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COMMITTEE ON AGRICULTURE
(2014-2015)

SIXTEENTH LOK SABHA

MINISTRY OF AGRICULTURE (DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION)

DEMANDS FOR GRANTS (2014-2015)

SECOND REPORT

सत्यमेव जयते

LOK SABHA SECRETARIAT
NEW DELHI
December, 2014/*Agrahayana,* 1936 *(Saka)*

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Presented to Lok Sabha on 18.12.2014
Laid in Rajya Sabha on 18.12.2014

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(2014-2015)

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SECRETARIAT

1. Shri Abhijit Kumar — *Joint Secretary*
2. Smt. Abha Singh Yaduvanshi — *Director*
3. Shri Sumesh Kumar — *Under Secretary*

INTRODUCTION

I, the Chairperson, Committee on Agriculture, having been authorized by the Committee to submit the Report on their behalf, present this Second Report on the Demands for Grants (2014-2015) of the Ministry of Agriculture (Department of Agricultural Research and Education).

2. The Committee under Rule 331E (1)(a) of the Rules of Procedure considered the Demands for Grants (2014-15) of the Ministry of Agriculture (Department of Agricultural Research and Education) which were laid in Lok Sabha on 23 July, 2014. The Committee took evidence of the representatives of the Department of Agricultural Research and Education, at their sitting held on 26 September, 2014. The Report was considered and adopted by the Committee at their sitting held on 10 December, 2014.

3. For facility of reference, the observations/recommendations of the Committee have been printed bold at Part-II of the Report.

4. The Committee wish to express their thanks to the officials of the Ministry of Agriculture (Department of Agricultural Research and Education) for placing before them the requisite material and their considered views in connection with the examination of the subject.

5. The Committee would also like to place on record their deep sense of appreciation for the invaluable assistance rendered to them by the officials of Lok Sabha Secretariat attached to the Committee.

NEW DELHI;
16 *December,* 2014
25 *Agrahayana*, 1936 *(Saka)*

HUKM DEO NARAYAN YADAV,
Chairperson,
Committee on Agriculture.

ABBREVIATIONS

ADG	Additional Director General
ADI	Aggregated Drought Index
AICRP	All India Coordinated Research Project
AIL	Agroinnovate India Limited
ANGRAU	Acharya NG Ranga Agricultural University
ARYA	Attracting and Retaining Youth in Agriculture
ATFC	Agriculture and Technology Forecast Centre
BE	Budget Estimates
BPD	Business Planning and Development
CCAP	Climate Change Action Plan
CCEA	Cabinet Committee on Economic Affairs
CAU	Central Agricultural University
CFY	Current Financial Year
CIAE	Central Institute of Agricultural Engineering
CIPHET	Central Institute of Post Harvest Engineering and Technology
CRIDA	Central Research Institute for Dry Land Agriculture
CRP	Consortia Research Products
DAC	Department of Agriculture and Cooperation
DARE	Department of Agricultural Research and Education
DDG	Deputy Director General
DEA	Department of Economic Affairs
DRWA	Directorate of Research on Women in Agriculture
DSR	Directorate of Sorghum Research
DWSR	Directorate of Weed Science Research

EFC/SFC	Expenditure Finance Committee/Standing Finance Committee
EWS	Early Warning System
FLD	Front Line Demonstration
FMD	Foot and Mouth Disease
FPR	Flood Prone River
FY	Financial Year
GBS	Gross Budgetary Support
GDP	Gross Domestic Products
GEF	Global Environment Facility
GoI	Government of India
IARI	Indian Agricultural Research Institute
ICMR	Indian Council of Medical Research
INM	Integrated Nutrient Management
ICAR	Indian Council of Agricultural Research
INSIMP	Initiative for Nutritional Security Through Intensive Millet Promotion
IPRs	Intellectual Property Rights
IT	Information Technology
IVRI	Indian Veterinary Research Institute
IWMP	Integrated Watershed Management Programme
JS	Joint Secretary
K	Potassium
KVKs	Krishi Vigyan Kendras
LCPC	Lead Centre Platform Cordinator
MoEF	Ministry of Environment Forest
MoF	Ministry of Finance
MoRD	Ministry of Rural Development
MoU	Memorandum of Understanding
NAARM	National Academy of Agricultural Research Management

NAEP	National Assessment of Education Programme
NAIP	National Agricultural Innovation Project
NAPCC	National Action Plan for Climate Change
NARS	National Agriculture Research System
NASF	National Agricultural Science Fund
NCAP	National Centre for Agricultural Economics and Policy Research
NGOs	Non-Governmental Organizations
NICRA	National Initiative on Climate Resilient Agriculture
NFBSFARA	National Fund for Basic Strategic and Frontier Application Research in Agriculture
NPCC	National Project on Climate Change
NRM	Natural Resource Management
NSC	National Seed Corporation
NWDPRA	National Watershed Development Project for Rainfed Areas
P	Phosphorus
PAU	Punjab Agriculture University
PIC	Project Incharge Centre
PIU	Project Implementation Unit
PME	Project Monitoring and Evaluation
PPI	Project Principal Investigator
PPP	Public Private Partnership
PSUs	Public Sector Undertakings
QRTs	Quinquennial Review Teams
RAC	Research Advisory Committee
RAWE	Rural Agricultural Work Experience
R&D	Research and Development
RE	Revised Estimates
READY	Rural Entrepreneurship Awareness Development Yojana

SAUs	State Agricultural Universities
SHM	Soil Health Management
SOC	Senior Officers, Committee
SMD	Subject Matter Division
SMSs	Short Messaging Services
STFR	Soil Test Fertiliser Recommendations
UASs	University of Agriculture Sciences
WHO	World Health Oragnisation

CHAPTER I

IMPLEMENTATION OF THE COMMITTEE'S RECOMMENDATIONS

The Forty-seventh Report of the Committee on Agriculture on Demands for Grants (2013-14) of the Ministry of Agriculture (Department of Agricultural Research and Education) was presented to Lok Sabha on 23 April, 2013 and laid on the Table of Rajya Sabha the same day. The Report contained 27 Observations/Recommendations.

1.2 The Minister concerned is required to make Statement under Direction 73-A of Directions by the Speaker, Lok Sabha about the status of implementation of Recommendations contained in the Original Report of the Committee within six months of presentation of Report to the Parliament. Statement under Direction 73-A in the context of the Forty-seventh Report was made by the Minister of Agriculture on 27 August, 2013 which is within time.

1.3 On the basis of the Action Taken Notes received on 18 July, 2013 from the Department of Agricultural Research and Education in respect of the Forty-seventh Report, the Committee presented their Fifty-first Report to Lok Sabha and laid on the Table of Rajya Sabha on 09 December, 2013. The Committee commented on the Action Taken Notes furnished by the Department in respect of Recommendations at Para Nos. 2.19, 2.20, 3.31, 3.33, 3.35, 3.36, 4.58, 4.59, 4.60, 4.61, 4.65 and 4.71 of the Fifty-first Report. An analysis of the Action Taken Notes revealed that the Government have accepted 92% Recommendations of the Committee. 4% Recommendations have not been accepted by the Government thus requiring reiteration. Replies in case of 4% Recommendations are of interim nature.

1.4 The Committee note that the Action Taken Replies regarding the action taken by the Government on the Observations/ Recommendations contained in the Forty-seventh Report of the Committee were furnished by the Government within the stipulated three months and the Statement of the Minister under Direction 73-A was made within the stipulated six months period. An analysis of the action taken by the Government reveals that 92% Recommendations

have been accepted, 4% Recommendations have not been accepted and 4% of Recommendations are in the various stages of implementation. The Committee hope and trust that the Department will continue to adhere to the stipulations laid down under Direction 73-A in future, in letter and spirit.

CHAPTER II

INTRODUCTORY

Agriculture in India accounts for over 19% of the GDP and 12% of the country's exports providing employment to over 50% of the work force. It has always been endeavour of every society of world to devise better varieties, processes and ways to improve production, productivity and quality of agricultural produce so that growth in agriculture keep pace with the population growth for not only sustainable food security but also for ensuring revenue from exports of surplus. Therefore, it becomes imperative to engage substantial resources, financial as well as human, for research and development for agriculture. It is essential that through research in agriculture new frontiers of science and knowledge for farmer's progress and productivity are explored. Through technologies, interventions and trained human resources, they can have a vibrant, responsive and resilient agriculture.

2.2 Department of Agricultural Research and Education (DARE) under the Ministry of Agriculture is the nodal department at Central level to coordinate activities for research and development in agriculture. Indian Council of Agricultural Research (ICAR) is the agency which is responsible for spearheading the work for research and development DARE provides Government linkages to Indian Council of Agricultural Research (ICAR) under the administrative control of DARE. ICAR is an apex and scientific organization at national level with a strong agricultural research system, has a wide network of Institutes spread throughout the country and well-established institutional linkages with the State Agricultural Universities and other departments of the Central and State Governments.

2.3 The ICAR is committed to promote sustainable and inclusive agricultural growth and development in the country by interfacing education, research and frontline extension initiatives complemented with efficient and effective institutional, infrastructure and policy support, for ensuring livelihood and environmental security. The ICAR is oriented to attain their objectives with the network of 67 Institutes including 5 Deemed Universities, 15 National Research Centres, 14 Directorates, 6 National

Bureaux, 60 State Agricultural Universities and 641 Krishi Vigyan Kendras. 67 Institutes of ICAR are doing research and development in eight Subject Matter namely Crop Science, Natural Resources Management, Horticulture Sciences, Animal Science, Fisheries Sciences, Agricultural Engineering, Agricultural Education and Agricultural Extension. These institutes are entrusted with the overall responsibility for the preparation, scrutiny, review and technical supervision and guidance of the research schemes, educational programmes and projects within their respective disciplines.

(1) Overview of Demand

2.4 Demand No. 2 pertaining to the Department of Agricultural Research and Education for the year 2014-15 was presented to the Lok Sabha on 23 July, 2014. Allocations proposed for 2014-15 and actual expenditure during the year 2012-13 and 2013-14 are as follows:—

(Rs. in crore)

DEPARTMENT	2012-13			2013-14			2014-15
	BE	RE	AE	BE	RE	AE	BE
PLAN							
DARE	156.00	206.50	85.59	180.00	120.02	119.99	190.00
ICAR	3064.00	2313.50	2289.14	3235.00	2479.98	2349.18	3525.00
TOTAL	3220.00	2520.00	2374.73	3415.00	2600.00	2469.17	3715.00
NON-PLAN							
DARE	19.65	8.60	8.15	9.73	10.38	9.72	11.24
ICAR	2152.35	2091.40	2086.42	2304.44	2270.70	2240.29	2418.15
TOTAL	2172.00	2100.00	2094.57	2314.17	2281.08	2250.01	2429.39

2.5 It may be seen from the above that plan allocation to DARE/ ICAR were reduced by Rs. 815.00 crore (23.86%) at RE stage. When asked to state reasons behind the steep cut at RE stage under Plan head during 2013-14, the Department have stated that reduction in Plan funds at RE stage may be attributed to the cut imposed by the Ministry of Finance, Government of India on the overall budget of various Ministries/ Departments of the Government keeping in mind the availability of overall resources.

2.6 On being asked about effect of cut in fund allocations during 2013-14 in Plan schemes at RE stage, the Department have stated it has

affected the pace of progress of some important research programmes such as genomics works in horticultural plants, markers for desirable traits, and stem cell research. Besides, some other activities like preparedness to address impact of impending climate change, strengthening of existing KVKs with additional facilities like diagnostic facilities, soil and water testing labs, farm mechanization, etc. were affected. Certain new initiatives also could not be started due to curtailment of funds at RE stage. However, efforts have been made to ensure that the regular research programmes and other activities related directly to benefit farmers are not affected.

2.7 On the above issues the representative of DARE have stated as under:—

> ".....our budget was about Rs. 5703 crore for the Tenth Five Year Plan. In the Eleventh Plan Rs. 12000 were approved and actually we received approx. '10,240 crores. You that we have to discover many things and we are doing all these things. I would also like to tell about the approval we actually got. The N.D.C meeting held in December, 2012 and after that the Department of Agricultural Research and Education have received Rs. 25,553 crores. This approval is for Twelfth Plan. I would also like to mention what we received in two years. In between this will be approx. 8000 crores in three years. Some reduction was made at RE stage in the first two years. Approx. 30% reduction made in the allocations across the Department and we have submitted that. This is all going on and these are the challenges before us.
>
> Secondly, Budget was mentioned, I would like to submit that we submitted our demand on time at the starting of the year. For example Rs. 4719 crores were sought during the year 2012-13 while we were allocated Rs. 3220 crores. Later on, finally we received Rs. 2520 crores. In the year 2013-14, we submitted a demand of Rs. 4869.37 crores and in the BE we were allocate Rs. 3415 crores but in the RE it was reduced to Rs. 2600 crores. I am trying to say that the reduction in the two years has certainly affected on some research subjects. In the year 2014-15 we demanded Rs. 6209.39 crores and we have been allocated Rs. 3715 crores.
>
> As you have stated earlier, we are getting 0.56% to 0.7% of the agriculture GDP of financial budget. The countries which have made achievements in the field of agriculture research, education

and growth in the world invest at least 2% in agriculture research and education. We also want this but atleast 1 to 1.5% must be invested."

2.8 The representative of DARE has also informed the Committee that return on investment made on research and development in agriculture is quite high. On the issue, the representative of DARE has stated as under:—

"….All over the world people have conducted studies to arrive at certain conclusions. These studies were not done by us. It was a study conducted by persons from some other country wherein they concluded that we invest 1 rupee in agriculture research and education in India, we at least get Rs. 13-13.5 as return. In comparison with some other sectors this is the most efficient investment. This thing has come into light…."

2.9 It has often been found that provisions are made during Budget announcement for the Department of Agricultural Research and Education. On being enquired about provisions/grant of separate funds for schemes announced during Budget presentation apart from GBS to the Department, the Department have stated that no separate grant, other than the GBS, was allocated to the Department during 2012-13 or 2013-14 to meet any Budget announcement in the respective years.

2.10 On being asked about the observation of the Committee that IARI type deemed university in Assam and Jharkhand were announced in the Budget Speech of the Finance Minister in 2014-15, but grants have not been provided by the Planning Commission. The Department have stated that matter for setting up IARI type Deemed University in Assam and Jharkhand is being taken up with Ministry of Finance for making provisions for the same in the GBS of DARE/ICAR in the Supplementary Demand for Grants. Similarly, Rs. 100 crore was announced for Agri-Tech and infrastructure funds to DARE. However, this amount has been provided to DAC and not to DARE. On this issue, the Committee have been apprised that as far as Agri-Tech Infrastructure Fund is concerned, Department of Agriculture and Cooperation has clarified that the proposal towards setting up of Onion Tech. Development Centre has already been moved by Horticulture Division and the proposed EFC seeks funds from the Agri-Tech. Infrastructure Fund.

(2) Outlays for 2014-15

2.11 Scheme-wise allocation to different divisions of DARE/ICAR under Plan and Non-Plan head are as follows:—

(A) Plan BE for 2014-15

(Rs. in Lakhs)

Sl. No.	Major Head	Budget Estimates (2013-14)	Budget Estimates (2014-15)
	PLAN		
1.	Crop Science	46500.00	47000.00
2.	Horticulture	20000.00	21000.00
3.	ICAR Head qtr.	39500.00	40000.00
4.	Agricultural Extension	52000.00	60000.00
5.	Agricultural Education	47500.00	55000.00
6.	E.S.M.	1000.00	3000.00
7.	Agricultural Engineering	7500.00	8500.00
8.	Natural Resource Management including National Initiative on Climate Resilient in Agriculture	22000.00	32500.00
9.	Animal Science	22500.00	23000.00
10.	Fisheries	8500.00	9500.00
11.	NAIP	40000.00	10900.00
12.	National Fund for Basic, Frontier and Strategic Application Research in Agriculture	7500.00	12100.00
13.	National Initiative on Climate Resilient in Agriculture	9000.00	—
	TOTAL ICAR	323500.00	322500.00
	CAU Imphal+Barapani	10000.00	17000.00
	New Initiatives–DARE		
	CAU Bundelkhand	5000.00	1000.00
	CAU Bihar	3000.00	1000.00
	National Adoptation Fund	—	10000.00
	Agriculture University, Andhra Pradesh	—	10000.00
	Horticulture University, Telangana		10000.00
	TOTAL DARE/ICAR	341500.00	371500.00

(B) Non-Plan BE for 2014-15

(Rs. In lakhs)

Sl. No.	Major Head	Budget Estimates (2013-14)	Budget Estimates (2014-15)
	NON-PLAN		
1.	Crop Science	69479.00	73704.00
2.	Horticulture	26991.00	29096.00
3.	ICAR Headquarters	12131.00	13030.00
4.	A.P. Cess	25.00	50.00
5.	Agricultural Extension	405.00	375.00
6.	Agricultural Education	5539.00	5412.00
7.	E.S.M.	3802.00	3728.00
8.	Agricultural Engineering	9224.00	9601.00
9.	Natural Resource Management	32454.00	34764.00
10.	Animal Science	46560.00	47773.00
11.	Fisheries	23834.00	24282.00
	Total ICAR	230444.00	241815.00
	DARE—Secretariat	490.00	581.00
	DARE—Contributions	483.00	543.00
	TOTAL DARE/ICAR	231417.00	242939.00

(3) Budgetary Planning

2.12 A well thought out financial planning is pre-requisite for effective utilization of available resources. About basis and procedure through which the Department of Agricultural Research and Education (DARE) work out the financial requirements for various activities/schemes, both for the Five Year Plan and the Annual Plan before and after finalization of the allocation, the Department stated that for finalizing the financial requirements for annual plan and the five year plan, the allocated funds are first distributed among all the sectors/Subject Matter Divisions and thereafter for every scheme/project, the targeted activities and the related infrastructure and facilities are taken into account and the proposals moved by various schemes are vetted at different levels before its finalization. Thrust and priority research areas are the main basis through which financial requirements are worked out prior to submitting the five year and annual plan proposals for approval.

2.13 When asked to spell about steps taken to ensure so that the proposed allocations by the DARE are duly prioritized, rational and realistic so as to not invite drastic cuts at various subsequent stages of consideration, the Department stated that the proposals received from the institutes/schemes are critically examined at divisional level keeping in view the mandate and requirements of the institutes for fulfilling within the budgetary allocations. Each institute may have more than one priority research areas during a particular year which may require additional infrastructure and equipments for which separate fund allocations are required. After the fund allocations, most important and priority research programmes are taken up and others are postponed without any drastic cuts in the programmes. The exercise is also done in the EFC/SFC meetings held at the Council level.

2.14 Regarding in-house mechanism for planning agricultural research within the DARE, the Department have stated that Research proposals are planned by scientists in accordance with the mandate of the institute in consultation with the Head of the Division. The proposals are submitted to the Prioritization, Monitoring and Evaluation (PME) cell, which evaluates the proposals in the light of institute mandate, facilities available and priority of the work. The proposal is then presented in the Institute Research Council (IRC) meeting, where the proposal is approved.

2.15 The approved projects are monitored by Institute Research Council Meetings on six monthly basis and Research Advisory Committee Meetings (RAC) on an annual basis. The Quinquennial Review Teams (QRTs) constituted by ICAR comprising experts in the field do evaluate critically the ongoing programmes and offer suggestions for mid-course corrections for achieving the stated objectives. Periodical review is being carried by the PME cell also. Inputs/suggestions from the respective subject matter divisions are also taken. Monitoring is periodically carried out by the ICAR.

2.16 Recently, Government of India decided to abolish Planning Commission in formulation and allocation of resources and replace it with a new body. When asked to furnish views of the DARE on the issue of dissolution of Planning Body and contours of the new body responsible for planning, the Department stated that an institution like Planning Commission is essential to create a dialogue and set-up agenda for R&D and facilitate the Departments in setting-up their priorities as per the Government policy and approach and needs of the masses. All such ingredients may be inculcated in the new body with more autonomy and the Departments to play more participatory role in such a body.

(4) Twelfth Plan Allocation

2.17 The funds sought by the Department for entire 12th Plan was Rs. 57887.21 crore. The Planning Commission has made an allocation of Rs. 25553.00 crore for 12th Plan. It has been observed that outlay of only 40.5% allocations (BE) have been made during first three fiscal as against earmarked outlays for 12th plan. When asked to submit Proportion of Allocation of Plan Budget to DARE/ICAR during 12th Plan, the Department has submitted following details:

Proportion of Allocation of Plan Budget to DARE/ICAR during 12th Plan

(Rs. in crore)

	Total Outlays	2012-13	2013-14	2014-15
Total Outlays of Centre	3603360.00	651509.25	614134.00	464934.00
Total Plan outlays for DARE/ICAR	25553.00	3220.00	3415.00	3715.00
% DARE outlays w.r. to Total	0.70	0.49	0.55	0.79

2.18 The Department informed that the Budgetary share of DARE over plan periods in comparison to other Departments of Ministry of Agriculture, is as following:—

(Rs. in crore)

	11th Five Year Plan	12th Five Year Plan
Total Central Plan Outlay of the country	2156571.00	3603360.00
Total Plan Outlay of DARE (% share of DARE w.r. to total Plan Outlay of the Country)	12023.00 (0.56%)	25553.00 (0.70%)
Total Plan Outlay of DAC (% share of DAC w.r. to total Plan Outlay of the Country)	41337.00 (1.92%)	71500.00 (1.98%)
Total Plan Outlay of DAHD&F (% share of DAHD&F w.r. to total Plan Outlay of the Country)	8054.00 (0.37%)	14179.00 (0.70%)

2.19 On the scrutiny of Document submitted by the DARE, It has also been observed that proposed fund by the DARE were reduced considerably at BE as well as RE stage during each of first three fiscal

years. Details of proposed funds and allocations during first three years of 12th Plan are as follows:—

(Rs. in crore)

12th Plan earmarked outlay	2012-13				2013-14				2014-15	
	Pro-posed	BE	RE	AE	Pro-posed	BE	RE	AE	Pro-posed	BE
25553.00	4719.68	3220.00	2520.00	2374.73	4869.37	3415.00	2600.00	2469.17	6209.39	3715.00

2.20 When asked about reasons given by the Planning Commission/ Ministry of Finance for low allocations at BE and RE stage to DARE respectively, the Department have stated that no specific reasons have been mentioned by the Planning Commission/Ministry of Finance for low allocations at BE/RE stage to DARE. However, there has been some cut by the centre to the tune of around 30% during the first two years of the 12th Plan. Moreover, the Planning Commission has also to keep in mind the total size of the resources available with them. The allocations to DARE have to be rationalized keeping in view total available resources in the country and the demands of various other Ministries. There have been demands from other sectors like infrastructure for education, health, sanitation etc. At RE stage, the reason for low allocations by Ministry of Finance may be both due to limited availability of funds at the disposal of Ministry of Finance as well as lower utilization by the Department due to non-clearance of Plan Schemes by the respective Plan SFC/EFCs.

2.21 When the Committee enquired about effect of reduced allocations on implementation of various schemes and Research and development work in ICAR institutions, the Department have stated that reduced allocations have resulted in postponing some of the work items in some of the institutes. The priorities were given to the ongoing Research activities and sufficient funds were allocated from the funds available with the Council. Some other activities affected to some extent are preparedness to address the impact of impending climatic change, strengthening existing KVKs with additional facilities like basic plant health, diagnostic facilities, soil and water testing labs, farm mechanization and primary processing etc. The planning process for new initiatives namely CRPs on Agrio-biodiversity management, Genomics and molecular breeding, water, health foods etc. has slackened due to the reduced allocations during the 12th Plan. Apart from this, the pace of progress of certain other new initiatives such as National Agriculture Education Project (NAEP), Farmer FIRST, Student READY and ARYA etc. is also affected.

2.22 When asked to spell out plan of DARE to meet the physical targets fixed for the Plan keeping in view the reduced allocation, it was stated that DARE plans to prioritize projects and programmes. It also plans to have linkages, sharing of facilities, infrastructure etc. to the extent possible. The concept of the Consortia Research Platforms is an initiative which has been envisaged keeping in mind that people come together and there is no duplication. These Consortia Research Platforms are formed for conducting short-term focused research in currently relevant problems.

2.23 On the issue of possibility of enhanced allocation to the DARE so as to meet the earmarked outlays for 12th Plan in next two fiscal years, the Department have stated that they have been continuously raising its demand for higher allocation to Planning Commission/Ministry of Finance. The EFC/SFC proposals of all the schemes have been finalized and provisions for taking up all the activities as envisaged in various schemes have already been made. The Department will try its best to get higher allocation from the Ministry of Finance at RE stage of 2014-15 and in the next two fiscal years of the 12th Plan.

(5) New Initiative in 12th Plan

2.24 The Department in their document submitted for the Scrutiny of DFG (2014-15) have stated that following initiative are being taken during 12th Plan:—

- Central Agricultural Universities: Three new CAUs are being established during this Plan for strengthening region specific agricultural research and education:
  - — CAU Bundelkhand
  - — CAU Bihar
  - — CAU Barapani
- National Research Centre on Integrated Fish Farming, Katihar National Adaptation Fund.
- Agricultural University at Andhra Pradesh Horticulture University at Telangana.
- National Agriculture Education Project—Advancement of agricultural education for technology generation, human resource development and extension.

- Indian Agricultural e-Extension Research Institute (IAeRI)—a sub-scheme of Directorate of Knowledge Management in Agriculture.

- Student Rural Entrepreneurship Awareness Development Yojana (READY)—hands on experience for students in marketing and other skills in agriculture so as to become entrepreneurs.

- Attracting and Retaining Youth in Agriculture (ARYA)—conceptualised for mentoring/handholding rural youth in villages by providing technical and financial support to upscale/commercialise promising technologies and grassroot innovations.

- Agriculture and Technology Forecast Centre (ATFC)—to identify and develop technological needs for precision and forecasting in various domains of agriculture.

- Farmers FIRST—an initiative to move beyond the production and productivity and to privilege the complex, diverse and risk prone realities of majority of the farmers through enhancing farmers-scientists contact with multi stake holders-participation.

- Centre for Agricultural Bio-informatics (CAB in)—integrates a number of organizations to provide computational framework and support to carry out bio-technological research.

- Extra Mural Funds—to fund short-term result oriented time-bound projects to address critical gaps of research.

- Consortia Research Platforms—Formed for conducting short-term focused research in currently relevant problems. The following are the identified areas:

    — Agro-biodiversity Management

    — Hybrids

    — Molecular Breeding

    — Bio-fortification

    — Borers (Network mode)

    — Nanotechnology

— Phytochemicals and High Value Compounds (Network mode)

— Conservation Agriculture

— Water

— Farm Mechanisation

— Energy

— Health Foods

— Secondary Agriculture

— Natural Fibre

— Diagnostics and vaccines

— Genomics

2.25 When asked about status of establishment Central Agricultural Universities in Bihar, Bundelkhand and Barapani, the Department have furnished following details:—

CAU Bihar: Regarding establishment of Central Agricultural University in Bihar, a draft Memorandum of Understanding has been submitted by the Government of Bihar for the conversion of Rajendra Agricultural University, Pusa into Central Agricultural University to firm up modalities for transfer of liabilities. The process of finalization of MoU is in progress.

CAU Bundelkhand: The Rani Lakshmi Bai Central Agricultural University in Bundelkhand was established in Jhansi on 5 March, 2014.

CAU Barapani: The EFC of CAU, Barapani is being revised in the light of the comments received from Internal Finance and suggested reorganization of territorial jurisdiction. After the establishment of CAU, Barapani, colleges of Tura, Barapani, Meghalaya and Nagaland will be in this university.

2.26 When asked about status of establishment Agricultural University at Andhra Pradesh and Rajasthan as well as establishment of Horticulture University at Telangana and Haryana, the Department have stated that ICAR has requested the Chief Secretaries of respective

States to forward a plan of action for establishment of Agricultural Universities in Andhra Pradesh and Rajasthan and Horticulture Universities in Telangana and Haryana in the current financial year.

2.27 When asked to furnish details of financial allocation made during 2014-15 for establishment of these universities, the Department has furnished following information:—

(Rs. in crore)

Name of Schemes	Allocations						
	2012-13			2013-14			2014-15
	BE	RE	AE	BE	RE	AE	BE
CAU, Bundelkhand	20.00	0.99	—	50.00	0.01	—	10.00
CAU, Bihar	10.00	0.01	—	30.00	0.01	—	10.00
Agricultural University, Andhra Pradesh	—	—	—	—	—	—	100.00
Horticulture University, Telangana	—	—	—	—	—	—	100.00
CAU Imphal + Barapani	126.00	85.50	85.59	100.00	120.00	119.99	170.00

2.28 On the above issue, the representative of DARE submitted before the Committee:—

> "……Hon'ble Chairperson, there has been a point regarding higher education time and again. As you know the number of State agricultural universities, Central universities and deemed universities has reached 70 these days. There are four Indian Agriculture Research Council. Four more universities have been announced recently in the budget. One in Haryana and other one in Rajasthan. One more has been made in Andhra Pradesh and Telangana too. An announcement regarding setting up of Institutes like Indian Agriculture Research Institute which is in Delhi has been made in Assam and Jharkhand and we are engaged in its implementation. An effort is being made to set up a Central Agriculture University at Rajendra Nagar of Pusa in Bihar. We asked for some documents from there and as soon as the documents are received from them, we will move ahead in this regard."

2.29 On the query regarding progress made for launching the scheme for Attracting and Retaining Youth in Agriculture (ARYA), the Department stated that the EFC of this scheme as a sub-scheme of Intellectual Property and Technology Management scheme is under

submission to Ministry of Finance for final approval. On the issue, the representative of DARE submitted before the Committee:—

> ".....today the matter of concern is that there are many uncertainities in agriculture. If there is any uncertain sector, then certainly it is agriculture. That is why we are making efforts to make agriculture static. There should be a basic economic sector in this country as it would be earlier. We want that you should be guiding in this regard. There is a perception here that young generation is going to abolish it. This is right to some extent. Now-a-days we are getting a lot of examples. Wherever we visit we find and we have also felt, as we keep on visiting the villages, many people are adopting the agriculture once again. Some people migrated to the cities. They got a job there of Rs. 150-200. But, those who own the land, began to feel that something should be done on return. I can present thousands of such examples before you. Whenever I visit any University of any State, profiles of many successful farmers are brought before me. Only yesterday, I was in Hyderabad in an International Institute, there has been a publication from that Institution as to how many women have adopted agriculture of their own accord and the extent by which they have been successful. I would like to bring this point to your notice".

2.30 Explaining about their initiative on Rural Entrepreneurship Awareness Development Yojana (READY) scheme, the Department stated that this program was proposed in the XII plan under Scheme "Strengthening and Development of Higher Agricultural Education". The scheme aims at developing entrepreneurship among youth through skill development of students in project mode and will be implemented in different agricultural universities. It would act as a Finishing school for the undergraduate students. It combines the existing RAWE with the newly introduced Experiential Learning module to have a dynamic 40 credit module in the final year of the UG course study. When asked about possibility of launching the scheme, the Department stated that the scheme will be initiated after getting CCEA approval.

2.31 When asked about objective of National Adaptation Fund, the Department has stated that the objectives of National Adaptation Fund, as envisaged by ICAR are as under:—

(1) To enhance the adaptive capacity and preparedness of farming to climate risks in vulnerable areas through natural resource conservation and management

(2) To plan and initiate appropriate interventions towards resilient production systems (crop, livestock and fisheries) to face contingency situations due to climate variability.

(3) To build resilience through creation of common facilities for custom hiring of farm machinery, production of seed, planting material, feed/fodder and organic inputs in village clusters.

(4) To establish pilot scale incubators for innovative climate resilient technologies in the pipeline at research institutes to provide technical backstopping and testing in village clusters and handholding prior to technology transfer.

(5) To quantify adaptation gains and co-benefits of technology interventions to address climate change.

(6) To promote awareness, dissemination and capacity building of farmers and all other stakeholders on adaptation.

2.32 When asked about progress made under the scheme to achieve the objectives, the Department have stated that the Planning Commission had provided Rs. 100 crore for establishment of this Fund for Climate Change in the Gross Budgetary Support for DARE 2014-15. But the Finance Ministry in their notification had mentioned this Budget Para to the Deptt. of Agriculture and Co-operation and Ministry of Environment and Forests (MoEF).

2.33 The Department has further stated that the MoEF has intimated to Ministry of Finance that the "detailed guidelines on this aspect are being formulated towards including new activities, *inter alia,* relatable to agriculture under the National Action Plan for Climate Change (NAPCC)/ Climate Change Action Plan (CCAP) and in this regard consultations are being scheduled with various State Governments shortly. They have also mentioned in their letter to Ministry of Finance that prior to taking up the matter for approval of SFC/EFC/competent authority to operationalize the fund, it is aimed at finalizing the detailed guidelines as above by 31st October 2014". Meanwhile, Ministry of Finance has again sent a clarification on 29th September, 2014 that this budget para belongs to both the Ministries *i.e;* MoEF and DARE. The matter is being sorted out.

2.34 When asked about modalities of Consortia Research Platforms, the Department in their written replies have stated that the Agri-Consortia Research Platforms (Agri-CRPs) and the projects therein are Plan funded

scheme of ICAR and 100% expenses of these projects are met by the ICAR. The Agri-CRPs are covered under the one time umbrella Memorandum of Understanding (MoU), signed between the ICAR and the Institution concerned. The terms of bilateral or multilateral research collaboration will be explicitly brought out in the Umbrella MoU between/ amongst the research/academic institutions. The MoU will have a clause that in the event of non-implementation/non-completion of a Research Project, the grantee institution shall refund the whole amount received by it along with penal interest.

2.35 The Department have also stated that assistance shall be for expenditure towards Grants-in-Aid-General (recurring contingencies including for manpower, research materials etc.), travelling allowance and Grants-in-Aid for Creation of Capital Assets (non-recurring contingencies including essential instruments/equipments, and for small items of works for research purpose).

2.36 The Department has further informed that Budget section of ICAR Hqrs. will release the funds to the institute under the sub-scheme ('Name of the Platform'), as is being done for other similar Plan Projects, on the basis of approved MEP by Ministry of Finance. Being Plan funds, releases will be made on quarterly basis after taking into account unspent balances out of the previous releases, if any. The unspent funds at the end of the year will have to be refunded to the Council. There will be no revalidation of funds of any kind of expenditure. After a new Agri-CRP has been approved by Finance division/SMD, its sanction will be conveyed by the SMD to the host institution of Lead Centre Platform Co-ordinator (LCPC), who in turn, shall communicate with the various Project Principal Investigator (PPI). The first release of grants will be made by the Budget Section on the basis of intimation of BE/RE received under Annual Plan. The grantee institution will submit the Audited Utilization Certificate of the preceding year before the release of grants beyond 75%. In the final year of the project (s) under each Agri-CRP, the first installment for six months will include the funds required as research contingency for the entire year. The grant towards research contingency for the final six months will be released, once verification is done with regard to final submission of the report. All Agri-CRPs shall be implemented within 6 months of conveying of the sanction, failing which the sanctions accorded shall stand withdrawn. Extension, in this period shall be given only in exceptional cases, up to one year, with the specific approval of the relevant PIC. Procurement of equipment and infrastructure development are to be completed within one year from the date of start

of the scheme. Re-appropriation of funds between "Grants-in-Aid-General" to "Grants-in-Aid for Creation of Capital Assets" is not permissible. At the completion of the scheme, the Principal Project Investigator (PPI) shall submit the final report in the prescribed format, which shall be examined by Subject Matter Division (SMD), for identifying specific research results achieved, their significance, and follow-up required for further investigations, if any. The final report is to be approved by the concerned PICs and put up with comments for PIC approval.

2.37 When asked about role envisaged for private sector research organization in the Consortia Research Platforms, the Department have stated that Private Research bodies/Organizations can also partake in the Agri-CRPs, which are integral part of the on-going research in the lead institute and co-operating units.

(6) Fund Surrendered

2.38 When asked to submit scheme-wise details of funds surrendered by the DARE during 2012-13 and 2013-14, the Department have submitted following information:—

(Rs. in crore)

Head	Plan	Non-Plan	Total
2012-13 – Revenue/Voted	0.99	0.25	1.24
2013-14 – Revenue/Voted	815.05	33.41	848.46

2.39 When asked to spell reasons for surrender of funds, the Department have stated that funds were surrendered due to reduction in RE 2012-13 *vis-à-vis* BE 2012-13 and RE 2013-14 *vis-à-vis* BE 2013-14 allocations and also as the bills connected to creation of Rani Lakshmi Bai Central Agricultural University, Bundelkhand was not approved by the Parliament.

2.40 When asked about system in place to monitor and ensure complete utilization of budgetary allocation, the Department have stated that after the budgetary allocations have been made by the Subject Matter Division (SMD) to various schemes/institutes, the institutes are instructed and advised to prioritize their programmes in the beginning of the year and initiate the processing of the proposals wherever approvals from the council are required. By-monthly monitoring of the expenditure of the institutes, instructions are issued to expedite the implementation of various

programmes. In order to ensure complete utilization of budgetary allocations, it is monitored at the level of subject matter divisions, by meticulously planning and facilitating the various approvals from the council and monthly monitoring of plan expenditures of the institutes.

2.41 When asked about measures being taken to utilize the available allocations in the year 2014-15, the Department in their written replies stated that expenditure under plan and non-plan is reviewed at every month in the Senior Officers Committee (SOC) meeting chaired by DG-ICAR and necessary instructions/guidelines are issued to all the schemes to utilize the allocated funds during the financial year 2014-15.

(7) Re-appropriation of Funds

2.42 When asked to submit scheme-wise/programme-wise details of re-appropriation of funds made by the DARE between the schemes/ programmes during 2012-13 and 2013-14, the DARE has submitted following details:—

(Rs. in lakhs)

Year	Reappropriation of Funds	
	Plan	Non Plan
2012-13	17070.93	3654.07
2013-14	14263.10	1161.75

2.43 On being asked about the reasons for re-appropriation of funds, the DARE has stated that re-appropriations were carried out with the approval of Secretary (Expenditure), Ministry of Finance on the basis of the Supplementary demands approved by the Parliament during 2012-13 and 2013-14 respectively. The savings under the Section Revenue/ Voted were utilized to meet the enhanced requirements under the same section of the Grant.

(8) Revenue Receipt

2.44 It has been stated in Document submitted for the scrutiny of DFG (2014-15) that DARE/ICAR has been given mandate to provide, undertake and promote consultancy services in the fields of research, training and dissemination of information in agriculture, agro-forestry, animal science, fisheries, home science and allied sciences.

When asked to submit year-wise details of fee received by all institutions of ICAR for consultancy/training services provided to other

organizations for period of 2009-2014, the Department stated that net income generated from consultancies undertaken during the last five years (2009-10 to 2013-14) is given below, based on the Audited Annual Statement of Accounts of ICAR:

(Rs. in lakhs)

Sl. No.	Head of A/C	2013-14	2012-13	2011-12	2010-11	2009-10
1.	Training Programme	193.81	286.36	259.33	318.84	216.08
2.	Consultancy services	67.38	85.06	89.65	64.05	59.00
3.	Contract research	86.80	90.24	26.76	110.78	62.74
4.	Contract Services	117.50	99.53	31.60	30.63	12.11
	Total	465.49	561.19	407.34	524.30	349.93

2.45 Regarding the financial provisions issued by Ministry of Finance for deposit and utilization of consultancy fee received by the Government Institutes, the Department stated that financial provisions for deposit and utilization of consultancy fee do exist and it has been approved by the Ministry of Finance. There are more than 100 ICAR Institutes across India and Consultancy Fee received by the Institutes are received at their end and deposited in the Bank accounts of the respective Institutes. When asked to submit a copy of relevant rules and approval of Ministry of Finance for utilization of consultancy fees received by ICAR institutes, the Department has furnished OM of ICAR dated 26th June, 2003 wherein, it has been stated that with the approval of the Governing Body and the President of the ICAR Society, the ICAR had adopted for implementation of the rules and guidelines relating to training, consultancy, contract research and contract service in ICAR based on the Joshi Committee Report, 1997. The Ministry of Finance has concurred in the adoption of these guidelines.

2.46 In their 'Annual Report (2013-14)', the Department has stated that first Agri-Tech Investors meet (18-19 July 2013) conducted by the NAIP on the recommendations of the ISM 12 came out successfully in catalyzing and managing change in the Indian NARS with a formal transfer of 58 technologies, including 30 technologies developed under the NAIP, to private entrepreneurs generating license fees of Rs. 3.2 crore, besides deals worth another Rs. 1.50 crore in the pipeline. When asked to submit details of license fee received by DARE/ICAR institutes during the last five years, the Department has stated that NAIP supported BPD Units (including BPDs of SAUs) have generated a sum of Rs. 964.48 lakhs, as license fee during 2011-12 to 2013-14.

2.47 On being enquired about the classification of license fees generated under NAIP classified as Revenue Receipt and its entry in Receipt Budget of Central Government, the Department stated that license fees generated under NAIP is classified as Revenue Receipt and the amount is remitted to Council by the respective Institutes, as per ICAR guidelines.

2.48 When asked to furnish details regarding targets and achievements of revenue generation of institutes of ICAR during 2012-13 and 2013-14, the Department has submitted following details:—

(Rs. in lakhs)

Sl. No.	Division	2012-13	2013-14	2013-14
		Achieve-ments	Targets	Achieve-ments
1.	Crop Science	1047.74	1100.10	1068.90
2.	Horticulture	780.23	819.20	662.92
3.	Natural Resource Management	668.71	702.20	757.47
4.	Agricultural Engineering	250.29	262.80	239.31
5.	Animal Science	1720.92	1806.90	1755.09
6.	Fisheries	300.59	315.50	202.58
7.	Agricultural Economics and Statistics	15.95	16.80	11.64
8.	Agricultural Education	79.61	83.50	68.11
9.	Agricultural Extension	28.26	29.60	28.12
10.	Headquarter	177.00	185.80	512.26
	Total	5069.33	5322.80	5306.38

2.49 On the scrutiny of Receipt Budget (2014-15), it has emerged that receipt of Rs. 0.01 Crore as revenue receipt during 2013-14 (RE) has been reflected in accounts. When asked to furnish sources of revenue for DARE/ICAR, the Department stated that main sources of Revenue Generation for ICAR are as under:—

(a) Income from Sales of farm produce/livestock

(b) Income from Services

(c) Fees/Subscriptions

(d) Income from Royalty, Publications etc.

2.50 About efforts being made by DARE to augment their revenue generation, the Department stated that institutes are encouraged to

augment their revenue generation by way of increasing their produce, providing technical support (sample testing) and taking up consultancies without affecting their own institutional research programmes. They are also advised to take up externally funded projects for implementing some of the important programmes. The issue has been reviewed in ICAR and for the Current Financial Year (CFY), the targets for revenue generation have been substantially increased in respect of each unit. The overall target has been raised to Rs. 10964.10 lakh for 2014-2015 raising it from Rs. 5306.38 lakh achieved during 2013-2014.

2.51 On the issue of internal revenue generation, the representative of DARE has stated as under:—

> "..... As far as internal resources are concerned, every year our average is from 40 crores to 50 crores. This is direct internal resource. It includes all our produce be it plants, seeds or eggs. But, if we calculate total revenue, it comes to 200-220 crores approximately. We are having about 40 to 50 crore rupees. We have set up 10 business process units. We intend to set up more...."

(9) Financial Irregularities

2.52 When asked to submit details of cases of financial irregularities reported in the Institutes of ICAR to the DARE since 2012-13, the Department stated that relevant information on this aspect is being collected from the institutes of ICAR and will be submitted to the Committee in due course of time. When asked about time required by DARE to collect these information, the Department has stated that information seeking the status of financial irregularities since 2012-13 from the ICAR Institutes under this point is under compilation. In view of the fact that there are more than 100 Institutes in ICAR under various SMDs, scattered through the length and breadth of the country, the above compilation will take time. It is, therefore, requested that ICAR may be permitted to furnish the requisite information by 30th Nov., 2014.

CHAPTER III

MAJOR CHALLENGES

(1) Challenges Before Indian Farming due to Climate Change

Of the late, climate changes associated with increasing average temperature monitoring due to rampant use of fossil fuel in industries and automobiles has emerged as major challenge before farming community across the world. It has been assessed that it will adversely affect Indian agriculture in the near future. Therefore, it becomes imperative to devise ways and means and develop plant varieties which can withstand changes associated with climate. The minimum temperature of change an annual basic over the entire country were completed using 0.5 degree grid data from climate research units. The magnitude of change an annual basis over the entire country is 0.25 ^{o}C over a 10 year period and the extend of area with a strong increasing trend farms about 81.8% of total geographical area. Average amount of monsoon rainfall, however, decreased as indicated by a study in North East Region.

(2) District Level Vulnerability Atlas

3.2 District level vulnerability atlas was prepared by ICAR to develop and target appropriate adaptation measures in regions that are more affected by climate change. The Atlas classifies vulnerable districts into very high, high, medium, low and very low categories, based on the combined evaluation of exposure, sensitivity and adaptive capacity, as per the IPCC protocol. According to DARE the terminal heat stress conditions across all the districts in six wheat growing States of Haryana, Punjab, UP, Rajasthan, Bihar and Madhya Pradesh were monitored. As per district level vulnerability atlas of climate change, there are 115 districts which are highly vulnerable, out of which 18 are in Uttar Pradesh, 16 in Madhya Pradesh, 15 in Bihar, 09 in Haryana, 07 in Chhattisgarh and 06 each in Jharkhand, Gujarat and Rajasthan.

3.3 When asked about measures required to adapt to the climate change, the Department have stated that a number of technological, institutional and policy interventions are required to effectively adapt to the changing climate. These include development of suitable crop varieties and natural resource management practices along with institutional

interventions such as access to mechanization and others. Policies are also required for enabling access to safety-net mechanisms.

3.4 Further the Department has stated that under ICAR, a mega project NICRA (National Initiative for Climate Resilient Agriculture) was instituted in 2011. The project aims to enhance resilience of Indian agriculture to climate change and climate variability through Strategic Research, Technology Demonstration, Capacity Building and Sponsored/ Competitive Grant Projects. The research on adaptation and mitigation covers crops, livestock, fisheries and natural resource management. Under this project, 130 model villages have been established in climate vulnerable 130 districts. Several climate resilient interventions like water harvesting, direct seeded rice, alternate wetting and drying, green manuring, deep placement of fertilizers and feed supplements for livestock have been demonstrated on farmers fields with a target of expanding these practices horizontally to other districts.

3.5 The Department enumerating the steps required to be taken for tackling problem arising due to rising temperature stated that adaptation options like growing varieties tolerant to thermal stress, changing planting dates, efficient irrigation and fertilizer management and application of additional nitrogen are some of the measures found to be beneficial. Early sowing of crops results in early panicle initiation and accumulates the desired cumulative degree days in some genotypes resulting in better grain yield than under normal sown crop. At the Directorate of Rice Research, Hyderabad, genotypes with high remobilization efficiency performed better under high temperature.

3.6 The Department have stated that Central Research Institute for Dryland Agriculture (CRIDA), Indian Council of Agricultural Research (ICAR) has developed detailed district-wise contingency plans to provide a broad advisory to farmers at the district level, prescribing alternate strategies in the event of climatic variability, by factoring in crops/livestock/ aquaculture practices/pattern, soil characteristics, infrastructural facilities etc. These plans are developed based on certain simulated models for different weather conditions like occurrence of drought, flood, cyclones, frost/cold wave etc. CRIDA has so far prepared Contingency Plans for 500 districts of 23 States.

3.7 Elaborating on the issue, the representative of Department of Agricultural Research and Education has stated as follows:—

> "..... now-a-days, climate is changing resulting in extreme weather conditions like we saw in Uttarakhand last year, in Kashmir at present. It has been asked from us how we take up research and

projects. I would like to say that Indian Council of Agriculture Research has a defined process regarding prioritisation. We have a long term vision of development upto 2030 and 2050, so that young scientists could know the direction of our research. Along with this, it has also become the main issue as to how we should react and respond to the situations arising every year or after every two years. Recently in 2014 the monsoon has been erratic, during the last four years, the monsoon has been very good at almost all the places except Bihar and few other places. But we can see how the monsoon behaved this year since March 2014 and from June to September, now we have had rains at every place except a few places like Telangana. Still average rainfall has been 11 per cent below to normal monsoon. That's why I would like to submit that there has been a debate in Parliament also to have a district contingency plan for all the 571 districts to deal with delayed rainfall and less rainfall. There have been floods at some places of Bihar and Uttar Pradesh.

That's why I am submitting that we have discussed with all the stakeholders including State Governments and Universities regarding contingency Plan. Thereafter it was implemented for the first time and we got feedback from many places, it has been very useful. We are implementing a special project named National Initiative on Climate Resilient Agriculture. I would like to submit that perhaps we are the only country in the world who talks about climate change very proactively. The last four years have seen very good planning in this regard. We have organised demonstration programmes about water conservation through Krishi Vigyan Kendras in 100 villages. In these demonstrations we have educated the people as to how we can adopt short duration varieties and new varieties. How we can go for cooperative farming and mechanisation in small land holdings. I am not saying that all these efforts were successful. I would like to say that we grow so many varities in our country, we have learnt many lessons and have been successful too. I can give you some examples, districts Anantpur of Andhra Pradesh, district Bikaner of Rajasthan and many more such districts witnessed 300, 450 and 500 mm rainfall. We can get minimum Rs. 80,000 to 1 lakh per hectare from rain based farming even in these districts. I would also like to say that now-a-days, there is a trend of growing three crops like Paddy, Pulse and Wheat and we have also started growing green gram during summer. Earlier, summer green gram used to take 65-70 days but now-a-days, we have a variety which just require 52-55 days."

(3) Soil Erosion Areas in Punjab

3.8 Agriculture intensification to meet the food and nutritional demands of geometrically multiplying Indian population has led to over-exploitation and degrdation of natural resources besides deteriorating the environment. Accelerated pace of industrialization has *inter alia* led to soil erosion thereby exasperating the health quality of soil. Soil erosion map of Punjab revealed that about 10 per cent (5,751 sq. km.) area falls under the category of very severe erosion, about 5 per cent (2,396 sq. km.) experiencing moderate to severe erosion and more than 85 per cent (47,248 sq. km.) is under slight erosion.

3.9 Elaborating on the issue, the representative of Department of Agriculture Research and Education has stated as follows:—

> "……we have soil erosion map. For example in Punjab, five tonnes of soil per hectare and sometimes 25-30 tonnes per hectare is eroded every year. So how should we manage soil health. In this scenario, we can use bio-fertilizers, I can tell many such things. You will ask for research in this regard. Nano-fertilizers like Nano-Phosphorus, Nano-Mangnese, zink, iron have been used for the first time. Earlier, we used 50-60 kilogram of phosphorus, now-a-days 5 to 8 kg. of Phosphorus is sufficient. It is not being used in labs, but it has been provided to companies. We discussed about varieties of wheat, 90 companies have procured these varieties. I can quote many such examples. But, at present new varieties and soil health is very important….."

3.10 When asked about remedial measures being undertaken to address this severe erosion problem in Punjab, the Department stated that following remedial measures are being taken to address the severe erosion problem in Punjab:—

(a) Integrated watershed management with emphasis on catchment treatment to reduce sediment flow.

(b) *In-situ* soil moisture conservation for establishment and growth of tree-based and mixed species production systems.

(c) Diversion of excess runoff during monsoon season to water harvesting structures for supplemental irrigations.

(d) Establishment of permanent cover on the current fallows for proper resource utilization.

(e) Adoption of silvi-pastoral or horti-pastoral systems with emphasis on cover management for soil and water conservation.

(f) Ensuring peoples participation in sustainable natural resource management.

3.11 Further enumerating the steps taken by the Department of Agriculture and Co-operation (DAC) and the State Government of Punjab to tackle the problem of soil erosion, the Department stated that the Department of Soil and Water Conservation, and Department of Rural Development, Government of Punjab through different State and Central Government Schemes are addressing the problem of erosion through integrated watershed management programmes like: (a) Soil and Water conservation on watershed basis in Kandi non-project areas: Ongoing State Plan Scheme to increase productivity in rainfed areas (Kandi area) through management of rainwater; (b) Scheme for Pilot Projects for Reclamation of Special Problematic and Degraded Lands in the State (TDET); The National Watershed Development Project for Rainfed Areas (NWDPRA) and Treatment of catchment area of Flood Prone River (FPR) have been implemented in selected 50 Micro-watersheds in Kandi area. Integrated Watershed Management Programme (IWMP) of Department of Land Resources. MoRD, GoI, has recently sanctioned six IWMP Projects for 17 Micro-watersheds falling in Gurdaspur, Hoshiarpur and Ropar districts. Degraded lands have been reclaimed and put under cultivation through soil and water conservation measures after checking the soil erosion in these areas. Integrated Watershed Management with participatory approach is the key to success of these projects in Punjab.

(4) Establishment of Soil Testing Labs

3.12 Soil Health Management (SHM) is one of the most important interventions under NMSA. SHM aims at promoting Integrated Nutrient Management (INM) through judicious use of chemical fertilizers including secondary and micro-nutrients in conjunction with organic manures and bio-fertilizers for improving soil health and its productivity; strengthening of soil and fertilizer testing facilities to provide soil test based recommendations to farmers for improving soil fertility; ensuring quality control requirements of fertilizers, bio-fertilizers and organic fertilizers under Fertilizer Control Order, 1985; upgradation of skill and knowledge of soil testing laboratory staff, extension staff and farmers through training and demonstrations; promoting organic farming practices etc.

3.13 It has often been seen that farmers in the country use large quantity of chemicals in absence of information on quality of soil and type of fertiliser required to get good harvest. Rampant use of fertilizer has led to enhancing cost of cultivation as well as adverse impact on soil health. Against this background, it become imperative to provide facilities to farmers for testing soil quality. When asked about steps taken by the DARE to establishment of facilities for soil testing, the representative of DARE stated as under:—

> "…..Sir, you mentioned about soil testing. I would like to submit that there are around 390 soil testing labs in the KVK network. 150 more labs are proposed to be set up during XII Plan. As you have stated it is our target to analyse 2000 soil samples during a year. Right now, 1000 samples are being analysed. You are aware that there are almost 13 to 14 crore farms holdings. Even if we analyse soil samples after the gap of a year, there are 7 crore soil samples for analyses. The volume of work is huge. As the Hon'ble Chairperson has said we are in talks with the Department. Several rounds of talks have been held during three months. We have Krishi Vigyan Kendras. Deliberations are going on for starting a scheme where we propose to train 50 youths at 1000 places for soil analysis and we just supervise it and not do it ourselves. It involves large scale of work. I would like to say it frankly that it would not be possible for us to do it all….."

3.14 Elaborating on the issue, the representative of Department of Agriculture Research and Education has further stated as follows:—

> "…..we establish soil testing labs. The regular person there may do all the soil testing but he cannot do it all. We are deliberating over having students on contractual basis for the jobs and we might give them some incentive. We are trying to do it all. You mentioned youth, we are all concerned about them. We are offering incentives, scholarships, entrepreneurships and several other things. We are in talks with other Ministries too like Rural Development, Human Resource Development etc…."

3.15 During a local visit of the Committee to ICAR in Delhi the Committee were informed that Pusa Digital Soil Test Fertilizers Recommendation (STFR) meter—a programmable, portable, low cost, digital equipment that brings soil testing at farmer's doorstep have also been developed. The equipment can compatively estimate 5—soil parameters *viz.* EC, pH, organic carbon, available P and available K and prescribe fertilizer recommendation on the basis of targeted yield approach. According to the Ministry the technology has a great potential

to be used by village panchayat for an on the spot soil testing and also to offer employment to rural youth.

(5) Development of Nutrient Fortified Cereals to Fight Undernutrition/ Malnutrition

3.16 The Department in their Annual Report while referring to study on "estimate of undernutrition (caloric deficiency) and malnutrition (protein deficiency)" have stated that more than half of the income poor population was calorie deficient in both rural and urban areas across all the choices of norms. Incidence of undernutrition and malnutrition was much higher based on ICMR-NIN norm. It is further stated that undernutrition was not confined to poor households. Such a population can be termed to be suffering from 'involuntary hunger' as they do not have the necessary income resources to take care of the quantity aspect of their intakes. However, more than 50% of middle income and more than 30% of upper income households were also found consuming lower than required dietary energy. These individuals can be termed as suffering income resources but still they are not consuming—may be out of choice or due to other non-income factors. The percentage of population with inadequate protein intakes was higher in urban households as compared to their rural counterparts.

3.17 When asked about efforts made by DARE to encourage research and development of nutrient fortified cereals, the Department has stated that they encourages research efforts through various research institutes in ICAR and SAUs for genetic enhancement for nutritional traits in maize, sorghum, rice, wheat, pearl millet and small millets. In addition, a special Consortium Research Project on Biofortification has also been proposed during XII Plan to intensify research efforts with special focus on R&D on fortified cereals. Iron fortified rice and vitamin fortified pasta products have been developed at CIPHET Ludhiana. An ICAR-ICMR collaborative research project entitled "Health foods from agricultural, livestock and aquatic produce" is proposed for XII Plan. This project has been formulated to generate output in terms of functional food products and nutraceuticals to combat malnutrition and lifestyle diseases. Due to the earlier efforts, several varieties have been developed with enhanced nutritional quality as given below:—

(i) Rice (High Zn > 25 ppm and Fe > 15 ppm)

(ii) Maize (High lysine and tryptophan)

(iii) Wheat [YE – yellow pigment (>6.0); Fe – Iron (>45 ppm); Zn—Zinc (>40 ppm); Cu – Copper (>6 ppm); Mn – Manganese (>45 ppm)]

(iv) Pearl millet (> 50 ppm Fe and around 40 ppm Zn)

(v) Small millets.

3.18 When asked to indicate efforts made to popularise use of nutrition rich food such as Ragi, Bajra etc., the Department stated that efforts have been made to develop and popularize different machine made food products based upon nutrient rich cereals/pseudo-cereals like Ragi, Bajra, Sorghum, Barley etc. These include:—

- Dehuller and pearler for millet flour
- Gluten free muffins from barnyard millet (Sawa millet)
- Pearl millet-WPC based extrudates
- Pearl millet based Instant Halwa mix, upma mix, porridge
- Vegetable blended Pearl millet-wheat based composite pasta
- Barley based and pearl millet based composite pasta
- Barley-Pearl millet –WPC based weaning mix

3.19 Regarding the efforts to popularise these products, the Department stated as follows:—

- CIPHET, Ludhiana has organized three trainings on 'Processing and Value Addition of small millets' sponsored by Department of Agriculture and Cooperation, Ministry of Agriculture, GoI under the programme – Initiative for Nutritional Security through Intensive Millet Promotion (INSIMP).
- Pamphlets on technologies for pearl millet based foods have been printed in three languages *viz*. Hindi, English and Punjabi and the same were distributed among farmers during exhibitions, trainings, and Punjab Agriculture University (PAU) Kisan Melas.
- The products were also displayed during PAU Kisan Melas and other exhibitions etc.

- "Pearl millet based extrudates and composite pasta" has been successfully transferred to two different entrepreneurs.

3.20 The Department also stated that there has been conscious effort to take-up programmes on nutrition and to promote coarse cereals. During the year 2013-14, 2313 demonstration on millet crops including barnyard millet, finger millet, proso millet and pearl millet were laid out to sensitize the farmers. In order to address micro-nutrient deficiencies among rural families, 510 nutritional gardens were established in adopted villages of 9 States. Commonly used recipes were selected and modified by AICRP centers to obtain a minimum of 6-8 mg. of iron/serving.

3.21 Further, the Department stated that to encourage consumption of coarse cereals, the Directorate of Sorghum Research (DSR), Hyderabad has partnered with fast moving consumer goods majors like Britannia, ITC and eight other companies to provide assistance in R&D and promote sorghum-based products in the country. DSR has also launched various sorghum based ready-to-cook and ready-to-eat products, including multi-grain and sorghum atta, pops, rawa, roasted flakes, vermicelli, cookies and pasta under its brand "Eat Rite". Any dish made with rice can now be made with Sorghum.

MoUs with 15 firms have been signed and around 100 clusters across the country function with DSR technology. Besides, DARE provides technological backstopping to a programme on Nutri-Farms being conducted by Department of Agriculture and Cooperation in selection of bio-fortified food crops enriched with critical micro-nutrients to improve nutritional status of the vulnerable sections of the population of the country. This scheme was implemented during 2013-14 in 100 high malnutrition burden districts of nine States namely, Assam, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh and Uttarakhand. The Department has stated that with regard to the status of Research and Development of nutrient fortified cereals, the process for initiation of the project is under progress. ICAR-ICMR collaborative research project entitled "Health foods from agricultural, livestock and aquatic produce", proposed for XII Plan, the Department submitted that the 23rd EFC Meeting of XII Plan of DARE/ICAR was held on 17th July 2014 under the Chairmanship of Secretary, DARE and DG, ICAR. The project is approved to the tune of Rs. 127 crores in the minutes/proceedings of above EFC meeting. It will be launched as soon as funds are made available.

(6) Arsenic Contamination in Ground Water

3.22 Arsenic contamination in ground water is one of the serious problems faced by the country. The ground water extraction from tube-wells for irrigation is reportedly adding large quantities of arsenic every year in agricultural fields, resulting in high build-up of arsenic in soils and subsequent accumulation in crops and vegetables. Arsenic toxicities are found in Malda, Murshidabad, Nadia, North and South 24 Parganas and Bardman districts of West Bengal adjoining Bhagirathi river. About 3 crores people inhabiting a belt of 34,000 km^2 are exposed to the risk of arsenic poisoning through intake of contaminated water and food. According to one estimate, confirmed cases of illness due to arsenic poisoning in over 2 lakh people. People exposed to chronic arsenic toxicity suffer from arsenical melanosis and hyperkeratosis, skin cancer, enlargement of liver, non-cirrhotic portal fibrosis, and respiratory disorders. In severe cases, gangrene in the limbs and malignant neoplasm are also observed. In animals also, arsenic poisoning causes many abnormalities.

3.23 The Department have explained that problem seems to have arisen due to heavy withdrawal of ground water when its availability is minimum for summer paddy, causing oxygenated decomposition of pyritic sediments containing high amounts of arsenic. These sediments upon oxidation release sulphuric acid, which solubilizes arsenic. The solution moves down to aquifers in due course of time, polluting the ground water. As per WHO guidelines, arsenic concentration in ground waters above 0.01 mgL^{-1} is considered to be unsafe from health point of view.

3.24 The ICAR conducted research on the genesis, severity and mitigation options of arsenic contamination in West Bengal. Results show that arsenic levels are generally prohibitive in the ground water at shallow depths of <125 ft. Surface water (ponds, shallow wells) and ground water at greater depths (>250 ft.) usually did not contain toxic levels of arsenic. As ground water is the predominant source for irrigating crops in the affected areas, there is accumulation of arsenic in the produce. The *boro* or summer rice using large quantities of under ground water contained more arsenic than kharif rice. The edible parts of leafy and under ground vegetables (spinach, fenugreek, beet and radish etc) contained much higher arsenic than vegetables (brinjal, beans, lady finger, tomato etc.). Abnormalities with symptoms akin to those of arsenic poisoning have been detected in over 40% of animals (cattle and goats) inspected in the area. Arsenic intake by animals was low through drinking water and more through feed sources.

3.25 The Department has also stated that to mitigate the problem, the *boro* rice requiring more ground water should be replaced with other suitable crops. Various legumes and pulses hold promise in this regard. While the farmyard manure application moderated the toxic effect of arsenic in soil-plant system, phosphate application aggravated it. Reduced irrigation coupled with application of zinc sulphate also reduced arsenic content in soils and plants without affecting yield. Use of organic and green manures moderated arsenic toxicity in soil-plant system by forming organo-arsenic complexes. Phytoremediation employing hyper-accumulating plant/microbial spp. like brake fern (Pteris vittata), water hyacinth (Eichornia crassipes) and others also holds promise in detoxification of arsenic in soil and aquatic systems. Blue green algae (BGA) having ability to decontaminate soils of arsenic may be introduced in the paddy fields.

3.26 When asked to furnish details of arsenic resistant food crops, if any, developed by ICAR, the Department have stated that studies have been taken in India to tackle the problem of Arsenic content in crop plants. Under NAIP project on " Arsenic in food-chain: cause, effect and mitigation", the genome sequencing of two arsenic transforming bacteria indicated that Arsenic resistance gene (Ars.) was present in both the strains, but neither arsenic respiring gene (Aro.), nor arsenic oxidizing gene (Aro.) were present suggesting role of some other molybdenum containing enzymes as well as arsenic transformation process as was abundantly present in the environmental isolates. A number of pathogenecity genes were recorded.

3.27 The Department has further stated that practical mitigation strategies that have been suggested for reducing the problem of As toxicity include provision of irrigation water sources from deep tube wells, use of soil amendments (liming), growing hyper-accumulator plants, organic manuring, removing contaminated soil speciation of As and using alternative cooking methods, substitution of cultivating *boro* rice by summer legumes and pulses which require reduced irrigations coupled with addition of zinc sulphate, more use of organic and green manures moderating arsenic toxicity in soils and plants and phytoremediation employing hyper accumulating plants and microbial spp (blue green algae) etc. Wide variation has been observed among the rice varieties in terms of As accumulation. Some rice varieties are capable of excluding As even when they are grown in soils/water having higher arsenic content. Thus, identification of high yielding varieties that exclude As at root level are desirable apart from other remedial measures to check built up of the

As in the soil. Altogether about 200 rice genotypes have been screened and evaluated during last ten consecutive cropping seasons for selecting low grain arsenic accumulating cultivars suitable for vast arsenic contaminated areas of West Bengal as well as for developing popular high yielding varieties coupled with low grain arsenic content. The categorization of low and high as accumulating genotypes is given in the tables below:—

Table 1: Grain arsenic level (μ/kg) in some rice germplasm at three sites (Purbosthali, Chinsurah and Birnagar) in West Bengal

Germplasm Accession No./Name of Cultivars	Purbosthali 1, Burdwan	Chinsurah, Hooghly	Birnagar, Nadia
	Category-I (high grain As)		
BRG-12	2196.72±106	1471.33±271	2309±539.32
BRG-15	1050.65±197.07	2094±89.10	1034±182.01
BRG-20	1177.66±92.63	1221.36±217.73	2650±590.99
	Category-II (low grain As)		
CN 1646-2	70±11.0	43±4.2	156±35.0
CN 1643-3	90±9.0	73±6.1	186±23.0
Nayanmoni	71±13.0	46±1.7	202±14.0
IET 19226	73±6.7	64±2.6	174±36.0
CN-1646-5	98±9.2	69±5.7	179±13.0
Soil As level (mg/kg)	10.43±1.53	12.59±1.82	15.54±1.32
Water (irrigation) As level (μg/l)	27.03	16.50	52.85

Table 2: Physicochemical properties of Arsenic contaminated soils from three field locations

Parameter	Chinsurah	Purbosthali-I	Birnagar
1	2	3	4
pH	7.6±1.08	8±0.17	7.2±0.26
EC (μs/cm)	74.16±6.98	116.56±28.02	137.73±27.20
Porosity (%)	77.69±3.99	76.96±6.69	76.02±1.85
TOC (%)	0.69±0.01	1.67±0.10	1.22±0.13
Available Nitrogen (%)	0.54±0.05	0.354±0.02	0.67±0.01
WHC (%)	87.77±1.89	80.63±1.75	86.13±2.36

1	2	3	4
Metals (mg kg^{-1}dw)			
Total As	12.43±1.53	10.59±1.82	15.54±1.32
Fe	48326.24±890	17565.92±580	24436.08±693
Zn	93.52±16.49	61.88±11.59	61.8±22.668
Mn	295.24±38.89	357.32±27.30	209.04±40.13
Cu	44.08±3.99	14.4±1.98	13.96±2.19
Available P	848.58±33.4	760.25±86.7	581.22±10.6
Se	3.01±0.101	2.33±0.33	3.93±0.393
Mo	8.22±0.24	6.18±0.18	7.74±0.54

(7) Advance Price Forecast of Agricultural Commodity

3.28 It is observed from the Annual Report of DARE that advance price forecasts of 20 agricultural commodities provided by the network of ten market-intelligence cells before the sowing of crops have been used by farmers in pre-sowing decision-making. On the query regarding region-wise availability of price forecasts to all farmers in the country, the Department have stated that as per the Performance Budget (1997-98) of Department of Agricultural and Cooperation, the Market Intelligence Scheme is in operation since Second Five Year Plan, which has been converted into non-plan since 1990 and is continuing on regular basis. (Source: Department of Agriculture and Cooperation Performance Budget 1997-98).

3.29 The Department have stated that more scientific and systematic efforts were initiated through National Agricultural Innovation Project on "Establishing and Networking of Agricultural Market Intelligence Centres in India." The scheme started on 27th June, 2009 and ended on 31st March, 2014. Currently, the practice is continuing at NCAP (ICAR) through network of 16 centres located throughout the country which are as under:—

Institute Name	Commodities Allotted
1	2
Lead Centre: NCAP, New Delhi	
Collaborating Centres	
ANGRAU, Hyderabad	Chickpea, Groundnut, Maize, Cotton, Chillies
BHU, Varanasi	Tomato, Potato, Mango, Maize, Rapeseed

1	2
IABM Bikaner, Rajasthan	Cumin, Chickpea, Pear millet, Clusterbean, Coriander
CPRI, Shimla	Potato
GBPUA&T, Pantnagar	Potato, Fine Paddy, Tomato, Cabbage, Vegetable Pea
ICARNEH, Barapani	Ginger, Turmeric, Potato, Pineapple, Tomato
IIHR, Bangalore	Onion, Tomato, Mango, Pomegranate, Grapes
IIPR, Kanpur	Chickpea, Pigeonpea, Lentil, Black Gram, Green Gram
JAU, Gujarat	Castor, Pigeonpea, Potato, Cotton, Groundnut, Maize
JNKVV, Madhya Pradesh	Soybean, Chickpea, Maize, Mustard, Tur
KAU, Thrissur	Pepper, Tapioca, Coconut
OUAT, Bhubaneswar	Coconut, Cotton, Turmeric, Maize, Green gram, Ginger, Groundnut
PDKV, Akola	Green gram, Pigeonpea, Onion, Maize, Soybean
UAS, Bengaluru	Maize, Banana, Ragi, Red gram, Potato
YSPUHF, Solan	Apple, Tomato, Pea, Ginger, Maize
SKUAST, Shalimar	Apple, Walnut, Cherry, Pear

3.30 The Department also stated that farmers are currently receiving the price forecasts for the above regions/States and selected crops through the Network Project on Market Intelligence funded by Indian Council of Agricultural Research (from June, 2013 to March, 2017). The main aim is to generate price forecasts for major agricultural commodities and disseminate these to farmers before sowing and during harvests as to enable them to take informed and appropriate decisions regarding disposal of the produce.

(8) Menace of Parthenium Grass

3.31 In general, Parthenium is a poisonous, pernicious, problematic, allergic and aggressive weed posing a serious threat to human beings and their livestock. Problem of Unabated growth of Parthenium or Gajarghas is being faced by farmers in the large part of the country. It has affected availability of fodder for cattles, thereby directly affecting income of farmers. Parthenium hysterophorus locally called 'Gajarghas'

or 'Congressgrass' has spread throughout India after its noticeable occurrence in Pune in 1956. Now it has achieved the status of "worst weed" owing to its allelopathic effects on agricultural, horticulture and forestry ecosystems and harmful effects on man and animals. It is estimated to spread in about 35 million hectares of land in India. The spread of Parthenium has been reported from all States of India. In general, the overall spread in terms of density and infestation level was reported highest in Andhra Pradesh, Bihar, Chhattisgarh, Haryana, Karnataka, Maharashtra, Madhya Pradesh, Punjab, Tamil Nadu and Uttar Pradesh. The overall spread and infestation level of Parthenium was medium in Assam, Gujarat, Himachal Pradesh, Jharkhand, Jammu and Kashmir, Uttarakhand, Orissa, West Bengal and Rajasthan, The spread was low in Andaman and Nicobar, Arunachal Pradesh, Goa, Kerala, Manipur, Mizoram, Meghalaya, Nagaland, Pondicherry and Sikkim.

3.32 The Department has informed that till 1980, Parthenium spread was restricted mostly to uncultivable land. But now, it has spread in almost all types of cereal, pulse and vegetable crops besides pasture ecosystems. Its infestation has been reported more in rain fed than irrigated agriculture. In general, the weed has spread in every type of land and climate of India. Earlier, it was not considered a weed of orchards and forests but now it has spread rapidly in these areas too. In many forests, National Parks and Reserved forests, the occurrence of this weed has been noticed. The weed has also been observed at alarming rates in Pench National Park in Seoni District of Madhya Pradesh and in Kanha National Park in plenty in buffer zone and in low profile in core area too. The Parthenium has become a problem in Van Vihar National Park in Bhopal where large area has been occupied by the weed. It has become a great problem in Corbett National Park. Due to its infestation, herbivores are not getting sufficient grass and thus disrupt food chain. In India, this weed has been considered as one of the greatest source of dermatitis, asthma, nasal-dermal and naso-bronchial types of diseases.

3.33 When asked to explain ways to control growing problem of parthenium grass, the Department stated that ever since the weed became a menace in India, efforts are being made to manage the weed by different methods. But so far, no single method has been proved satisfactory as each method suffers from one or more demerits such as high cost, impracticability, environmental safety, temporary relief etc.

(i) Mechanical and Manual Methods

This method may be applicable in all type of ecosystems. The relief from this method is temporary and needs to be repeated on reappearing

of the weed. Mechanical removal with the help of tractor, plough, etc., is possible up to certain extent and that too only in open fields. Mechanical or manual methods for uprooting of Parthenium should be started before flowering. This method is practicable only in high valued crop.

(ii) Cultural management

This method may be applicable in crop ecosystem. It has been observed that in some crop fields Parthenium grows profusely. To reduce the seed bank in such crop field, some fast growing crop species of fodders like berseem and sorghum can be taken to suppress Parthenium and its seed bank in the field.

(iii) Chemical management

The chemical approaches may be applied in waste land, crop land, and orchards in ecosystems. It is easy to use herbicides in wasteland situation where there is no danger of crop damage but in crop ecosystem, expert knowledge is required to apply suitable herbicide depending on the crop in the field.

(iv) Biological management

Biological control of Parthenium through al leaf feeding bioagent Zygogrammabicolorata has been considered most successful in waste land, community land, and horticulture and forestry ecosystem. In agriculture ecosystem, large scale augmentation of bioagent may be successful. In waste land and on the road and railway track side, replacement of Parthenium by competitive plant Cassiatora and C. Sereicea may be recommended.

(v) Management through utilization

Utilization is best tactic to mange any weed, therefore, efforts have also been made to use Parthenium. Technologies were developed to make compost from flowered uprooted Parthenium through pit methods. Seeds become completely dead by this method.

(vi) Integrated management

To overcome the Parthenium menace, integrated management has been considered to be the only viable solution.

When asked about efforts made to reduce the menace of Parthenium

in future, the Department has stated that Directorate of Weed Science Research is doing tremendous efforts through research and extension services to lower down the impact of Parthenium in the country. Many research and popular articles have been published by DWSR for different management practices of Parthenium besides bulletins and books. For eco-friendly biological control of Parthenium, cheap technologies have been developed to mass multiply the host specific bioagent Zygogrammabicolorata. The culture of this bioagent was distributed throughout India by postal service in special containers developed at the Directorate to reduce the mortality of live bioagent during postal transportation. So far, about 8 lakhs bioagents have been distributed free of cost to farmers, municipalities, NGOs and interested persons throughout country for further establishment in the concerned region. Due to Directorate's efforts, now bioagent has established in many parts of India and helping to lower down the impact of Parthenium. At many places, due to continuous attack by the bioagent Zygogramma bicolorata, other vegetation has come up.

3.34 The DARE has informed that Directorate of Weed Science Research (DWSR) has made special efforts to make people aware about the ill effects of Parthenium on men and animals besides loss to crop productivity and biodiversity. For this purpose, DWSR observed every year 'Parthenium Awareness Week' from 2004 to 2013 involving all the State Agricultural Universities (SAUs), KrishiVigyan Kendras (KVKs), ICAR institutes, many NGOs, schools, colleges, etc. To facilitate successful implementation of the programme, DWSR published posters, extension pamphlets and made video films on Parthenium and distributed among stakeholders. This particular effort created awareness among public about the ill effects and management of Parthenium. Now 2014 onward, Directorate is making appeal to all KVKs, SAUs and ICAR institutions to make their campus Parthenium free by doing regular management of Parthenium. Elaborating upon the issue, the representative of DARE has stated as under:—

> ".....Gajar Grass which we call Parthenium. We are trying to control it but then control measures are really difficult. We have tried chemicals, now we are trying some beetles that can feed on that. All this we are trying. But it requires something like Swachhata Abhiyan which we are thinking. We do need similar efforts for control of Parthenium and Lantana. These two are really major issues. We have technology but to scale it up we require everybody's involvement...."

(9) Eco-friendly Low-Cost Waste Water Treatment and Reuse in Agriculture

3.35 Agricultural reuse of wastewater, under freshwater scarcity, is fast becoming popular worldwide because it closes the loop between water demand and wastewater disposal and enhances fertilizer security of resource poor farmers. However, due to lack of proper treatment facilities and awareness in developing countries, unplanned application of raw wastewaters is increasing the risk of agricultural sustainability and consumer/environmental health.

3.36 During study visit to IARI, Pusa, the Department has informed the Indian Agricultural Research Institute (IARI) evolved an innovating and eco-friendly wastewater treatment facility in its Delhi campus. The newly created facility utilizes emergent wetland plants (s.a. Typha Latifolia), local media, and native microorganisms, present in natural wastewaters, for treating 2.2 Million Litres per Day (MLD) of sewage waters. The eco-friendly sewage treatment plant (e-STP) is spread over 1.42 hectares and is capable of irrigating 132 ha. of IARI farmlands. Long term monitoring of the treatment capacity of so developed wastewater treatment plant of IARI, over last 1.5 years has revealed its exceptional performance especially *w.r.t.* Turbidity (99%), BOD (87%), Nitrate (95%), Phosphate (90%), Lead (81%), Iron (99%) and other pollutants normally present in local municipal wastewaters.

The Department has further informed that comparison of this eco-friendly Pusa wastewater treatment system with the conventional wastewater treatment systems has shown that Pusa technology is associated with just 1% energy requirement of the conventional system; zero-chemical application; zero-sludge generation; 50-65% reduced treatment cost and no skilled manpower requirement. Additionally, the planted biomass in each treatment cell of the fully operational wastewater treatment system can be harvested, once every two months, to yield 12 tons of dry biomass per annum per cell that can be either transformed to particle board (9000 sq. meters per annum; market price Rs. 200-250/ sq. meter) or sold to particle board manufacturers (@ Rs. 2000 per tonne as dry matter) – thereby integrating the proposed decentralized wastewater treatment process with a self-sustainable Cash from Trash business model as well.

CHAPTER IV

SECTORAL PROGRAMMES

(1) Crop Science

4.1 Crop Science Division of ICAR, through its 26 research institutes, 22 All India Coordinated Research Projects (AICRPs) and 11 Network Research projects and in active collaboration with State Agricultural Universities (SAUs) is engaged in the development of improved crop varieties/hybrids, cost-effective production technologies and environment-friendly protection technologies. According to DARE during the year 2013-14, 104 new improved varieties/hybrids of different crops were released with good adoptability for different agro-climatic conditions of the country. An early- maturing (110-123 days) rice basmati variety, Pusa Punjab Basmati 1509 was released with moderate resistance to leaf blast and brown spot diseases. Wheat variety HD 3059, released for late sowing after cotton or late maturing rice in Punjab and Haryana, is an early maturing (121 days) variety resistant to all three rusts, including stem rust race Ug99 and its variants.

4.2 The Department have informed the Committee that through the efforts of ICAR, a total of 106 improved varieties/hybrids in different crops including 70 of cereals, 15 of oilseeds, 8 of pulses, 3 of fiber crops, 4 of forage crops and 6 of sugarcane have been released during 2013-14 for various agro-climatic zones of the country. About 381 novel genetic stocks of field crops possessing tolerance to biotic, abiotic stresses and superior nutritional qualities have been registered.

4.3 The Secretary, DARE submitted before the Committee:—

> ".....last year, in April 2013, we appeared before the Committee. We have developed around 160 varieties there is wheat, there is paddy, Basmati rice is talked about again and again. 1101 of Pusa is talked about. We developed 1509 later. 2967 is a variety of wheat. I would like to point out that at least fifty million tonnes of wheat's varieties is from Indian Agriculture Research Institute."

4.4 Similarly on the issue of development of better varieties of sugarcane, the representative of DARE stated as under:—

> "…...Now a days sugar recovery of 9%, 10%, 11% is difficult in sugarcane. We have released such varieties which contain sugar content around 14% to 16%. Sir, I would like to point out about sugarcane, that a variety CO9709 released by our Sugarcane Research Institute, Lucknow contains 14% of sucrose. It has been released very recently. You too know as to how the sugarcane agriculture is talked. It is kept outside for 4 days, we can increase it by 1% after enhancing its efficiency a little bit. I am not going to point out that it will reach 14%, but 14% has been released there. There is CO 9709 variety in Indian Sugarcane Research Institute, Lucknow."

4.5 Under the major head Crop Science, following allocations have been made during first three years against earmarked outlays of Rs. 1100 crore for 12th Plan:—

(Rs. in lakhs)

Year	Proposed fund by DARE	BE	RE	Actual Expenditure
2012-13	837.75	500.00	413.00	400.58
2013-14	628.01	465.00	375.00	368.98
2014-15	862.48	470.00		
Total	2328.24	1435.00		

4.6 Under the head of Crop Science, it can be seen only 34.65% (BE) of allocations were made as against on earmarked outlays of Rs. 4141.31 crore for 12th Plan. When asked about impact of reduced allocations on implementations of Research work in institutes under division of Crop Science, the Department stated that reduced allocations at RE stage, have resulted in the postponement of purchase of sophisticated equipments and incurring other research contingent expenditure to carry out certain cutting edge research activities. This has led to shifting select research activities to a later stage.

(i) Availability of Seeds

4.7 Adequate availability of seeds of good quality at reasonable price to farmers is utmost necessity for enhancing production and productivity of farm produce. It is also necessary to ensure making farming

a remunerative profession. However, it has been often been observed that farmers find it difficult to get quality seeds at the time of sowing. According to DARE, 11,835 tonnes of breeder seeds, 14,984 tonnes of foundation seeds, 22,281 tonnes of certified seeds, 14,939 tonnes of truthfully labelled seeds and 5,237 tonnes of planting materials were produced during the year 2013-14. What asked to explain efforts made by the DARE to enhance availability of quality seeds to farmers in the country, the representative of DARE stated as under:—

> "…..regarding breeder seed, I would like to point out that it is our responsibility to provide breeder seeds. Earlier, we used to have a yield of 80-90 thousand quintal from it. Presently all demand of every variety of breeder seeds from one lakh to one lakh ten thousand quintal is being met be it pulses and oilseeds. Time and again, a point comes up in this regard as to how much it has from public sector and how much from private sector. Now a days, there is a trade of seeds worth Rs. 12,000 crore. Participation of Private Sector is necessary as they only deal in hybrid seeds and some vegetable fruits. As I said, 50 trucks wheat, which we got through one or two varieities only belong to public varieties."

(ii) Development of Drought Resistant Crop Varieties

4.8 Large part of India is dependent upon monsoon for agricultural production. Farmers have to take risk of loss of income and livelihood whenever monsoon is weak or affected due to factors such as El-Nino, climate change etc. At the same time, due to delay or uncertainty associated with meteorological forecast for Monsoon, farmers are unable to shift farming practice leading to loss of investment. On an average 289 (107Mha) of country's geographical area is vulnerable to drought. During 2013-14 the Government of Bihar declared drought in 33 out of 38 districts.

4.9 It has been reported in Annual Report (2013-14) that variety of Ragi (Ragi cv. ML365) developed by UAS, Bangalore and introduced in drought affected village at KVK, Tumkur has produced superior performance compared to local variety it has also been mentioned that success of this intervention was evident during 2012 when a severe drought struck in Karnataka. When asked to furnish details of drought resistance varieties of cereals developed by the ICAR

during the last five years, the Department has furnished following information:

(i) Repelies of the Government

List of drought resistant varieties of cereals released during 2009-2014

Crop/ Year	2009	2010	2011	2012	2013	2014
1	2	3	4	5	6	7
Rice	Jagjeevan	IGKVR-1; IGKVR-2; CR Dhan 401 (REETA); RC Maniphou 11	-	Mugad Siri-1253	-	CR Dhan 407; VL Dhan 157
Wheat	-	Pusa Suketi; HS 507; Netravati	WH 1080; MP 3288; HD 3043	-	HPW 349; Narendra Wheat 1418	-
Barley	-	Pusa Losar	UPB 1008	-	-	Pusa Shetal (BHS 400)
Maize	Vivek Sankul Makka 35; Vivek Sankul Makka 37	MCH 36; PMH 5	Vivek Maize Hybrid 43; Vivek Maize Hybrid 39	-	-	-
Pearl millet	JKBH-676; RHB-154; HHB-223; HHB-216; Nandi-64	Nandi-65; Nandi-61; 86M64; MH 1540; MH 1541; RHB 177; HHB 226	PAC 909; 86M66; Mandor Bajra Composite 2	-	HHB 234; GHB-905	-
Sorg-hum	CSH 24	-	-	CSV 27; CSV 26; CSV 29 R; CSH-27	Wani 11/6 (PKV Ashwini); CSH 30 (SPH 1655)	HJ 541;
Finger millet	-	GPU 67	-	VL Mandua 347 (VL 347); Dapoli Safed-1	-	KMR 204; VL Mandua-352; Phuley Nachani
Little millet	SAURA	-	-	-	-	-
Proso millet	TNAU-164	-	-	-	-	-
Foxtail millet	-	-	-	-	SiA 3085; HIMA	SiA 3156

4.10 The Department has also stated that Central Research Institute for Dry land Agriculture (CRIDA) has also developed drought tolerant varieties of horse gram (CRHG-19, CRHG-18R, CRHG-4). Under the National Initiative on Climate Resilient Agriculture (NICRA), extensive screening of germplasm of wheat, rice, maize and pulses was carried out for drought, heat and flood tolerance and 100 most promising genotypes were identified for use as donors in breeding programs.

4.11 When asked to furnish details of targets and actual production of drought resistance varieties of seeds during the last five years, the Department have stated that a total of 207162 q breeder seeds of different varieties of cereal crops including that of drought resistant ones were produced against an indent of 165020 q during the last five years.

Regarding monitoring drought, the IARI stated that on an average, 28% (or 107 Mha) of the country's geographical area is vulnerable to drought. Historically people have been trying to monitor drought, though with limited accuracy, through the use of single meteorological indices. However, in recent years there is a growing trend towards the development and application of composite indices, through the combined use of the major meteorological, hydrologic and bio-physical parameters, for accurate drought characterization and monitoring. In an effort towards this direction, an Aggregated Drought Index (ADI) comprising of rainfall, ground water depth and crop evapo-transpiration variables was developed and successfully validated over UP State. The index was further improved through the addition of another hydrologic parameter *viz*., stream flow and the Revised Aggregate Drought Index was further validated on one of the most drought prone states of India *i.e.* Maharashtra. The results of this validation showed that the revised ADI could very successfully mimic both the onset and establishment of drought conditions that started developing from post 1998 monsoon seasons, subsequent to the monsoon failure in 1998 and the re-establishment of somewhat normal conditions subsequent to the normal monsoon in year 1999 thereby showing that the developed index has the potential to be up-scaled to a comprehensive the integrated drought Early Warning System (EWS).

(iii) Fixation of Prices of Commercialized Seeds Developed by ICAR

4.12 When asked to spell regulatory role of ICAR regarding fixation of prices of commercialized seeds developed by them, the Department have stated that ICAR is mandated to produce only breeder seed of varieties released for further use by stakeholders in production of foundation, certified and truthfully labelled seeds. As regards the breeder seed production, every year Annual Breeder Seed Review Meeting is being organized under the Chairmanship of DDG (Crop Science), ICAR

and Co-Chairmanship of JS (Seeds), DoAC and attended by ADGs (Crop Science), all Crop Coordinators, Project Directors, Directors, seed producing centres, officials of NSC/SFCI, State seed corporation etc. The Breeder Seed Sale Rate is fixed in the said meeting after due deliberations and also keeping in view the production cost and considering the interest of the farming community. The price of foundation and certified seed is decided by respective seed producing public agencies like NSC and respective State seed corporations, private seed companies as per the prevailing market rates and cost of production. The breeder seed price fixed for 2013-14 and 2014-15 are provided in Annexure-I and the quantity of breeder seed production has been given in Annexure-II.

(2) Horticulture Science

4.13 Horticulture sector includes a wide variety of fruits, vegetables, spices, root and tubes, mushroom, ornamental plants, medicinal and aromatic plants, nuts, plantation crops including coconut and oil palm and are grown in different agro-climatic conditions. As per the outcome budget of the Department with R&D network across the country, the horticultural scenario is changing rapidly in terms of production and productivity. Horticulture sector contributes approximately 30.4 per cent to Agricultural GDP and horticultural production now is 268.85 million tonnes during 2012-13 and has surpassed foodgrain production. According to the Department this has been possible due to advanced research; technology based scientific farming and Government policy. Globally, India is the second largest producer of fruits and vegetables. It is the largest producer of mango, banana, coconut, cashew, papaya, pomegranate and is the largest producer and exporter of spices. India ranks first in productivity of grapes, banana, cassava, peas, papaya etc. In monetary terms the growth in export of fresh fruits and vegetables is 14% while it is 16.27% in case of processed fruits and vegetables.

4.14 Under the major head Horticulture Science following allocations have been made during first three years against earmarked outlays of Rs. 1422 crore for XII Plan:—

(Rs. in crore)

Year	Fund proposed by DARE	BE	RE	Actual Expenditure
2012-13	360.30	240.00	145.00	143.55
2013-14	200.00	200.00	149.00	139.88
2014-15	308.38	210.00		
Total	868.68	650.00	294.00	

4.15 On analysis it has been observed that under this head only 45.71% (BE) allocations as against earmarked outlays of Rs. 1422.00 crore for XII Plan were made till 2014-15. Funds have been further reduced at RE stage. When asked to spell reasons for such low allocations, the Department stated that allocations are decided based on the funds made available at BE stage under Gross Budgetary Support (GBS) provided by the Planning Commission on yearly basis.

4.16 When asked to furnish reasons for drastic reduction of Rs. 51.00 crore *i.e.* 25.5% at RE stage during 2013-14, the Department stated that there was general cut across all the Ministries/Departments at RE stage by Ministry of Finance resulting in reduced allocations during 2013-14.

(3) Agricultural Engineering

4.17 Several institutes function under the Agricultural Engineering Division to achieve its mandated goals. To address region specific technological issues, Central Institute of Agricultural Engineering is linked with the whole country through All India Coordinated Research Projects. The network of AICRPs help in identification of specific regional problems needing engineering intervention. Under the major head Agricultural Engineering following allocations have been made during first three years against earmarked outlays of Rs. 1100 crore for 12th Plan:—

(Rs. in crore)

Year	Fund proposed by DARE	BE	RE	Actual Expenditure
2012-13	117.08	78.00	52.00	51.59
2013-14	99.30	75.00	55.00	54.60
2014-15	134.15	85.00	-	-
Total	350.53	238.00		

4.18 It is observed that under this head only 21.63% (BE) allocations as against earmarked outlays of Rs. 1100.00 crore for 12th Plan were made till 2014-15. Funds have been further reduced at RE stage. When asked to furnish reasons for reduction of allocations at RE stage during 2012-2013 and 2013-14, the Department stated that there was general cut across all the Ministries/Departments at RE stage by Ministry of Finance resulting in reduced allocations during 2012-13 and 2013-14.

4.19 When asked about impact of lower allocations on implementation of R&D work in institutes related to Agricultural Engineering, the Department has stated lower allocation of funds during the years 2012-13 and 2013-14 have affected the R&D work in Engineering Division of ICAR to some extent, which are as under:—

1. The activities relating to promotion of mechanization of small and marginal farmers and also the promotion of post harvest technology and alternated energy sources slowed down.

2. Cutting edge research and development work in precision farming, bio-energy, secondary agriculture and natural resins, gums and fibres could not be taken up to cope with the recent developments in other countries.

3. The consortia research platforms on Farm Mechanization and Precision Farming, Energy in Agriculture, Secondary Agriculture, Health Foods and Natural Fibres, which were to start at the beginning of the 12th Plan, could not be initiated till now.

4. The development work of state of the art laboratories for (i) precision farming, (ii) bio energy, and (iii) quality food testing could not be initiated.

5. The All India Network Project on Conservation of Lac Insect Genetic Resources could not be initiated.

6. Prototype manufacturing as well as supply to different stakeholders slowed down. Under prototype feasibility testing programme, institutes and centres of AICRPs carry out evaluation of different tools/farm machines/energy gadgets developed at other centres or some of the commercially available units. As the fund allocation was less, the centres could not procure the required equipment for Prototype feasibility studies and therefore, progress of these projects got affected.

7. In order to create awareness about improved tools/equipment technologies a large number of front line demonstration programmes are carried out by institutes and AICRPs through their centres. As the budget allocated was less, first priority was to meet the committed expenditure in Salary head.

Therefore, amount available under equipment head as well as recurring expenses was reduced. It resulted in delaying of some projects as well as the Number of FLD programmes conducted were less.

8. During the Workshops/Coordination Committee Meetings of various AICRPs, the R&D projects to be taken by different centres are decided. Due to the lower allocation of funds under BE as well as RE, the laboratory equipment needed for these new projects could not be procured and therefore, the progress of research work was slow.

4.20 Economic Survey (2013-14) brought out the fact that despite being one of the top countries in agriculture production, the current level of farm mechanisation, which varies across States, averages around 25% as against more than 90% in developed countries. It has also been stated in the survey that a dedicated submission on agricultural mechanisation has been started in the XII Plan, with focus on spreading farm mechanization in small and marginal farmers and regions that have low farm power availability. In view of the aims of the Government, institutes associated with agricultural engineering division are required to gear up R&D for development of suitable agricultural implements in order to enhance level of mechanization in agriculture and allied sectors. During the last three years 65 implements/instruments/machines, products/ processes have been developed and 551 demonstrations were conducted.

4.21 On the above issue, the representative of DARE has stated as under:—

"……you asked that what efforts are being made to promote mechanization for small farmers? I will definitely tell, there are many things like transparent deepler, wider etc. Earlier I told that today we have approx. 5000 prototypes public system. Our problem is this that to scale-up most of the time there is a multiply and in each village to which we call village saturation, we are not able to do that. That is why I told that it should be specially created in the XII Plan.…."

4.22 Further elaborating on the issues, the representative of DARE stated as under:—

"……small farm mechanization and how productive cultivation should be, small cultivation should be and good mechanization should be in small land-holdings. Now-a-days, we do not get people

to get the coconut and Areca nut off the tree and also do not get people for the care of cow and buffaloes. In each area may be its fishery or cow, how there should mechanization and there should be customized mechanization and it should not be that any instrument comes from foreign and we will use it. It is not possible at all. How to do mechanization in small land-holdings?…."

4.23 When asked to furnish details of commercialization of products developed by Agriculture Engineering division and revenue generated as license. During the last three years, the Department stated that 79 implements/machines/products have been commercialized. The revenue generated as license fee from commercialized products is Rs. 67,40,023/- (Sixty seven lakhs forty thousands and twenty three).

4.24 On a query regarding efforts made by the Department to popularise machines developed by the ICAR, the Department stated that popularization of developed machines/technologies/products is done through transfer of technology divisions, business planning and development units and institute technology management units with the following major activities:—

- Development of manufacturing technology, production process and product refinement of CIAE technologies.
- Popularization and promotion of technologies through prototype production and supply, monitoring and feedback.
- Popularization of improved technologies through exhibitions, extension literature, catalogues, electronic media, display and demonstration.
- Training of Farmers, Processors, Extension Officers, Subject Matter Specialists, KVK trainers, manufacturers, artisans and entrepreneurs for mechanization promotion.
- Commercialization of developed technologies.

4.25 About role of ICAR in fixation of prices of the products which has been developed by them, the Department stated that ICAR has implemented its guidelines on Intellectual Property Management and Technology Transfer/Commercialization, which provide these processes and practices. Each ICAR Institute has Institute Technology Management Unit, which is supported by a Committee to decide on the issues of legal. IPR protection and valuation/pricing/commercialization of intellectual

properties/technologies/products/services. The valuation/pricing and terms and conditions for licensing/commercialization emerges from the ground work of valuation, market research and business proposal development under the guidance of senior experienced scientists of relevant disciplines. Technology pricing/valuation is context-specific and can vary on case-to-case basis.

(4) Agricultural Extension

4.26 Agricultural Extension Division of the DARE implements a scheme on (i) "Continuation and establishment of new Krishi Vigyan Kendras (KVKs)", and oversees (ii) Directorate of Research on Women in Agriculture (DRWA) including AICRP on Home Science.

(A) Continuation and establishment of new 'KVKs'

4.27 The Krishi Vigyan Kendra Scheme include activities such as technology assessment, refinement and demonstration of technology/ products and its transfer through training of farmers and extension personnel, besides organizing extension programmes for creating awareness on improved agricultural technology. The scheme is being monitored through eight Zonal Project Directorates. The Department have stated that at present 641 KVKs have been established in the country as on date. Out of these, 4 KVKs have been established in a span of 3 months. State-wise details delineating State Agricultural University/ Central Agricultural University/State Government/Deemed University/ PSU/Other Government Organization is as follows:—

S.No.	States/UTs	SAU/ CAU	ICAR	NGO	PSU	State Govt.	CU/ DU/ OEI	Total
1	2	3	4	5	6	7	8	9
1.	Andaman and Nicobar Islands	0	3	0	0	0	0	3
2.	Andhra Pradesh	23	3	8	0	0	0	34
3.	Arunachal Pradesh	1	3	0	0	10	0	14
4.	Assam	23	2	0	0	0	0	25
5.	Bihar	31	1	5	1	0	0	38
6.	Chhattisgarh	20	0	0	0	0	0	20
7.	Delhi	0	0	0	1	0	0	1
8.	Goa	0	1	0	0	1	0	2

1	2	3	4	5	6	7	8	9
9.	Gujarat	16	2	7	0	0	3	28
10.	Haryana	14	2	2	0	0	0	18
11.	Himachal Pradesh	12	0	0	0	0	0	12
12.	Jammu and Kashmir	18	1	0	0	0	0	19
13.	Jharkhand	16	4	4	0	0	0	24
14.	Karnataka	24	2	5	0	0	0	31
15.	Kerala	7	4	3	0	0	0	14
16.	Lakshadweep	0	0	0	0	1	0	1
17.	Madhya Pradesh	39	1	7	0	0	0	47
18.	Maharashtra	16	1	26	0	0	1	44
19.	Manipur	1	5	2	0	1	0	9
20.	Meghalaya	0	2	0	0	3	0	5
21.	Mizoram	1	0	0	0	7	0	8
22.	Nagaland	0	4	0	0	4	1	9
23.	Orissa	31	2	0	0	0	0	33
24.	Pondicherry	0	0	0	0	3	0	3
25.	Punjab	20	0	0	0	0	0	20
26.	Rajasthan	33	3	4	0	0	2	42
27.	Sikkim	0	1	0	0	3	0	4
28.	Tamil Nadu	17	0	11	0	0	2	30
29.	Tripura	0	1	1	0	2	0	4
30.	Uttar Pradesh	49	5	10	0	0	4	68
31.	Uttarakhand	11	2	0	0	0	0	13
32.	West Bengal	11	1	4	1	0	1	18
	Total	434	56	99	3	35	14	641

SAU: State Agricultural University;
ICAR: Indian Council of Agricultural Research
NGO: Non-Governmental Organization;
PSU: Public Sector Undertaking;
CAU: Central Agricultural University;
CU: Central University
DU: Deemed University;
OEI: Other Educational Institution

4.28 Regarding norms adopted for establishment of KVKs in the country, the Department has stated that for the establishment of new

KVK the host organization should apply for consideration as per the requirements detailed below:—

(i) Land requirement: The land requirement for establishment of KVK is about 20 ha. The proposed land should be provided free of cost and fulfill the following requirements:

- The location of the proposed site should be easily accessible.
- The land should be contiguous and free from encumbrances, litigation and attachments.
- The ownership of land should be in name of the organization.
- The location should have educational, medical and other civic amenities near by.
- The land should be cultivable and should have easy access to electricity and water for irrigation.
- In the case of larger districts where additional KVK is proposed, the site of the second KVK should be at a place from where it can reasonably cater to the needs of the area under its jurisdiction in an effective manner.

(ii) Suitability of the host organization: The SAUs/CAU/CU/DU/ State Departments/PSU/ICAR Institutes/Other Educational Institutions/NGOs working in the field of agriculture are eligible to submit the proposals for a KVK in the rural district.

In the case of NGO, it should have

- Minimum five years of experience of working in the field of agriculture, rural development and/or natural resource management with appropriate governance structure and proven record of financial viability supported by valid documents.
- Willingness of the host organization to share its resources for growth and effective functioning of the KVK.
- Willingness and commitment to run the KVK strictly in terms of objects of ICAR as enunciated in rules and byelaws of ICAR Society.

4.29 The Department have also stated that available financial provisions of ICAR shall be supplemented by the host organizations to develop the KVK infrastructure in such way that the farm is a miniature of the agro-climatic situation of the district with all the crops and enterprises.

4.30 There is a provision of opening one KVK in each of the rural district of the country. However, in larger districts based on composite index ranking, one additional KVK is sanctioned.

4.31 When asked about basis of composite index ranking which is used for establishment of additional KVKs. The Department in their written replies stated that Establishment of one additional KVK in larger districts was taken up in 11th Plan to facilitate wider coverage of KVK activities. A composite index was developed combining three parameters with equal weightage for ranking the districts, *viz*. Geographical Area, Rural Population and Net Sown Area. The highest ranked districts could be selected based on the approval of EFC.

4.32 The Department stated that there are 45 Districts in 10 States where more than one KVK have been sanctioned.

4.33 When asked about target for opening of new KVKs during XII plan, the Department in their written replies have stated that total target for opening of new KVKs during 12th Plan is 121 which include 37 spill over KVKs of XI Plan. Out of the 37 spill over KVKs of XI Plan 11 KVKs have already been established during 12th Plan. With this the total number of KVKs to be established by the end of XII Plan will be 751. KVKs proposed to be opened during 12th Plan, target could not be taken up for want of approval of the Cabinet to the KVK Scheme of 12th Plan.

4.34 On the above issue, the representative of DARE submitted before the Committee:—

> "…..Sir, I would like to say that we have less number of KVKs. At present we have 641 KVKs and our target is to have 751 KVKs. 434 KVKs are under Central and State Universities, 99 KVKs are under NGOs and about 60 KVKs are under ICAR. Cooperation is very much needed to run KVK…."

4.35 On the query of the Committee regarding assistance being provided by KVKs to the farmers, the Department has stated that the

KVKs provide training and advisories to farmers, youth and farm women as per location specific requirements. Limited number of demonstration/ trials on crops, livestock, fisheries and economic enterprises wherein critical inputs are provided by the KVKs. KVKs produce technological inputs like seed, planting materials etc. and provide it to farmers on reasonable prices and Diagnostic facilities like soil and water testing are also offered on reasonable cost.

4.36 On the above issue, the representative of DARE submitted before the Committee:—

> ".....Recently we have discussed regarding KVKs that each University of Agriculture should adopt a village in a block. Our KVK colleagues say that there is one programme coordinator along with six SMS. We will discuss it clearly in the next KVK conference because people do not act according to their commitment. Your suggestions regarding KVKs have been included in the 12th Plan. I would like to inform regarding training that we have trained 67 lakh farmers through KVKs during 11th Plan. Kindly look at the whole farming community. It is about 60 to 65 crore. ...."

4.37 He further added:

> ".....While we are doing it in the frontline demonstration, there are many other agencies.....State Governments should also have the responsibility to provide syllabus, course material and books but it may not be possible to provide training to all the farmers under ICAR system. I humbly submit it, but it is a fact. Farmer to farmer training was discussed. We are trying to bring up this issue of expert groups within the farmers...."

Allocation of Funds

4.38 Under the head KVKs following allocations were made during first three years as against 12th Plan earmarked outlays of Rs. 5739.56 crore:—

(Rs. in crore)

Year	Fund Proposed by DARE	BE	RE	Actual Expenditure
2012-13	734.61	491.67	435.39	410.89
2013-14	760.38	496.88	527.25	499.09
2014-15	1363.34	586.50		
Total	2858.33	1575.05		

4.39 About reasons for upward revision of funds at RE stage during 2013-14, the Department stated that allocation at BE stage during 2013-14 was not adequate to meet the committed expenses like salaries and spill over works. Hence, the upward revision of funds at RE stage was mainly for payment of salaries to the staff of the KVK.

4.40 On scrutiny of allocation, it emerged that only 27.44% (BE) allocations were made during first three years against earmarked outlays for the scheme during 12th plan. When asked to spell reasons for such low allocations, the Department stated that the allocations are decided based on the funds made available at BE stage under Gross Budgetary Support (GBS) provided by the Planning Commission on yearly basis.

4.41 The Secretary, DARE submitted before the Committee:—

"…..Sir, around Rs. 2484 crore were spent for KVK during Eleventh Five Year Plan. We have demanded around Rs. 5800 crore for Twelfth Five Year Plan. This amount will be allocated for KVKs....."

4.42 When asked about average allocation to each KVK, the representative of DARE informed the Committee:—

"…..Sir, it amounts around Rs. 1 crore including salary and all other things. After payment of salary, earlier we used to have less amount in contingency, that was a problem for us. So, it has been increased to Rs. 20 lakh per year in the Twelfth Five Year Plan...."

4.43 On the query regarding activities being performed by KVK with available financial resources, the Secretary of DARE responded as under:

"…..Out of that we provide funds for vehicle inputs etc. to the districts, it may include anything like demonstrations and frontline demonstrations etc. Of course, it was on small scale but there were 10 to 12 such blocks in every district and could not cover them as a whole. There were used to six SMS and one programme coordinator. It has been increase to ten SMS in 12th Plan so that more number of people can come forward. As you told, in view of the losses incurred after harvesting, now a days we have included agronomist etc. We do not say that all our KVKs are well furnished. Even generator is not available at many places.

There is no power and soil testing facility at many places. We have made provisions for minimum processing facility, power, soil testing

and fish hatcheries in 12th Plan. We expect that these works will be completed as soon as we get sanction...."

4.44 On being asked about achievements in various parameters of Agricultural Extension, the Department in their written replies have furnished following details:—

Projected outcome	Process timelines	Achievement			Total
O FT – 4800	April	Activity	2012-13	2013-14	
FLD – 2000,00	2012 to	O FT	29428	33791	63219
	March	FLD	131000	171000	302000
	2014.	Farmers Trained (lakh)	17.38	14.88	32.26
Farmers Trained (lakh) – 30.00		Extension Personnel Trained (lakh)	1.42	1.18	2.6
Extension Personnel trained (lakh) – 2.20		Participation in extension activities (lakh)	170.16	102.41	272.57
		Production of seeds (in tonnes)	17400	15700	33100
Participation in extension activities (lakh) – 240		Planting material (lakh)	117.46	102.53	219.99
		Soil and other samples tested (lakh)	3.78	2.91	6.69
Production of seeds (in tonnes) – 40,000		Mobile advisory (lakh)	11.14	16.28	27.42
Planting material (lakh) – 320					
Soil and other samples tested (lakh) – 280					
Mobile advisory (lakh) – 2.0					

4.45 Regarding the impact of reduced allocations an implementation of scheme, the Department stated that due to reduction in the allocation essential capital expenses like construction, IT, Library Books and Journals,

furniture and fixtures, purchase of equipment and vehicle could not be taken up. The new initiatives envisaged in during the above period were also affected.

4.46 On the above issue, the representative of DARE confessed as under:—

> "…..This is a submission to you all, as you are aware that the main responsibility of Krishi Vigyan Kendra is frontline demonstration or to assess, validate and test the technology being developed in institutions. We would be able to do that, but presently we are taking responsibility for extension of agriculture therefore, we are facing some problems. We need your guidance so that the other extension agencies come together with us. Mr. Chairman, we have agricultural technology Management agency. We have the state government, as we have separate extension centre for horticulture, animal husbandry, fisheries just like agriculture extension centre. There are also too many vacant positions that we face difficulty in bringing synergy. I would also like to tell that whatever responsibility is been given to KVK, to complete that whatever is required, we have tried to do. I understood that we should be doing more.

IARI – Post Office Linkage Extension Model

4.47 The Department has stated that Indian Agricultural Research Institute (IARI) conceived an innovative idea of using the vast network of post offices spread in rural areas and branch post masters in dissemination of improved technologies. The basic idea of IARI—Post Office Linkage Extension Model is capacity building of village post masters so that they work as alternate extension agent and disseminate farm technology information. Seed of improved varieties were sent through postal services to the identified village post masters who in turn distributed the seed to the selected farmers of the villages. The model has been found very effective in dissemination of improved seeds to the farmers of unreached areas, who received the seeds in time. As a result of using the improved varieties of seeds, farmers received 11-30% yield increase. Capacity building of branch post masters benefited the farmers of the areas with enhanced knowledge of crop husbandry. The model was more effective not only in dissemination of low volume high value seeds but also high volume low value seeds. Data on diffusion effect of the model showed extended coverage of improved varieties through

'farmer to farmer' seed sharing. This has been validated at five locations including Sitapur (UP), Buxar (Bihar), Sheopur (MP), Sirohi (Rajasthan) and Jammu (Jammu and Kashmir) for effective dissemination of farm information to the remotely located farmers. The model has been extended to 55 districts covering 14 States in partnership with the KVKs.

Cyber Extension

4.48 Regarding use of IT for spreading information to the farmers, the Department has informed that major emphasis was laid upon ICT-led partnership and community-based extension approaches. Cyber extension centres were established at two villages in Uttar Pradesh for internet-based information flow among the farmers. Mobile based agro-advisory services have also been initiated for the benefit of the farmers.

(B) Directorate of Research on Women in Agriculture

4.49 DRWA including AICRP on Home Science carry out activities on identifying gender issues, testing appropriateness of available farm technology and programmes with women perspective, drudgery reduction, empowerment of farm women, and capacity building of R&D to address gender issues in agriculture. The major activities of DRWA include knowledge sharing through publication of journals and information dissemination through print and electronic media. When asked to furnish details of achievements of Directorate and AICRP home science since 2012-13, the Department informed that gender in agriculture is an emerging area of research being addressed exclusively by DRWA, and there is no overlapping with any project/scheme anywhere. The Institute has demonstrated its leadership in the emerging area of research on women in agriculture. AICRP on Home Science being part of the Institute has been able to guide research in different disciplines of Home Science across the country and has given a new direction to the Home Science teaching which had remained a teaching subject with only student centric research work. Achievements of Directorate and AICRP Home Science are summarised below:—

- A women friendly 'Sitting cum pedalling maize dehusker-sheller' has been developed with an output of 240kg.-300kg./ 5hr/day to reduce the drudgery of farm women.

- Seed development tube (dibbler) has been developed to reduce the drudgery in the form of repetitive strain experienced during seed dibbling activity. The repetitive strain

index which was 6.75 in the conventional method reduced to score of 1.1 with the use of seed placement tube.

- Fish silage has been prepared from fish dressing waste obtained from the local market and the quality of silage has been studied for 180 days. The silage prepared is found to have good keeping quality even after six months of storage at room temperature.

- Media for *in-vitro* multiplication of pointed gourd and pineapple has been standardized and methodology to alleviate *in-vitro* shoot tip necrosis in pointed gourd has been optimized.

- To increase crop productivity and profitability with increased resource use efficiency, a 'resource efficient horticulture model' has been developed and evaluated. In this, a 50 sq. m., low-cost structure could help to earn Rs. 300/sq.m., and take care of the family nutrition.

- Eco-friendly anti-microbial treatment for cotton fabrics has been developed using leaves of Lantana camara, tridax, eucalyptus and tinospora by micro-encapsulation technique.

- Provisional patent has been filed *vide* No. 2667/CHE/2014 on 30th May, 2014 for 'Device to Manage Headload' developed by All India Coordinated Research Project (AICRP) on Home Science, ANGRAU, Hyderabad Centre.

- Capacity Building programmes for farm women, rural adolescent girls and other stake-holders were organized in following areas:—

  — Protected cultivation, Eco-friendly pest management of vegetables, Canopy management etc.

  — Handling of drudgery reducing improved farm implements and tools

  — For entrepreneurial activities (Organic farming, Value addition of fruits and vegetables, Beed work, Soft toy making, Garment designing, Making of utility bags, Hand embroidery stitches, and Tie and dye)

  — To promote Life Skills among girls for enhanced self-confidence, decision making and problem solving.

4.50 It has been stated in Annual Report (2013-14) that All India Coordinated Research Project (AICRP) on Home Science is in operation in ten State Agricultural Universities. The main thrust of the project is on empowerment of rural women for enhancing the quality of life of farm families. It focused on development of gender specific database and training modules for farm women, technology interventions for drudgery reduction in agriculture, nutritional security and health promotion of farm families, promoting vocational skills among adolescent girls, value addition of underutilized natural fibre resources, utilization of degradable and non-degradable farm waste and empowerment of rural women.

4.51 The Department stated that following technological innovations have been made under AICRP on Home Science since 2012-13:—

1. Evaluated Grain spreading tool, tokka, self-sharpening sickle and revolving phiri

2. Tested Grevia optiva fibres with locally available natural dye source

3. Developed pesticide protective clothing

4. Evaluated workstation and work environment for bead making

5. Standardized process for development of mulching material

6. Evaluated VPKAS model and improved motorized thresher

7. Developed five iron rich products namely Pearl pops, Kranky noodles, crunchy ball, Nutrigrans and Nutri Ribbon.

8. Developed a potato digger for uprooting potatoes

9. Potato picker is developed for picking purpose

10. Cotton Plucker is developed for picking of cotton with hands from the field

11. Developed a medium hoe

12. Developed Flower plucking bag for plucking of flowers from the field

13. Harvest baskets using cloth and plastic bins were developed for cotton and vegetable harvesting

14. Developed Dust control bag for flour machine

15. Workstation improvement for Weavers

16. Flour presser for flour mill workers

17. Developed functional clothing for Okra harvesting workers— upper garment, knitted, woven and latex finished gloves

18. Developed and tested two technologies *i.e.* mittens for brinjal and okra harvesting

19. Developed noise and dust controlling mask for agricultural and flour mill worker.

4.52 Regarding efforts made by AICRP to commercialize technology developed by AICRP for wider use, the Department stated as follows:—

- A Scientists,-Manufacturers, Interface was organized at DRWA, Bhubaneswar on 27th August, 2014 to commercialize technology developed by AICRP for wider use. The scientist incharge of AICRP on Home Science, ANGRAU, Hyderabad presented the low cost women friendly technologies developed, designed/refined under AICRP on Home Science that have been field tested and are ready for commercialization. Opportunity was provided to stakeholders to articulate their concerns and share feedback on commercialization of small farm implements and tools for farm women. The interface sensitized the manufacturers towards the need of small farm implements for women. Some manufacturers also showing interest in manufacturing these implements in large scale, thereby ensuring adequate supply and availability of these implements.

- Provisional patent has been filed *vide* No. 2667/CHE/2014 on 30th May, 2014 for 'Device to Manage Head load' developed by All India Coordinated Research Project (AICRP) on Home Science, ANGRAU, Hyderabad Centre.

When asked about proposal for extending AICRP to other State Agricultural Universities, the Department has stated that three new Centres were proposed in the 12th Plan EFC:—

i. Central Agricultural University, Tura, Meghalaya

ii. Tamil Nadu Agricultural University, Madurai, Tamil Nadu

iii. Sardar Krushinagar Dantiwada Agricultural University, Dantiwada, Gujarat

(5) Agricultural Education

4.53 Under the Scheme of "Strengthening and Development of Higher Agricultural Education in India" financial support is extended to the agricultural universities for the various activities such as repair/ renovation/refurbishing of the teaching facilities *viz*. laboratories, classrooms etc. and of infrastructure related to student and faculty amenities *viz*, hostels, maintenance of laboratory equipments, repair, renovation and updating of learning facilities, human resource development; curriculum development and delivery, National Talent Scholarship for meritorious Under Graduate Students, Strengthening of Libraries and e-resources, student contingencies and study tours, personality development, funding for attending seminar, symposium, trainings and creation of niche area of excellence centres and setting up of Experiential Learning Centres, RAWE, Best Teacher Awards, Text Book Writing etc.

4.54 The Department has informed that in the newly created Rani Laxmi Bai University, Bundelkhand University and the Organizational set up and other infrastructural developments are yet to take place. However, the thrust area shall be to impart education in different branches of agriculture and allied sciences as it may deem fit, to further advancement of learning and conducting of research in agricultural and allied sciences. Programmes of extension education in Bundelkhand in the districts of the States under its jurisdiction will also be undertaken. Promotion of partnership and linkages with national and international educational institutions will also be catered to.

4.55 Details of allocations made under the head during first three years are as follows:—

(Rs. in crore)

Year	Fund proposed by DARE	BE	RE	Actual Expenditure
2012-13	768.88	583.00	426.00	513.03
2013-14	797.50	475.00	405.00	359.89
2014-15	949.46	550.00	-	-
Total	2515.84	1608.00		

4.56 When asked about reasons for allocations of only 40.2% (BE) for the first three years of plan period under the head against 12th Plan

allocations, the Department have stated that the allocations are decided based on the funds made available at BE stage under Gross Budgetary Support (GBS) provided by the Planning Commission on yearly basis. When asked to explain steep cut of 26.92% and 14.73% in allocations at RE stage during 2012-2013 and 2013-14 respectively, the Department have stated that the budget allocation under RE was reduced further due to additional cut by the Government of India.

4.57 The Department while explaining the impact of lower allocations for Agricultural Universities stated that some proposed programmes under higher agricultural education and R&D could not be implemented effectively as planned.

(6) National Fund for basic, Strategic and Frontier Application Research in Agriculture

4.58 NFBSFARA is a platform for developing scientific capacity, partnership (beyond the traditional NARS) and culture, and is providing support for basic and strategic research as a source of continuous flow of knowledge required for solving agricultural problems of present and of future. NFBSFARA undertook four major tasks—selection and awarding new projects; monitoring ongoing projects; creating awareness for the need and nature of the basic research for agriculture among institutions within and outside traditional NARS; and assisting scientists in developing meaningful winning projects. The Department in their Annual Report (2013-14) stated that twenty five projects with a total budget of Rs. 50 crore were initiated. According to the outcome budget (2013-14) ICAR has approved 59 projects in the thurst areas identified for the 12th Plan period.

4.59 It has been observed that amount of Rs. 500 crore is earmarked for the scheme during XII Plan. Allocation and actual expenditure during first three fiscal years are as follows:—

(Rs. in crore)

Year	Fund proposed by DARE	BE	RE	Actual Expenditure
2012-13	85.26	80.00	55.00	36.73
2013-14	100.00	75.00	110.00	89.29
2014-15	121.12	121.00	-	-
Total	306.38	276.00		

4.60 When asked about reasons for actual expenditure being only 81% and 65% RE during 2012-13 and 2013-14, respectively, the Department

have stated that actual expenditure was less because a large amount of fund was released towards end of the financial year. Hence, the expenditure by different funded centres were made accordingly.

4.61 On the query regarding reasons behind enhancement of allocation under the scheme at RE stage during 2013-14, the Department stated that during the year 2013-14, a total of Rs. 110.00 crores was sanctioned under RE. Out of this Rs. 51.45 crores were released for the ongoing projects and Rs. 41.39 crores was sanctioned for the award of 21 projects. A sum of Rs. 92.77 lakhs were spent for the NFBSFARA (renamed as NASF) secretariat.

4.62 The Department further furnished the following details:—

(Rs. in lakhs)

Year	Allocation	Expenditure
2006-07	235.00	235.00
2007-08	1050.50	1050.50
2008-09	253.00	208.37
2009-10	277.23	277.23
2010-11	335.00	203.64
2011-12	380.57	379.85

4.63 The Department further stated that since 2006-07, 97 basic and strategic research projects have been sanctioned and put to implementation at a total outlay of about Rs. 280 crores. Out of the 97 sanctioned projects 75 are on-going at this point of time.

4.64 The Department have stated that well planned transparent, rigorous and open competitive funding system has been established in which a large number of research institutions of the country have been brought into the fold for solving a set of strategic research problems identified through wide consultations. Since the initiation of the scheme four calls for projects have been made which are given as Call I (made in 2006), Call II (made in 2010), Call III (made in 2011), and Call IV (made in 2012). The selection of projects is a two-stage process. In the first stage Concept Notes are submitted online and on the basis of the selected Concept Notes full proposals are submitted. The percentage of Concept Notes received for Call II onwards, from various institutions in the National Agricultural Research System (NARS) and non-NARS system given below reflects the trend of healthy development in participation from non-NARS organizations.

Concept Notes submitted by NARS and non-NARS institutions:—

Call II: 74% NARS (47% ICAR, 27% SAU); 26% Non-NARS
Call III: 75% NARS (43% ICAR, 32 % SAU); 25% Non-NARS
Call IV: 78% NARS (41% ICAR, 37% SAU); 22% Non-NARS.

4.65 The Department has also stated that in the approved projects, so far 66 NARS and 28 non-NARS institutes have participated (after taking in account the cases where one institute has participated in more than one project). A good participation of non-NARS institutions (*i.e.* about 30%) is also reflected. Thus the participation of non-NARS institutions in the approved projects as leaders has been 14%-23% and as partners, 26%-34%.

4.66 The Department have informed that in the process of development of projects NFBSFARA took special initiative in inculcating the idea and importance of basic and strategic research in the relevant areas and in assisting the project proponents in developing meaningful and winning projects. In that process the National Co-coordinator regularly participated in the training courses and lectures conducted by the National Academy of Agricultural Research Management (NAARM), Hyderabad for the newly recruited trainees at the entry and the middle levels and the training courses held under the auspices of the NAIP. Further, all the proponents of selected Concept Note were directly guided in developing winning projects through workshops at NAARM. Those who approached NFBSFARA for guidance even before submitting the Concept Notes were provided sufficient assistance in developing the Concept Notes.

4.67 Explaining achievement in the area of Capacity Building, the Department have stated that as the selection has been rigorous the number of projects that ultimately got approved has remained about 3-5% but projects have been approved in most of the strategic priority areas. However, the worry has been that in many areas no projects could be approved. Hence, as a part of capacity building for basic and strategic research a large number of awareness programmes will be organized in the country to increase the success rate from 3-5% to about 8-10%. About Rs. 71.0 crores has been spent so far (about 60% of the total budget) for developing additional equipments/facilities distributed in the country in laboratories in both NARS and non-NARS institutions. A National Phenomics Facility costing about Rs. 32.0 crores has been budgeted under the project to help in conducting cutting-edge genomics research for agriculture in general and plant science in particular.

(7) National Agricultural Innovation Projects (NAIPs)

4.68 The National Agricultural Innovation Projects (NAIPs), effective since September 2006, is the initiative of the Indian Council of Agricultural Research (ICAR), funded jointly by the Government of India and the World Bank to broadly identify and promote technology – led innovations in agriculture sector. The project aims to enhance multi-dimensional competence for steering-up agriculture R&D. The Department have informed that the 13th Institutional Support Mission of the World Bank (ISM 13; 12-20 August, 2013) has reconfirmed that the competitive consortia based funding through the NAIP has introduced a pragmatic pluralism in the NARS. A total of 171 public-private partnerships have been established in 203 sub-projects, approved with the NAIP financing, including 3 sub-projects with the additional financing from the Global Environment Facility (GEF).

4.69 It has also been stated that promising results emerging from the NAIP research and development activities as determined by select key performance indicators include, 118 patent/intellectual property protection application filed; 542 research papers published in the high impact peer reviewed journals; 82 technologies/products commercialized based on the NAIP research; 57 new rural industries piloted, and over 8371 hectares of farmers agricultural land brought under sustainable land-management practices.

4.70 When asked to furnish details of financial allocation and actual expenditure under the scheme since its inception, the Department submitted following details:—

(Rs. in crore)

Financial Year	Revised Estimates	Actual Expenditure reported to the World Bank after Audit certification	Remarks
2006-07	0.00		Expenditure certified by Auditors. Accepted by the World Bank.
2007-08	51.870	26.618	
2008-09	257.000	134.424	
2009-10	270.730	256.510	
2010-11	270.000	255.018	
2011-12	176.000	175.85	
2012-13	150.000	158.079	
2013-14	235.000	251.310	Expenditure reported as per IUFR. The audit certification is under process.
2014-15	109.000	91.88	

4.71 Allocations under this head during first three years against earmarked outlays of Rs. 500 crore for 12th Plan are as follows:—

(Rs. in crore)

Year	Fund proposed by DARE	BE	RE	Actual Expenditure
2012-13	130.87	131.00	150.00	150.74
2013-14	399.39	400.00	235.00	255.55
2014-15	345.00	109.00		
Total	875.26	640.00		

4.72 On scrutiny of above details, it has been observed that allocation of Rs. 640 crore (BE) were already made under the head as against earmarked outlays of Rs. 500 crore for XIIth Plan under the scheme. It has been observed that actual expenditure was even more than RE allocation during 2012-13 as well as 2013-14. When asked about reasons for actual expenditure exceeding earmarked outlays during 12th Plan, the Department has stated that there has been slight excess of actual expenditure *vis-à-vis* the Revised Estimates during FY 2012-13. This was mainly because the stipulation of the World Bank guidelines for the partners to utilize the unspent balance under recurring sub-heads of the budget of the previous years. However, due to cut in RE, at times, sanctions under various sub-projects were more than the actual release and in cases of necessity of work, wages of contractual staff etc., some consortia made expenditure from its own resources which were later reimbursed.

4.73 The Department has also submitted that during FY 2013-14 ICAR sanctioned Budget Estimates (BE) of Rs. 400.00 crore. Thereafter, NAIP received a remittance of Rs. 300.00 crore from ICAR in different phases from April, 2013 to November, 2013. Accordingly, Project Implementation Unit of NAIP released Rs. 300.00 crores to its 365 Partners. However, during huge budgetary cut under Plan, the Revised Estimates (RE FY 2013-14) of NAIP was reduced to Rs. 235.00 crore. Thereafter, a massive exercise was taken up by PIU of NAIP to get back the excess Rs. 65.00 crore from various partners. The partners of NAIP could refund only Rs. 50.00 crore by deferring the payments for procurement on the assurance given by PIU-NAIP that the corresponding funds could be made available in FY 2014-15. The partners could not refund the balance Rs. 15.00 crore approximately as the expenditure was already incurred by them before the budgetary cut was made. This was the main reason of excess expenditure *vis-à-vis* RE during FY 2013-14. The World Bank and DEA of Ministry of Finance stipulate quarterly disbursement targets

of the World Bank Credit. Hence, during the extended phase of NAIP, the disbursement targets *i.e.* expenditure was to be made at a faster pace in order to adhere to the above target. PIU-NAIP has already achieved the full disbursement target of 200 m USD of the World Bank Credit before the closure of the Project *i.e.* on June 30, 2014.

(8) Agroinnovate India Ltd.

4.74 Agroinnovate India Ltd. is a registered company under the Companies Act, 1956 fully owned by Government of India in the Department of Agricultural Research and Education (DARE) with a share capital of Rs. 100 crore and initial paid up capital of Rs. 50 crore. The Company endeavors to work on the strengths of DARE's Indian Council of Agricultural Research (ICAR) to promote spread of R&D outcomes through IPR protection, commercialization and forging partnerships both in the country and outside. It is DARE/ICAR owned PSU company working towards promotion and commercialization of ICAR technologies, and licensed the technology of tissue culture of oil palm and related knowhow for commercialization. To augment the availability of FMD vaccine, Agroinnovate has initiated the establishment of a modern vaccine production plant (capacity 100-150 million doses) in PPP mode at Bengaluru campus of IVRI, Izatnagar. The company is also assisting DARE on projects related to establishment of facilities for soil, water and tissue testing, seed production and demonstration, and Farm Science Centres in different countries in Africa.

4.75 When asked to furnish details of revenue generation of AIL for last three years, the Department have stated that Company has generated revenue by licensing of Tissue Culture Technology of Oil Palm and through various Capacity Building programs. Revenue generated by AIL during since 2011 is as follows:—

Year	2011-12 (*i.e.* 19/10/2011-31/03/2012)	2012-13	2013-14
Revenue from Operation	Nil	Nil	1,26,34,405
Other Income (Interest Income)	Nil	4,20,29,587	4,86,03,630

4.76 When asked about dividend income given by AIL to the Government of India during 2012-13 and 2013-14, the Department have stated that major source of income for the Company being Interest Income, the Company has not declared any dividend to Government of India during 2012-13 and 2013-14.

PART II

RECOMMENDATIONS/OBSERVATIONS OF THE COMMITTEE

1. The Committee take note that the Rule 331G of the Rules of Procedure and Conduct of Business in Lok Sabha relating to examination of Demands for Grants by the Departmentally Related Standing Committees (DRSCs) was suspended by Hon'ble Speaker, Lok Sabha to enable the House to pass the Demands for Grants for the year 2009-10 during the Second Session of Sixteenth Lok Sabha without the same being referred to the concerned DRSCs. The Demands were, however, referred to the Standing Committees for examining the same after their constitution and for presenting the Report to the House therein. The Committee, after their constitution on 1st September, 2014 took up examination of the Demands for Grants pertaining to the Ministry of Agriculture for the year 2014-15. Since the Budget for the year 2014-15 has already been passed by the Parliament, the Committee endorse the same. The Committee would however, like the Ministry to take note of their recommendation while implementing various programmes/schemes, etc. within the approved budget.

AVAILABILITY OF FUNDS TO THE DARE

2. The DARE/ICAR has been entrusted with the onerous responsibility of spearheading the Research and Development in Agriculture and allied sectors including education and extension activities. Research and Development, agricultural innovations and diffusion of new technologies are significant so as to meet the country's quest for food and nutritional security while enhancing the income and employment. However, the Committee note that ICAR has not been provided adequate funds as per outlays approved for 12th Plan. The Committee note that during first three years, the ICAR has been provided only 40.5% of funds of approved outlays of Rs. 25553 crore. The Committee are not satisfied with the reasons that allocations to DARE has been reduced keeping in view the total available resources in the country and demands of various other Ministries/sectors like infrastructure for education, health, sanitation etc. The Committee are apprised that every rupee invested in Agriculture Sector would fetch

a return of Rs. 13.5. The Committee are of the view that Research and Development for agriculture and allied sectors should be accorded utmost priority with adequate funds. This is necessary for development of expertise necessary for making Indian agriculture ready to face challenges associated with increasing population, changing trends in consumption, deteriorating soil health, depleting resources, state of small and marginal farmers and climate change. The Committee, therefore, urge the Ministry of Finance and Planning Commission to enhance allocation to the Department/ICAR matching the original outlay in the remaining years of XII plan to meet the aforesaid challenges facing the Agriculture Sector.

3. The Committee note that Agriculture in India accounts for over 14% GDP and 12% of country's exports providing employment to over 50% of the work force. The Committee find that 50% of the workforce of the country contributes only 14% in the GDP of the country. In order to improve agricultural productivity, the Committee in their earlier reports have time and again stressed emphatically about the need for earmarking fund to the tune of at least 1% of agriculture GDP for R&D in agriculture. However, the Government is yet to take effective steps in that direction. The Committee are apprised that wherever there has been growth in Agricultural Research, Agricultural Education or Agricultural Growth in the world, there at least 2% of their total GDP. The Committee note that allocation during the first three years to the DARE/ICAR were only 0.59% of total allocation of Plan Budget as against approved outlay of 0.70% for XII Plan. The Committee are of the considered view that as already stated curtailment in allocation for the R&D work in agriculture will adversely affect the preparedness of the country to face challenges posed by the phenomenon of climate change and may jeoparadise food security of the country. The Committee, therefore, strongly recommend that the Department should approach the Planning Commission and Ministry of Finance to enhance the share of DARE to at least 1% of GDP keeping in view the significance of R&D in Agriculture Sector particularly in relation to sustainable economic development and export earnings of the country.

IMPLEMENTATION OF INITIATIVES ANNOUNCED FOR XII PLAN

4. The Committee are unhappy to note that many new initiatives such as Rural Entrepreneurship Awareness Development Yojana (READY), farmers First, Attracting and Retaining Youth in Agriculture (ARYA), establishment of Central Agricultural Universities at Bihar, Bundelkhand and Barapani initiated for implementation during

12th Plan are yet to commence nearly three years after the commencement of the Plan. The Committee have been informed that the pace of progress of these initiatives has been affected due to reduced allocations to the DARE. They have been informed that the proposal relating to some initiatives such as READY and ARYA are pending before the Ministry of Finance and CCEA respectively. The Committee have been assured that these proposals will be implemented soon after getting the approvals. Similarly, formalities for establishment of CAU Bihar and Barapani have been initiated. The Committee deplore the slow pace of work in implementation of new initiatives during the XII Plan. The Committee are of the view that preliminary work for implementation of these schemes and the proposals for approval should have been completed well in time. The Committee desired that requisite formalities for launching these schemes/projects should be completed without further loss of time and it should be ensured that implementation is taken up during the current financial year so that intended benefits planned under these schemes are available in time.

SEPARATE FUNDS FOR SCHEMES/INITIATIVES ANNOUNCED IN BUDGET SPEECH

5. The Committee note that no separate grants were provided to DARE for implementation of schemes announced in Budget Speech during 2012-13 and 2013-14. They also observe that Rs. 100 crore which were provided by the Planning Commission to DARE in 2014-15 for establishment of Fund for Climate Change were diverted to the Deptt. of Agriculture and co-operation and the Ministry of Environment and Forests (MoEF) by the Ministry of Finance. The Committee have been informed that the Ministry of Finance has again sent a clarification on 29th September, 2014 that this budget para belongs to both the Ministries i.e; MoEF and DARE. The Committee are concerned with the state of affairs. They wonder why this confusion about demarcation has arisen. Now that the position has been clarified by the Ministry of Finance, there should be no delay in establishment of the fund and its fruitful utilization. The Committee would like to be apprised of the progress and achievement in this regard.

REVENUE RECEIPT OF DARE/ICAR

6. The Committee note that ICAR has its own internal source of revenue such as income from sale of farm produce/livestock, consultancy services, training, Fee/subscriptions, royalty, publications etc. They have been informed that ICAR has generated revenue of Rs. 50.69 crore and

Rs. 53.06 crore during 2012-13 and 2013-14 respectively. In addition to this, revenue of Rs. 5.61 crore and Rs. 4.65 crore were generated from consultancy services undertaken during 2012-13 and 2013-14 and Rs. 9.64 crore generated from Business Process Development Units of various ICAR institutes as technology license fee during 2011-12 to 2013-14. The Committee have also been informed that overall target for revenue generation has been increased to Rs. 109.60 crore for 2014-15 *vis-à-vis* Rs. 53.06 crore achieved during 2013-14. They are of the view that ICAR with its huge scientific manpower and available knowledge base in terms of Intellectual Property Rights (IPRs) has tremendous potential for enhanced revenue generation. They recommend that ICAR while encouraging their scientists to create knowledge base regarding innovative seeds varieties, agricultural implements etc. which can cater to the domestic demand as well as for global application, should market their products/ knowledge/ research in international market so that revenue generation may be enhanced many folds. The Committee desire ICAR to take steps to tap business opportunities available in domestic and global markets.

7. The Committee note that revenue generated by the institutes under ICAR are not reflected in Revenue Receipt presented to the Lok Sabha. They have been apprised that revenue generated from consultancy services and training are utilized as per approval given by the Ministry of Finance and that license fee generated by the institutes is remitted to the ICAR as per ICAR Guidelines. The Committee are given to understand that all revenues received by the Government by way of taxes like Income Tax, Central Excise, Customs and other receipts flowing to the Government in connection with the conduct of Government business *i.e.* Non-Tax Revenues are credited into the Consolidated Fund constituted under Article 266 (1) of the Constitution of India. The Committee, therefore, find violation of this provision of the Constitution as any money deposited to the Consolidated Fund of India ought to have the approval of Parliament for incurring expenditure. They desire that such revenue generated under the administrative control of the Department should be reflected in the budget documents including detailed Demands for Grants. They would like DARE to clarify the issue and rectify the irregularity, if any, in this regard.

CHALLENGES BEFORE INDIAN FARMING DUE TO CLIMATE CHANGE

8. The Committee have been informed that predictions made by ICAR using indigenous simulation models have shown that climate

change is likely to reduce wheat fields by 6 to 17% by 2020 (2011-2040), 13-29% in 2050, (2041-2070) and 15-25% in 2080 (2071-2100). They note that mega project National Initiative for Climate Resilient Agriculture (NICRA) has been instituted in 2011 to enhance resilience of Indian agriculture to climate change and climate variability through Strategic Research, Technology Demonstration, Capacity Building and Sponsored/ Competitive Grant Projects. The Committee have been apprised that 130 model villages have been established in climate vulnerable 130 districts under this project and several climate resilient interventions like water harvesting, direct seeded rice, system of rice intensification, alternate wetting and drying, green manuring, deep placement of fertilizers and feed supplements for livestock have been demonstrated on farmers fields with a target of expanding these practices horizontally to other districts. The Committee note that zero tillage in wheat, summer in rice wheat system, green and brown manuring, mulching, protected cultivation of vegetables, drip irrigation, bio-fertilizers, raised bed planting are being promoted through capacity building interventions and technological back stopping with demonstrations under satellite village programme. However, the Committee have been informed that some other activities planned to address impact of impending climate change were affected due to reduced fund allocation and subsequent cut at RE stage. They are of view that R&D for development of new crop varieties and practical strategies including introducing relevant technology through satellite village programme are going to be corner stone of resilience in agriculture to face challenges associated with climate change. They are of the opinion that proactive steps taken in this direction will help the country to lead the world in the scientific innovations. The Committee, therefore, recommend the Government to allocate adequate funds so that Planned R&D in the area of preparedness for facing challenges that climate change will pose to Indian agriculture are not hampered. They also recommend that experiments in the 130 model districts be carried out in time and after assessing the results of these experiments it could be extended to other climate vulnerable districts in India. They also emphasize that in order to manage impact of climate change and enhance farmers income, relevant technology of IARI be introduced through satellite village programme on wider scale. This would bring awareness with multiplier effect as these villages work as light house of IARI technologies even in the neighbouring areas. Further, every KVK may adopt a model village within their jurisdiction, where the climate resilient technology could be experimented.

IMPLEMENTATION OF DISTRICT CONTINGENCY PLAN

9. The Committee note that farmers are increasingly facing problems of loss of crops and livelihood due to fluctuation in weather condition such as drought and heat stress caused by the factors associated with climate change. They note that District level vulnerability atlas was prepared by ICAR to develop and target appropriate adaptation measures to regions that are more vulnerable and affected by climate change. They were also apprised that District contingency plan developed by the ICAR in coordination with the State Government were implemented in current year and has been found very useful. The Committee are of that view that preparation of District Contingency plan was a long pending requirement and it will go a long way in solving problems faced by the farmers in the country. However, the ICAR should further improve the contingency plans on the basis of feedback received during implementation. The Committee, therefore, recommend the DARE to further fine-tune District Contingency Plans in keeping the difficulties/suggestions during the implementation of this plan. The Committee also recommend the Department to start awareness campaign to educate farmers about contingency plan through print and electronic media as well as through network of KVKs. Further, they desire that Agritech and Agri Business firms be also involved in the process.

PREVENTION OF SOIL EROSION

10. The Committee are aware that soil erosion due to natural reasons, urbanisation and industrialization directly affects the crops as the fertile upper layer of the soil is eroded. Degradation of soil especially soil erosion is major challenge being faced by the farmers and planners in the country. They note that large part of Punjab is affected from the problem of soil erosion. They have noted that Government of Punjab is addressing the problem of erosion in the state through integrated watershed management programmes. The Committee have also been informed that State Government and Department of Land Resources, Government of India is implementing 6 IWMP projects for 17 Micro watershed projects in affected areas. They are of view that there is need to spread vital information relating to good agricultural practices and involvement of farmers in order to reclaim the degraded land. They are of the opinion that there is urgent need of preparation of soil erosion map at larger scale covering entire country in order to assess the enormity of problem and devise suitable

action plan in the affected areas. The Committee, therefore, recommend the DARE to prepare soil erosion map of entire country at 1:250,000 scale and devise location specific plan to control the problem of soil erosion. The KVKs should also be instructed to spread the information about good farming practices in the country in order to educate farmers on soil erosion and soil degradation.

ESTABLISHMENT OF SOIL TESTING LABS

11. Availability of information regarding soil quality is necessary input so that farmers are able to take decision on type of crops to be grown and type and quantity of fertilizer to be used. The Committee note that 390 soil testing labs have been established at Krishi Vigyan Kendra and there is plan for establishment of 150 soil testing labs during 12th plan. They have also been apprised about problems being faced by KVKs to analyse large volumes of soil. The Committee are of view that existing soil testing labs and those planned for are inadequate in both numbers and facilities to cater to the needs of farmers in large part of the country. In keeping with the vast coverage required besides conducting tests at regular intervals, there is need to promote private participation for establishment of soil testing lab. The Committee, therefore, recommend the DARE to make efforts in consultation with Department of Agriculture and Co-operation and State Governments for establishment of soil testing labs at Panchayat level. The Committee also advise the Department to involve private sector in establishment of soil testing labs and deploy local educated youths including Agro Business and Agritech firms in order to enhance the penetration of these labs to every nook and corner of the country.

PROMOTION OF DIGITAL SOIL TEST FERTILIZER RECOMMENDATION METER (STFRM) DEVELOPED BY IARI

12. The Committee are aware that unbalanced and indiscriminate use of chemicals/plant nutrients over the years has resulted in depletion soil fertility and multi nutrient deficiency especially the soil under intensive cropping. The rampant use of fertilizers has not only affected the soil health but also had led in the escalation in the cost of cultivation. They feel that this is mainly due to the ignorance on the part of the farmers about the quality of soil *vis-à-vis* the crop to be sown. The Committee find that ICAR has developed a Digital Soil Test Fertilizer Recommendation Meter (STFRM) and a programmable low cost digital

equipment that brings soil testing at farmer's doorsteps. They were apprised that this equipment can quantitatively estimate 5 soil parameters namely PH, EC, Organic Carbon, Available P and Available K and prescribe fertilizer recommended on the basis of targeted yield approach. During study visit to IARI, Delhi, the Committee have been informed about low cost soil testing machine developed by IARI. The Committee are of the opinion that use of this technology is best suited for use by small and marginal farmers through the village panchayats for on the spot soil testing besides giving an opportunity of employment to rural local youth. They however, find that this technological adaptation is still at the laboratory level. The Committee recommend that the STFR meter for soil testing based fertilizer recommendation should be widely used through the panchayats for on the spot soil testing and the recommendation for balanced and integrated use of fertilizer. They however, caution the Department that Companies may escalate the prices of these Meters at the time of large scale commercial production and marketing of the meters to the farmers. They, therefore, recommend that the Department should incorporate a binding clause at the time of transfer of technology for commercial production against hike in the price of the 'Meters for soil testing on the spot'.

DEVELOPMENT OF NUTRIENT FORTIFIED CEREALS

13. The Committee note that as per a study made by ICAR malnutrition/undernutrition is not only faced by the poor but also by more than 50% of middle income and more than 30% of upper income household as they are consuming lower than required dietary energy. They have been informed that ICAR has developed many crop varieties of rice, wheat, maize etc. with enhanced micro-nutrients/nutrient fortified cereals. They have been apprised that in order to address micro-nutrient deficiencies among rural families 510 nutritional gardens were established in 45 adopted villages in 9 States. During the year 2013-14 demonstration a millet crop including barnyard millet, singer millet, proso millet and pearl millet were laid out to sensitise the farmers. They also note that ICAR institutes have developed many products such as upma mix, pasta mix, halwa mix etc. using ingredients of pearl millet, Barley, sorghum and sawai millet. The Committee have also been apprised about partnership with fast moving consumer companies to popularize and encourage use of these products. They also note that DARE provides technological support to a programme on Nutri Farms being conducted by DAC in selection of bio-fortified food crops enriched with micro nutrients. The Committee have been

informed that an ICAR-ICMR collaborative research project entitled "Health foods from agricultural, livestock and aquatic produce" to generate output in terms of functional food products and nutraceuticals to combat malnutrition and lifestyle diseases proposed for 12th Plan will be initiated as soon as funds are available. The Committee note the efforts made by ICAR to develop nutrient fortified crop varieties and fast food varieties based on Barley, sorghum etc. However, they are of view that the reach is too meager and there is need for initiating a mass scale awareness campaign to spread the benefit of these products. The Committee also recommend the Department to make adequate efforts to get additional funds to start ICAR.

ICMR collaborative research project on "Health foods from agricultural, livestock and aquatic produce" at the earliest. They also recommend to the Department to devise a Campaign strategy in consultation with relevant Ministries of Central Government to publicise the nutrient fortified crops. They desire the Ministry to establish more Nutrition gardens and cover more States to address Micro nutrient deficiency.

ACTION PLAN TO CONTROL ARSENIC CONTAMINATION OF GROUND WATER IN WEST BENGAL

14. The Committee note that more than 3 crore people in 34,000 square km. area in the State of in West Bengal are prone to chronic arsenic toxicity due to contamination of ground water and high build of arsenic in soil and thereby its subsequent accumulation in crops and vegetables. They have been apprised that ICAR has come up with some practical mitigation strategy such as sowing of low arsenic accumulating rice varieties, use of organic manure, provision for irrigation from deep tubewell, sowing of legume and pulses requiring reduced irrigation etc. to control the harmful effect of arsenic contamination. The Committee urge the Department/ICAR to take steps for widespread dissemination of these strategies to local population in affected areas. At the same time, there is urgent need for taking up this issue on priority basis and granting funds for the task as it directly affects the human and livestock health. The Committee, therefore, recommend the ICAR to prepare an action plan to mitigate the harmful effects of arsenic contamination in consultation with Department of Agriculture and Cooperation, Ministry of Health and Family Welfare, Ministry of Science and Technology, Ministry of Human Resource Development, Ministry of Environment and Forests and Government of West Bengal.

NATIONAL ACTION PLAN TO CONTROL THE MENACE OF PARTHENIUM GRASS

15. The Committee note that problem of unabated growth of 'parthenium' in large parts of the Country is affecting availability of fodder for cattle, thereby directly affecting the health of livestock/cattle as also income of farmers. They note that mechanical, chemical and biological methods are available for management of growth of parthenium grass. The Committee have been apprised that Directorate of Weed Science Research (WSR) has developed a cheap technology for mass multiplication of a bio agent called 'zygogramma bicolorata' which helps to lower down the impact of parthenium and the Weed Science Research has made efforts to spread awareness about practices to control spread of parthenium. They have also been informed about need of large scale efforts on the analogy of 'Swachh Bharat Abhiyaan' to control the menace of parthenium grass. The Committee, therefore, recommend to the Government to frame a concrete action plan to spread awareness about the technology on a country wide scale to control the unabated growth of parthenium and other exotic weeds affecting availability of fodders to the cattle. The Committee, strongly, recommend the DARE to frame a co-ordinated action plan in this regard in consultation with DAC and Ministry of Rural Development under intimation to the Committee of the outcome. The Committee also recommend that the Department should find out feasibility of using the method of spraying the salt water on parthanium.

The Committee urge the Department to probe the possibility of relating and integrating this action plan to control parthenium and the use of bio-agent to control on the road sides which are left unattended with 'Mahatma Gandhi National Rural Employment Guarantee Act' Schemes by involving the unemployed labour in using the technology for the same. They also emphasize that awareness should be enhanced for proper results.

AVAILABILITY OF ADVANCE PRICE FORECAST OF AGRICULTURAL COMMODITY

16. The Committee are of the opinion that availability of advance price forecast before sowing of crops could be very beneficial to the farmers in pre-sowing decision making and thereby enhancing farmers' income. The Committee note that ICAR is providing facility of price forecast for twenty agricultural commodity through network of

16 centres located throughout the country. The Committee note the efforts of ICAR in the important area of agricultural extension. However, the Committee are of view that there is need for bringing more crops especially the major crops region-wise under their purview in order to cover larger number of farmers in other parts of the country as well. The Committee, therefore, recommend the DARE to enhance the coverage of agricultural commodity along with number of centres providing price forecast for the benefit of farmers especially the small and marginal farmers in the pre sowing decision making.

PROMOTION OF TECHNOLOGY OF SEWAGE WATER TREATMENT DEVELOPED BY ICAR

17. The Committee are aware that the unplanned application of raw waste water is increasing the risk of agricultural sustainability and consumer/environment health basically due to lack of proper treatment facilities and awareness. They are of the view that agricultural reuse of waste water, under fresh water scarcity, is essential in today's agriculture scenario not only because it meets the water demand and waste water disposal but also it enhances fertilizer security of the resources of the poor farmers. The Committee note with satisfaction that IARI has taken the first step in their Delhi Campus and has evolved an innovative and eco-friendly waste water treatment facility where it utilizes emergent wet land plants (s.a. Typha Latifolia) local media and native micro organisms, present in natural waste water for treating 2.2 million litres/day of sewage water. Within one and half year of its commencement it has been revealed the performance of the plant *w.r.t.* Turbidity (99%), Nitrate (95%), Phosphate (90%), Lead (81%), Iron (99%) and other pollutants normally present in local municipal waste waters. They have been apprised that the technology used in this waste water treatment system is associated with just 1% energy requirement of the conventional system; zero chemical application, zero-sludge generation, 50-60% reduced treatment cost and no skilled requirement. The Committee note the multifarious advantages of the above eco-friendly and economic initiative *vis-à-vis* conventional water processing system and feel that this technology needs to be promoted extensively. They, however, find that this initiative is in its nascent stage. The Committee, therefore, strongly recommend that the Department/ICAR should interact with State Governments/MCD and educate them on the advantage on this eco-friendly, low cost waste water treatment method of waste water disposal which can be reused in agriculture especially where there is fresh water scarcity. The benefit of zero-sludge and

other pollutants through this process, which has became an increasing menace in municipalities could also be highlighted to them. The Committee urge the Department/ICAR to take up the matter with concerned Ministries/Departments/State Governments/municipalities to adopt this system expeditiously for their all round benefits. DARE/ ICAR should through their network and linkages with SAUs approach the State Governments/Municipalities urgently.

CREATION OF SYSTEM OF NATIONAL CROP PLANNING

18. The Committee find that the Crop Science Division have released 106 improved varieties/hybrids of different crops including 70 cereals, 15 oilseeds, 8 pulses, 3 fibre crops, 4 forage crops and 6 sugarcane during 2013-14. The Committee are, however, concerned about the release of these crops and its reach to the small and marginal farmers. Further, they are also aware that small farmers are mostly not aware of the prices for the crop till the harvest time. In the process, at times, lots of post harvest losses take place affecting the financial health of these farmers. The Committee feel that the Department should guide the small and marginal farmers about planning the crops depending on the region, fertility of soil, congenial crop varieties and prices forecasts (depending on the market forces in the country). The Committee, therefore, desire that the Government should make a serious effort by carrying out a systematic and objective national crop planning alongwith crop planning for small and marginal farmers.

FIXATION OF PRICES OF SEEDS DEVELOPED BY ICAR

19. The Committee note that DARE along with other stakeholders is involved in fixing prices for Breeder Seed and Sale Rate is fixed keeping in view the production cost and considering the interest of the farming community. They have further been informed that price of foundation and certified seed is decided by respective seed producing public agencies like NSC and respective State seed corporations, private seed companies as per the prevailing market rates and cost of production. The Committee are of view that adequate availability of seeds of good quality at reasonable price to farmers is of utmost significance for enhancing production and productivity of farm produce. Further, outcome of R&D work with public money should be available at reasonable prices to the intended beneficiaries. They find the current practice of leaving fixation of final prices of seed varieties to the private sector works, at times, against the interest of the farmers. The Committee

recommend that ICAR should develop a seed bank where all varieties of seeds are available to the farmers, that is traditional seeds, newly researched seeds, hybrid seeds etc. R&D for upgraded traditional seeds with quality improvements and increased productivity should be developed by ICAR proactively. They also recommend the DARE to devise a policy for fixation of final reasonable prices of seed varieties developed by ICAR at the time of transfer of technology which are fair and within the reach of majority of small and marginal farmers in the country. Seed varieties developed by ICAR should be sold with such preconditioned appropriate clause that the farmers receive them at reasonable price. Adequate monitoring mechanism should be put in place for the purpose.

DEVELOPMENT OF NEW DROUGHT RESISTANT SEED VARIETIES

20. The Committee note that development and availability of drought resistance seed varieties are required by farmers in large part of the country facing problem of eratic monsoon. The Committee note that 65 varieties of drought resistant varieties of rice, wheat, Barley, sorghum, maize, horse gram etc., were developed by Crop science division of ICAR during the last five years. They also note that 100 promising genotypes of wheat, rice, maize and pulses were identified for drought, heat and flood tolerance under the National Initiative on Climate Resilient Agriculture (NICRA). The Committee are, however, of the view that there is need for further research work for development of new varieties of crops with use of genotypes identified under NICRA. The Committee, therefore, recommend the DARE to fast track the R&D work under the NICRA so that new and better drought resistant seed varieties are made available to the farmers in the affected areas.

HORTICULTURE SCIENCES

21. The Committee are aware that horticulture is a crucial component of the agriculture which is the mainstay of the Indian economy by virtue of India being bestowed with diverse agro-climatic zones and regional crop variation. The Committee were apprised that with R&D network across the country, horticulture is changing rapidly in terms of production and productivity. The horticulture production is 2.68 million tonnes during 2012-13 and it contributes approximately 30.4% of agricultural GDP. The Committee find that Rs. 422 crore were allocated for horticulture sector for the Twelfth Five Year Plan. However, they are unhappy to note that only 45% (BE) *i.e.* only Rs. 650 crore have

been allocated during the first three years of the Twelfth Plan. Furthermore, the allocation comes to only 20.6% (Rs. 294 crore) for the first two years of the Twelfth Plan. The Committee note that the growth in exports of fresh fruits and vegetables is 14% while it is 16.2% in case of processed food and vegetables. The Committee are aware that the growth in horticulture sector has virtually improved the economy in several States. They are also of the view that focused attention on horticulture with the research and development input would result in increased production as well as exports besides brining about economic development not only for the States but for the nation as a whole. They recommend to the Department to highlight the growth potential of this sector to the Planning Commission and the Ministry of Finance and obtain funds for future research and development of this sector.

AGRICULTURE ENGINEERING

Availability of Funds

22. The Committee find that the network of AICRP help in identification of specific regional problems. They, however, find that the budget allocation for Agriculture Engineering Sector for the year 2014-15 is Rs. 85 crore (BE) while the RE for the year 2013-14 was Rs. 45 crore and for the year 2012-13 it was Rs. 52 crore. They find that allocation earmarked for the Twelfth Plan is Rs. 1100 crore. It can be seen that on an average the allocation should have been Rs. 220 crore per year, however, even in the 3rd year the allocation is not even 50% of the average per year for the Twelfth Plan. In response to the concern of the Committee about the implementation of R&D work in the institutes, the Department apprised them that the low allocation *inter-alia* affected the activities relating to promotion of mechanization for small and marginal farmers and also the promotion of post harvest technology, R&D work in precision farming, consortia research farming on farm mechanization and precision farming, front line demonstration programmes like improved tools, equipments and technologies etc. They note that level of farm mechanization in the country averages only around 25% which is quite low as against 90% in the developed countries. The Committee feel that these are the vital aspects where the AICRP network operates and due to the lack of funds allocation to the agricultural engineering sector, the most affected will be the small and marginal farmers. They recommend that the dissemination of information/knowledge relating to research, the prices and the geo-regional synchrony should reach the small and marginal farmers in

region-wise capsules. They also recommend to the Department to impress upon the Ministry of Finance and the Planning Commission the need for developing the knowledge and information relating to implements/instruments/machines being developed by ICAR for the welfare of small and marginal farmers and seek greater funds for this sector.

FIXATION OF PRICE FOR AGRICULTURAL IMPLEMENTS DEVELOPED BY ICAR

23. The Committee have been informed that Agricultural Engineering division of ICAR which is entrusted with the responsibility of developing suitable agricultural implements. According to the Department regional specifications have developed 65 implements/ instruments/machines during last three years. The divisions have also been successful in commercializing 79 agricultural implements/ machines in the same period thereby, generating revenue of Rs. 67.4 lakhs. They have also been informed that Technology pricing/ valuation is context-specific and can vary on case-to-case basis and valuation/pricing and terms and conditions for licensing/ commercialization emerges from the ground work of valuation, market research and business proposal development and done under the guidance of senior experienced scientists of relevant disciplines. The Committee are of view that there is need to enhance the abilities of institutes working under the division to increase the number of product development. They emphasize that the Department should focus on research of light weight technology and implements/machines/ instruments so that small and marginal farmers are able to use them effectively on their small and fragmented land holdings. The Committee, therefore recommend to the Department to enhance the target for development of new implements/machines/instruments. At the same time, the Committee strongly recommend the Department to incorporate suitable provisions in the terms and conditions as a prerequisite for transfer of technology of the research relating to implements/machines/instruments developed by ICAR for commercial use so that these are available to the farmers at reasonable prices.

KRISHI VIGYAN KENDRAs (KVKs)

Availability of Funds

24. The Committee are aware that KVKs do not have adequate staffs and other infranstucture at their disposal to carry out activities assigned to them.

The Committee note that the task ahead of the Department relating to equipping the KVKs in terms of trainer, resource person infrastructure, knowledge based on location specific requirements, paraphernalia for demonstrations/trials on crops, live stock, fisheries is of mammoth nature. At the same time, they find that KVKs proposed during XII Plan could not be taken up for want of approval of Cabinet. They are also aware that the allocations made for KVKs during first three years is Rs. 1575 crore, which is almost half of that proposed by DARE for the purpose and has been further reduced at RE level. The Committee are of the view that without availability of funds, which are only 27% (approx) of the earmarked outlays for the Scheme during XII Plan, this significant Research work will be undone *i.e.* if the knowledge is not disseminated to farmers the entire exercise will be futile. The Committee, therefore, strongly recommend that Department approach Ministry of Finance and Planning Commission highlighting the importance of developing KVKs with proper infrastructure for growth of Agriculture Sector and persuade them for higher allocations. They also recommend to the Department to pursue the matter relating to approval of KVKs to be opened during XII Plan urgently as already about three years of the plan period have elapsed. With this rate the Department will not be able to achieve their targets for the plan. The Committee also desire that Department should develop a mechanism to coordinate with the State Governments to come forward proactively for validation of the Research Work based on practical necessities on priority basis.

IMPROVEMENT IN WORKING OF KVKs

25. The Committee note that Krishi Vigyan Kendras(KVKs) act as centre for agriculture extension in the country. The KVKs assessed, refined and demonstrated technology/products through 33791 on farm trials and 1.71 lakh frontline demonstrations in different farming system in the year 2013-14 (upto March, 2014). The KVKs have trained 14.88 lakh farmers, trained 1.18 lakh extension personnel, participated in 102.41 lakh extension programmes for creating awareness on improved agricultural technology, produced 15700 tonnes of seed and provided 102.53 lakh plating material, tested 2.91 lakh soil and other samples in the year 2013-14 as against 17.38 lakh, 1.42 lakh, 170.16 lakh, 17400 tonnes, 117.46 lakh, 3.78 lakh for the year 2012-13 respectively. The aspect covered by KVKs mobile advisory has increased to 16.28 lakh as compared to 11.14 in the year 2012-13. The Committee

feel that presence of a strong institutional delivery mechanism for agricultural inputs is foundation for productive and remunerative agriculture. The Committee are, however, concerned to note that the achievements of the DARE in agriculture extension has reduced in 2013-14 *vis-à-vis* last year on all the important parameters of the scheme drastically, which is very alarming. The only area that have shown sign of growth is mobile advisory. The Committee are of the view that the Department needs to analyse and revisit the areas of concern and ensure that the knowledge obtained from research percolates to the fields and farmers and the trainers. The Committee also recommend that the Department should use the vast network of Rural Banks/Post Offices for dissemination of improved technologies and improved varieties of seeds besides capacity building programme of Branch Post Masters.

OPENING OF ADDITIONAL KVKs

26. The Committee has been informed that there is a provision of opening one KVK in each of the rural district of the country. However, in larger districts composite index ranking based on three parameters with equal weightage for ranking the districts, *viz.* Geographical Area, Rural Population and Net Sown Area, one additional KVK is sanctioned. The Committee note that ICAR has been able to establish only 641 KVKs in the country as on date. They also note that only 45 Districts in 10 States of the country has been able to get an additional KVKs. The Committee are of view that the provision for setting of one KVK in each rural district of the country is insufficient keeping in view large areas, number of farmers and diverse agro-climatic regions of the country. The Committee are of view that in order to disseminate information about the research, refinement of technology/products and its demonstration to maximum numbers of small and marginal farmers DARE should aim for establishment of one KVK in each Rural Block of the country. Only with this level of spread, the farmers of the country would be able to receive necessary information and agricultural input necessary for making agriculture a productive profession with suitable return on their investment. The Committee, therefore, recommend the DARE to devise ways and means for establishment of one KVK in each Block of the country. They also emphasize that Department should promote training from successful farmers to other farmers *i.e.* farmer to farmer training as well as training 'the trainer' for far and wide reach and coverage of knowledge *i.e.* covering and training 67 lakh farmers.

EXTENSION OF AICRP ON HOME SCIENCES TO ALL STATE AGRICULTURAL UNIVERSITIES

27. The Committee are aware that women in the country play a significant role in agricultural and allied sector activities. The Committee have been informed that Directorate of Research on Women Agriculture (DRWA) including AICRP on Home Science carry out activities on identifying gender issues, testing appropriateness of available farm technology and programmes with women perspective, drudgery reduction, empowerment of farm women, and capacity building of R&D to address gender issues in agriculture. They also note that many technological innovation in such activities where largely women are involved such as development of potato picker, grain spreading tools etc. have been developed by the DRWA and AICRP. They have also been informed during the 12th Plan period the DARE plans to extend AICRP to three more State Agriculture University in Meghalaya, Tamil Nadu and Gujarat. The Committee are of view that much more focus of research is required to address and facilitate women in their activities in agriculture and development of technology and agricultural implements which are specifically designed for reducing drudgery faced by women engaged in agricultural activities. The Committee, therefore, recommend DARE to allocate sufficient fund for this important area of research so as to facilitate women working in Agriculture sector. At the same time, the DARE should also try to extend AICRP on home sciences to all State Agricultural Universities apart from those planned in 12th Plan.

ATTRACTING YOUTH FOR CAREER IN AGRICULTURE

28. The Committee are aware that today's youth are unenthusiastic about taking up agriculture as a career. The youth are moving away from agriculture as a profession due to limited employment opportunity, high cost of production and low returns from this sector *vis-à-vis* the tertiary sector. They were, however, apprised by the representatives of DARE that this is a misnomer and mis-perception, the truth is that an investment of Re. 1 in agriculture sector reaps a return of Rs. 13.5. The Committee take note of rate of return on the investment in agricultural research. They also note that three new CAUs are being established during the 12th Plan for region specific agricultural research and education, Agricultural Research at Andhra Pradesh and Horticulture University in Telangana etc. The Committee in this regard urge the Department to revisit the existing agriculture education system in the

country and change the perception among youth about the remunerations from agriculture sector. They also recommend that the initiatives taken by the Department regarding setting up of CAUs for region specific agricultural research, AU in Andhra Pradesh and Horticulture University at Telangana, Student Rural Entrepreneurship Awareness Development Yojana is though a welcome step, however, should see light of the day within the stipulated time frame. They strongly recommend the Department to make all out effort for attracting, mentoring and retaining youth in agriculture.

NATIONAL AGRICULTURAL INNOVATION PROJECTS (NAIPs)

29. The Committee note that National Agricultural Innovation Projects (NAIPs) is initiative of the Indian Council of Agricultural Research (ICAR) with funding of Government of India and World Bank to broadly identify and promote technology led innovations in agriculture sector. The project aims to enhance multi-dimensional competence for steering-up agricultural R&D. The Committee have been informed that 171 public-private partnerships have been established in 203 sub-projects under NAIP financing and with additional financing from the Global Environment Facility(GEF) with total funding of Rs. 1518.87 crore. The Committee have been apprised that 118 patent/intellectual property protection application were filed and 82 technologies/products commercialized based on the NAIP research. Further, 57 new rural industries were piloted and over 8,371 hectares of farmers agricultural land brought under sustainable land-management practices under these projects. While appreciating achievements under the scheme, the Committee are of view that there is need for more of such projects where funding could be arranged through international organisations. They emphasize that the focus of such projects should reflect a shift toward demand driven research. The Committee, therefore, recommend DARE to strive hard to arrange more funds for R&D work in agriculture so that problem arising due to reduced allocation to the sector could be replenished upto some extent.

AGGROVATE INDIA PRIVATE LTD.

30. The Committee note that Aggrovate India Private Ltd. is DARE/ICAR owned PSU company formed to promote R&D outcomes through IPR protection, commercialization and forging partnership both in the country and outside. However, the Committee note that the

Company is yet to start its function effectively. The Company has generated revenue of Rs. 1.26 crore by licensing of tissue culture technology of palm oil and capacity building programmes since its inception in 2011. The company has also earned interest income of Rs. 9.06 crore from interest income. The Committee have been informed that AIL has initiated the establishment of a modern vaccine production plant (capacity 100-150 million doses) in PPP mode at Bengaluru campus of IVRI, Izatnagar in order to augment the availability of FMD vaccine. The Company is also assisting DARE on projects related to establishment of facilities for soil, water and tissue testing, seed production and demonstration, and Farm Science Centres in different countries in Africa. The Committee are of view that there is immense possibilities exist for the Company in the field of agriculture. The Committee recommend that Department should facilitate AIL to start effective marketing of technologies, seeds varieties and other R&D works of ICAR both in Indian and global market aggressively. The AIL should strive hard to achieve success in the field of agriculture marketing on the lines of work done by Antrix corporation for marketing of R&D works done by the ISRO. The Committee are of view that ICAR should involve all Institutes to engage AIL for commercialistaion of R&D works of these Institutes.

NEW DELHI;
10 *December,* 2014
19 *Agrahayana,* 1936 *(Saka)*

HUKM DEO NARAYAN YADAV,
Chairperson,
Committee on Agriculture.

ANNEXURE I

Uniform Sale Price of Breeder Seed for 2013-14 and 2014-15

(Rs./qtl.)

Crop	Breeder Seed Price for 2013-14	Breeder Seed Price for 2014-15
1	2	3
A. Cereal Crops		
Paddy		
Coarse	3800	3800
Medium	4000	4100
Basmati	6500	6700
Hybrid		
A Line	19000	20000
B and R Line	3900	4000
Maize		
Inbred lines	14300	14700
Varieties and Composites	3800	4000
Sorghum		
Hybrid		
A Line	14500	14500
B and R Line	10000	10000
Varieties and Composites	6500	6500
Bajra (Pearl Millet)		
Hybrid		
A line	19000	23000
B and R Line	8000	8000
Varieties and composites	8000	8000
Wheat		
Varieties (Bread wheat)	4200	4200
Durum/Dicoccum	4600	4700
Desi Wheat	4600	4700

1	2	3
Barley		
Barley	4100	4100
Malt Barley	4600	4600
Small Millets		
Finger Millet (Ragi)	3500	3600
Foxtail Millet	3000	3000
Kodo Millet	3000	3000
Proso Millet	3000	3000
Little Millet	3000	3000
B. Oilseed Crops		
Groundnut	9000	10000
Soyabean	7000	7500
Sesamum	12000	13500
Niger	7000	8000
Mustard		
Hybrid Mustard	7000	
A line	15000	15000
B and R Line	7000	7000
Varieties	7000	7500
Toria	7000	7000
Taramira	7000	7000
Linseed	4600	4600
Sunflower		
Hybrid		
A Line	30000	31000
B and R Line	15000	15000
Varieties	9000	9000
Castor		
Hybrid		
A Line	30000	30000
B and R Line	11000	11000
Varieties	8400	8500

1	2	3
	Safflower	
	Hybrid	
	A Line	12600	12600
	B and R Line	5500	5500
	Varieties	5500	5500
C.	**Pulse Crops**	
	Moong	12000	12000
	Urd (Black gram)	12000	12000
	Arhar (Pigeonpea)	
	Hybrid	
	A Line	13000	13000
	B and R Line	9000	9000
	Varieties	11000	11000
	Cowpea	7500	7500
	Gram (Kabuli)	11000	11000
	Gram (Desi)	8000	8000
	Lentil	8500	8500
	Peas	5500	5600
	Moth	8000	8500
	Rajmah	8000	8000
	Horsegram	4000	4000
D.	**Fibre Crops**	
	Jute	12500	12700
	Sunhemp	3500	6000
	Mesta	6000	6000
	Cotton	
	Hybrid	
	Female Parent	53000	55000
	Male Parent	53000	55000
	Varieties	15000	15000
	G. *hirsutam*	16500	17000
	G. *barbadens*	20000	22000
	Hybrid	
	A Line	60000	60000
	B and R Line	60000	60000

1	2	3
E. Forage Crops		
Guar	14500	12000
Teosinite	2500	2500
Lucerne	30000	31000
Berseem	26000	26000
Oat	4200	4200
Cowpea	7500	7500
Maize	4000	4000
Jowar	8000	8000 Single Cut
		12000 Multi Cut
Bajra	7500	7500
Dhaincha	5000	5000

ANNEXURE II

Indent and production of breeder seeds of different cereal crops during 2009-10 to 2013-14

(Production in Quintals)

CROPS	2009-10		2010-11		2011-12		2012-13		2013-14	
	Indent	Prod-uction	Indent	Prod-uction	Indent	Prod-uction	Indent	Prod-uction	Indent	Prod-uction
Wheat	32330	35049	29692	38469	28860	35745	20542	27502	20050	22492
Paddy	3880	5387	4604	6095	5772	6828	5267	11455	4747	5466
Sorghum	55	221	36	167	113	158	115	375	54	44
Maize	179	243	178	232	211	173	99	109	60	64
Barley	2496	3053	1778	2900	1842	1906	1029	698	843	1820
Pearl millet	8	8	10	28	15	32	17	67	11	37
Small millet	5	24	22	42	18	47	37	109	44	116
Total	38954	43985	36320	47934	36831	44889	27106	40315	25809	30039

APPENDIX I

COMMITTEE ON AGRICULTURE
(2014-15)

MINUTES OF THE THIRD SITTING OF THE COMMITTEE

The Committee sat on Friday, the 26th September, 2014 from 1100 hrs. to 1510 hrs. in Committee Room 'C', Parliament House Annexe, New Delhi with lunch break of 45 minutes from 1300 hrs. to 1345 hrs.

PRESENT

Shri Hukm Deo Narayan Yadav — *Chairperson*

MEMBERS

Lok Sabha

2. Shri Sanganna Amarappa
3. Md. Badaruddoza Khan
4. Shri C. Mahendran
5. Dr. Tapas Mandal
6. Shri Janardan Mishra
7. Shri Ajay Nishad
8. Shri Dalpat Singh Paraste
9. Shri Nityanand Rai
10. Shri Mukesh Rajput
11. Shri Konakalla Narayana Rao
12. Shri C.L. Ruala
13. Shri Arjun Charan Sethi
14. Shri Satyapal Singh
15. Shri Kadiyam Srihari
16. Shri Jai Prakash Narayan Yadav

Rajya Sabha

17. Shri A.W. Rabi Bernard
18. Shrimati Renuka Chowdhury
19. Sardar Sukhdev Singh Dhindsa
20. Shri Janardan Dwivedi
21. Shri Vinay Katiyar
22. Shri Mohd. Ali Khan
23. Shri Rajpal Singh Saini
24. Shri Ram Nath Thakur
25. Shri Shankarbhai N. Vegad
26. Shri Darshan Singh Yadav

SECRETARIAT

1.	Shri A. Louis Martin	—	*Additional Secretary*
2.	Smt. Abha Singh Yaduvanshi	—	*Director*
3.	Shri C. Vanlalruata	—	*Deputy Secretary*
4.	Shri Sumesh Kumar	—	*Under Secretary*

Ministry of Agriculture
(Department of Agricultural Research and Education)

1.	Dr. S. Ayyappan	Secretary (DARE) and DG (ICAR)
2.	Shri Arvind R. Kaushal	AS (DARE) and Secretary (ICAR)
3.	Dr. S.N. Puri	VC, CAU, Imphal
4.	Dr. Arvind Kumar	VC, Rani Laxmi Bai Central Agricultural University
5.	Dr. Swapan K. Datta	DDG (CS)
6.	Dr. K.M.L. Pathak	DDG (AS)
7.	Dr. B. Meenakumari	DDG (Fy.)
8.	Dr. N.K. Krishna Kumar	DDG (Hort.)
9.	Dr. A.K. Sikka	DDG (NRM)
10.	Dr. Ramesh Chand	DDG (Edn.)
11.	Dr. N. Gopalakrishnan	ADG (CC)

12.	Dr. Gudipati Venkateshwarlu	ADG (EQR)
13.	Dr. A.K. Vasisht	ADG (PIM)
14.	Dr. K.K. Singh	ADG (Engg.)
15.	Dr. A.K. Singh	ADG (Extn.)
16.	Dr. Pawan Kumar Aggarwal	ADG (NFBSFARA)
17.	Dr. A.P. Srivastava	National Coordinator (NAIP)

2. At the outset, the Chairman welcomed the members of the Committee and the representatives of the Ministry of Agriculture (Department of Agricultural Research and Education) and other officials to the Sitting and apprised the witnesses of the provisions of the Directions 55(1) and 58 of the 'Directions by the Speaker, Lok Sabha' regarding confidentiality of the proceedings.

3. Thereafter, the Committee raised various issues such as adequacy of budgetary allocation for achieving targets fixed for 12th Plan, need of improving local varieties of crops/cattle, need for judicious mix of traditional knowledge of farmers and scientific agriculture for enhancing agricultural growth, the need for research on pesticide resistant insects, inadequacy of soil testing laboratories, dissemination of research outcome to the farmers, status of mid-term evaluation of 12th Plan, need to expand number and coverage of Krishi Vigyan Kendras (KVKs), role of DARE in fixing price of seeds/machinery developed by ICAR and need of crop planning in view of climate variability. Most of the queries were responded to by the representatives of DARE. In regard of queries which could not be readily responded, the Chairperson desired the Ministry to furnish written replies within ten days.

4. A verbatim record of the proceedings has been kept separately.

The Committee, then, adjourned.

APPENDIX II

COMMITTEE ON AGRICULTURE
(2014-15)

EXTRACTS OF MINUTES OF THE TENTH SITTING OF THE COMMITTEE

The Committee sat on Wednesday, the 10th December, 2014 from 1500 hrs. to 1700 hrs. in Committee Room 'B', Parliament House Annexe, New Delhi.

PRESENT

Shri Hukm Deo Narayan Yadav — *Chairperson*

MEMBERS

Lok Sabha

2. Shri Sanganna Amarappa
3. Prof. Ravindra Vishwanath Gaikwad
4. Shri Nalin Kumar Kateel
5. Md. Badaruddoza Khan
6. Shri C. Mahendran
7. Shri Tapas Mandal
8. Shri Janardan Mishra
9. Shri Dalpat Singh Paraste
10. Shri Nityanand Rai
11. Shri Mukesh Rajput
12. Shri C.L. Ruala
13. Shri Arjun Charan Sethi
14. Shri Virendra Singh
15. Shri Jai Prakash Narayan Yadav
16. Shri B. S. Yediyurappa

Rajya Sabha

17. Shri A.W. Rabi Bernard
18. Shrimati Renuka Chowdhury
19. Shri Mohd. Ali Khan
20. Shri Ram Nath Thakur
21. Shri Shankarbhai N. Vegad
22. Shri Darshan Singh Yadav

SECRETARIAT

1.	Shri Abhijit Kumar	—	*Joint Secretary*
2.	Smt. Abha Singh Yaduvanshi	—	*Director*
3.	Shri C. Vanlalruata	—	*Deputy Secretary*
4.	Shri Sumesh Kumar	—	*Under Secretary*

2. At the outset the Chairperson welcomed the members to the Sitting of the Committee. The Committee, then, took up the draft Reports on the examination of Demands for Grants (2014-15) the Ministry of Agriculture (i) Department of Agricultural Research and Education and (ii) *** *** ***. After some deliberations, the Committee adopted the draft Reports without any modification and authorized the Chairperson to finalise the reports on the basis of factual verification from the concerned Departments and present the same to Parliament.

3.* *** *** *** *** ***

4.* *** *** *** *** ***

5.* *** *** *** *** ***

*** Matter not related to this Report.

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