clients,
 6. To recommend benefit sharing mechanism, and incentive and reward mechanism in the ICAR system, and
 7. To highlight specific issues/further concerns related to agricultural research and education, which may emerge in the convergence of all the thinking, and the implementation of rules/guidelines/procedures being recommended by the Committee.
- The Committee will submit their Report by 31st December, 2005*.
- The Committee is empowered to co-opt members for individual meetings of the committee and hire need based consultants as per ICAR/DARE norms.
- T.A./D.A. will be paid to Non-Official Members as per Rules for attending the meetings of the Committee.

Sd/-

Principal Scientist (PB/IPR) & Member Secretary

Distribution:

1. Chairman and Members of the Committee
2. All ICAR institutes/bureaus/PD's/NRC's/PC's
3. All Officers/Sections in the ICAR/DARE/KAB-I&II
4. Sr.PPS to DG, ICAR
5. Guard File

Co-Opted Members of the Committee:

National Director, National Agricultural Technology Project/National Agricultural Innovation Project
Director, National Academy of Agricultural Research Management (NAARM), Hyderabad
2 Representatives of National Academy of Agricultural Sciences (NAAS), New Delhi

* The Term of the Committee was extended.

Additional Terms of Reference**ICAR Reorganization Committee, 2005 (Mashelkar Committee)****RECOMMENDATIONS**

- 5.14 The Committee after reviewing the existing ICAR guidelines recommended modifications on the following lines:
- (i) The guidelines should delineate types of intellectual property created as a result of the research efforts of the Council.
 - (ii) The guidelines should spell out a policy with regard to ownership of intellectual property created under various types of projects viz. sponsored, collaborative project and grant in aid project.
 - (iii) The guidelines should include norms for pricing of intellectual property and its licensing by various means viz. direct licensing by the institutes or through NRDC or other technology transfer agencies.
 - (iv) The guidelines should clearly delineate issue relating to contracting, pricing, payment and ownership of intellectual property in cases of exploitation of ICAR knowledge base by foreign clients.
- 5.15 A Scientist entrepreneur scheme may be developed on the lines of a similar scheme in CSIR.
- 5.16 A revenue sharing scheme for ICAR scientists engaged in research in partnership with industry may be designed and adopted.
- 5.17 Provision should be made for engagement of consultants for business development.
- 5.18 Provision should be made to enable ICAR institutes to set up business and marketing entities.
- 5.19 Provision should be made for deputation of scientists along with ICAR processes released to industry.
- 5.20 ICAR should develop farm and lab facilities to capitalize on the existing and emerging opportunities through development of seed/ sapling/ planting materials/ fingerlings in the mandated area.
- 5.21 Sector wise ICAR-industry interface meetings should be held annually.
- 5.22 ICAR may consider the feasibility of establishing core shared facilities in partnership with appropriate private sector industry sources on the pattern of CSIR.



**Indian Council of Agricultural Research
Krishi Bhawan, New Delhi**

F.No. 1-1/2005-CMIPP-ICAR/

Dated 22nd November, 2005

OFFICE ORDER

In continuation of the Council's Office Order of even number dated 21st November 2005 regarding constitution of a Committee to develop guidelines for intellectual property management and commercialization of technologies in the ICAR system under chairmanship of Dr. Rita Sharma, Additional Secretary (DARE) & Financial Adviser, a Drafting Committee comprising the following members is constituted with immediate effect.

Dr. S. Prakash Tiwari ¹³⁷ Director, NAARM*, Hyderabad	Member
Dr.M.Dadlani ¹³⁸ Principal Scientist Division of Seed Science & Technology, IARI, New Delhi	Member
Dr. S.K.Pareek Principal Scientist NATP NBPGR, New Delhi	Member
Sr. Suresh Pal Principal Scientist & I/C Consultancy Cell NCAP, New Delhi	Member
Dr. R.K.Mittal Principal Scientist (TC) ICAR, KAB, New Delhi	Member
Dr. S.Mauria ¹³⁹ Principal Scientist (CC) ICAR, KB, New Delhi	Member
Shri Rajiv Maheshwari OSD to Secy.(DARE)&DG, ICAR ICAR, KB, New Delhi	Member
Dr.Sudhir Kochhar Principal Scientist (PB/IPR) ICAR, KB, New Delhi	Coordinator

This issues with the Approval of DG, ICAR.

(SUDHIR KOCHHAR)
Principal Scientist & Member Secy.

Distribution:

1. All Members of the Committee
2. DDG (CS&H) and ADG (TC), ICAR, New Delhi
3. Directors, IARI, NBPGR and NCAP, New Delhi

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1. PS to AS&FA (DARE) for kind information of AS&FA (DARE)
2. Sr. PPS to DG, ICAR for kind information of DG

Co-opted Member of the Drafting Committee (representative of Director NAARM):
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¹³⁷ Presently Deputy Director General (Education), ICAR

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3. Dr. Nawab Ali, DDG (Engineering)
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10. Dr. Ramesh Chand, Director, NCAP
11. Dr. B.S. Parmar, Joint Director, IARI
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13. Dr. R.K. Mittal, Pri. Scientist (TC)
14. Dr. Rajiv Maheshwari, OSD
15. Dr. Sudhir Kochhar, Principal Scientist & Member Secretary

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3. Dr. Mruthyunjaya, National Director (NATP)
4. Dr. S.Prakash Tiwari, Director, NAARM
5. Dr. Ramesh Chand, Director, NCAP
6. Shri R.K.Gupta, Head, IPMD, CSIR
7. Dr. Lal Krishna, ADG (AH)
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9. Dr. Suresh Kumar, Principal Scientific Officer, TIFAC, DST
10. Dr. V.S.Rekhi, Former Director, NLUI; Law Expert
11. Ms. Neeti Wilson, Representative, Anand & Anand Advocates
12. Dr. R.P.Sharma, Representative NAAS
13. Dr. K.V.Prabhu, Representative NAAS
14. Mr. Harish Prasad, Director (Seed), DAC
15. Mr. D.S.Mishra, Asstt. Director (Seed), DAC
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18. Dr. S.K.Pareek, Principal Scientist, NBPGR
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New Delhi

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ADG (Marine Fisheries), ICAR
New Delhi

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1. Dr. Mangala Rai, Secretary, DARE and DG, ICAR In Chair (on all meeting days)
2. Dr. Rita Sharma, AS (DARE) & FA and Chairperson
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7. Dr. Nawab Ali, Deputy Director General (Engineering)
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14. Dr. S. Mauria, ADG (IPR & Policy)
15. Dr. Lal Krishna, ADG (AH)
16. Dr. C.P. Singh, ADG (Seeds)
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22. Dr. Suresh Pal, Principal Scientist & I/C Consultancy Cell, NCAP
23. Dr. S.K.Pareek, Principal Scientist, NBPGR
24. Dr. R.K.Mittal, Principal Scientist (TC), ICAR
25. Dr. N.H. Rao, Principal Scientist, NAARM
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30. Dr. Jyoti Mishri, Sr. Scientist (Policy)
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33. Dr. Sudhir Kochhar, Principal Scientist & Member Secretary

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