



STANDING COMMITTEE ON AGRICULTURE
(2017-2018)

SIXTEENTH LOK SABHA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE
(DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION)

DEMANDS FOR GRANTS (2018-2019)

FORTY EIGHTH REPORT



LOK SABHA SECRETARIAT
NEW DELHI

MARCH, 2018/PHALGUNA, 1939 (SAKA)

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Presented to Lok Sabha on 06.03.2018

Laid on the Table of Rajya Sabha on 06.03.2018



**LOK SABHA SECRETARIAT
NEW DELHI**

MARCH, 2018/PHALGUNA, 1939 (Saka)

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COMPOSITION OF THE STANDING COMMITTEE ON AGRICULTURE (2017-18)
Shri Hukm Deo Narayan Yadav - Chairperson

MEMBERS

LOK SABHA

2. Shri Sanjay Dhotre
3. Prof. Ravindra Vishwanath Gaikwad
4. Shri Sanganna Amarappa Karadi
5. Shri Nalin Kumar Kateel
6. Smt. Raksha Tai Khadase
7. Md. Badaruddoza Khan
8. Shri C. Mahendran
9. Dr. Tapas Mandal
10. Shri Janardan Mishra
11. Shri Devji M. Patel
12. Shri Nityanand Rai
13. Shri Mukesh Rajput
- @14. VACANT
15. Shri Konakalla Narayana Rao
16. Shri C.L. Ruala
17. Shri Arjun Charan Sethi
18. Shri Virendra Singh
19. Shri Dharmendra Yadav
20. Shri Jai Prakash Narayan Yadav
21. Shri B. S. Yeddyurappa

RAJYA SABHA

22. Sardar Sukhdev Singh Dhindsa
- ^23. VACANT
24. Shri Meghraj Jain
25. Shri Vinay Katiyar
26. Shri Mohd. Ali Khan
27. Shri K.K. Ragesh
28. Shri Ram Nath Thakur
29. Shri R. Vaithilingam
30. Shri Shankarbhai N. Vegad
31. Dr. Chandrapal Singh Yadav

@ Vacant due to resignation of Shri Neiphio Rio from the Membership of Lok Sabha w.e.f. 22.02.2018 vide SG Notification dated 23.02.2018

^ Vacant due to retirement of Shri Janardan Dwivedi from the Membership of Rajya Sabha w.e.f. 27.01.2018 vide CB-I Note dated 16.01.2018

(iii)

SECRETARIAT

- | | | | |
|----|---------------------------|---|-------------------------|
| 1. | Shri D.S.Malha | - | Joint Secretary |
| 2. | Shri Arun K. Kaushik | - | Director |
| 3. | Smt. Juby Amar | - | Additional Director |
| 4. | Shri Nirantar Kumar Singh | - | Sr. Executive Assistant |

INTRODUCTION

I, the Chairperson, Standing Committee on Agriculture, having been authorized by the Committee to submit the Report on their behalf, present this Forty Eighth Report on the Demands for Grants (2018-2019) of the Ministry of Agriculture and Farmers Welfare (Department of Agricultural Research and Education).

2. The Committee under Rule 331E(1)(a) of the Rules of Procedure considered the Demands for Grants (2018-19) of the Department of Agricultural Research and Education, which were laid on the table of the House on 08 February, 2018. The Committee took evidence of the representatives of the Department of Agricultural Research and Education at their Sitting held on 22 February, 2018. The Report was considered and adopted by the Committee at their Sitting held on 05 March, 2018.

3. For facility of reference and convenience, the Recommendations/Observations of the Committee have been printed in bold letters in Part-II of the Report.

4. The Committee wish to express their thanks to the officials of the Department of Agricultural Research and Education for appearing before the Committee and furnishing the information that they desired in connection with the examination of Demands for Grants of the Department.

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;
05 March, 2018
16 Phalgun, 1939 (Saka)

HUKM DEO NARAYAN YADAV
Chairperson,
Standing Committee on Agriculture

CHAPTER- I
ANALYSIS OF DEMANDS FOR GRANTS

Introductory

1.1. Agriculture in India is the pivotal sector for ensuring food and nutritional security, sustainable development and for alleviation of poverty. Since quite some time, agriculture sector, as a whole, has been confronted with numerous challenges linked to food and energy crisis coupled with climate change and degradation of natural resources. This sector also influences essential ecosystem services such as water and carbon sequestration. Indian agriculture contributes to 8% global agricultural gross domestic product to support 18% of world population on only 9% of world's arable land and 2.3% of geographical area. Nearly one-third of the country's population lives below poverty line, and about 80% of our land mass is highly vulnerable to drought, floods and cyclones. On the brighter side, India possesses substantial biodiversity — nearly 8 % of the world's documented animal and plant species are found in our country. Many of these are considered crucial for livelihood security of poor and vulnerable population. Therefore, conservation of natural resources, maintenance of biological wealth and acceleration of agricultural growth are considered of paramount importance in the present context as well as of the future.

1.2. It is now realized that agriculture sector would have to face several challenges and threats, along with the opportunities that are emanating from both supply and demand perspectives. An effective agricultural invention-and-innovation continuum would play a crucial role in addressing a number of supply-side obstructions and in harnessing numerous demand-side opportunities. The preconditions for making agriculture sector more remunerative and sustainable would be to evolve effective mechanisms for technology delivery and to enhance capacity of all stakeholders in the invention-innovation continuum.

1.3. The Department of Agricultural Research and Education under the Ministry of Agriculture and Farmers Welfare coordinates and promotes agricultural research and education in the country. It provides government linkages to the Indian Council of Agricultural Research (ICAR). ICAR is an apex scientific organization at national level for planning, promotion, execution and coordination of agricultural research and education in the country. The Council has a strong agricultural research system with a wide network of institutes spread throughout the country and well established

institutional linkages with the State Agricultural Universities, other Departments of the Central and State Governments and international agencies. The goal of ICAR is to promote sustainable and inclusive agricultural growth and development in the country by interfacing education, research and extension initiatives complemented with efficient and effective institutional, infrastructure and policy support, for ensuring livelihood and environmental security.

It has been given the following mandate:

- Plan, undertake, coordinate and promote research and technology development for sustainable agriculture.
- Aid, impart and coordinate agricultural education to enable quality human resource development.
- Frontline extension for technology application, adoption, knowledge management and capacity development for agri-based rural development.
- Policy, cooperation and consultancy in agricultural research, education & extension.

DARE/ICAR consists of 70 Institutes including 04 Deemed Universities, 15 National Research Centres, 12 Directorates, 06 National Bureaux, 56 All India Coordinated Research Projects (AICRPs), 26 Network Projects and 681 Krishi Vigyan Kendras and 75 State and Central Agricultural Universities.

ANALYSIS OF DEMANDS FOR GRANTS (2018-19)

1.4. Demand No.2 pertaining to the Department of Agricultural Research and Education were laid on the Table of Lok Sabha on 08 February, 2018. The total Demand for 2018-19 under Scheme and Non-Scheme Heads together is Rs. 7800.00 crore (gross figure) of which Rs.2914.77 crore is under the Scheme Head and Rs.4885.23 crore under the Non-Scheme Head of the Grant.

					Rs in lakh
Sector (Outcome based Schemes)	Sub-sector (Outcome based Schemes)	2017-18			2018-19
		BE	RE	Actual	BE
CENTRAL SECTOR SCHEMES					

1. Management of Natural Resources		26036.00	26036.00	13225.00	32639.00
	1. Natural Resource Management including Agroforestry Research	16768.00	16768.00	7115.20	17439.00
	2 Climate Resilient Agriculture Initiative	5000.00	5000.00	3463.51	5200.00
	3. Agricultural Engineering	4268.00	4268.00	2646.29	10000.00
2. Crop Science		59111.00	59111.00	35072.28	105075.00
	4 Crop Science	38741.00	39966.00	23400.74	80000.00
	5 Horticulture Science	15490.00	15490.00	9114.17	20000.00
	6 National Agricultural Science Fund	4880.00	3655.00	2557.37	5075.00
3. Animal Science		38782.00	38782.00	21944.79	57069.00
	7 Animal Science	27197.00	27197.00	14685.61	40000.00
	8 Fishery Science	11585.00	11585.00	7259.18	17069.00
4 Agricultural Extension	9 Agricultural Extension	23251.00	23251.00	16524.98	24181.00
5 Agricultural Education		69466.00	69466.00	21114.70	72513.00
	10 Agricultural Universities and Institution	66337.00	66337.00	19958.08	68470.00
	11 Economics, Statistics & Management	3129.00	3129.00	1156.62	3254.00
	TOTAL	216646.00	216646.00	107881.75	291477.00
OTHER CENTRAL SECTOR COMPONENTS (NON-SCHEMES)		463354.00	482554.00	325149.13	488523.00
	Secretariat Economic Service	1398.00	1445.00		1430.00
	ICAR Headquarter	438256.00	457409.00	307319.13	459937.00
	National Academy of Agricultural Science	200.00	150.00		156.00
	Central Agriculture Universities	23500.00	23550.00	17830.00	27000.00
	GRAND TOTAL	680000.00	699200.00	433030.88	780000.00
	Note;NAAS and Secretariat Actual included in CAU				

***Actual Expenditure Upto 31.12.2017**

A. Scheme Head

1.5. It is evident that a substantial increase in the allocation at BE Stage from 2017-18 to 2018-19 has been made in the tune of almost 700 crore to the Department of Agricultural Research and Education under the Scheme Head. When asked about the

strategy of the Department regarding utilization of increased allocation for the year 2018-19, the Department in its written reply stated as under:

"The Department will utilize increased BE for the year 2018-19 particularly for the infrastructure development of new establishments and of the implementation of budget announcements of 12th Plan (IARI-Assam, IARI Jharkhand, Rajendra Central Agricultural University, Bihar, Rani Lakshmi Bai Central Agricultural University, Jhansi, Indian Institute of Agricultural Biotechnology (IIAB) Ranchi, National Institute of Agricultural Biotechnology (IIAB) Patna, Jharkhand, Jharkhand etc.). strengthening as unded to the

अभी हमारा ईएफसी बनने में इस साल ऐसा था कि ईएफसी सारा अप्रूवल होना था तो सितम्बर-अक्टूबर में अप्रूवल हुआ। अभी दो ईएफसी जो मेन बड़ी वाली हैं, वे एजुकेशन और एक्सटेंशन की ईएफसी है, अभी केबिनेट कमेटी ऑन इकोनोमिक अफेयर्स का फाइनल अप्रूवल मिलना है तो पूरे प्रोसेस में चार महीने लग गये हैं, r actual expenditure at BE and RE stage department submitted

अभी पिछले दो महीने से काफी एक्सपेंडिचर बच चुका है, यह हो जायेगा।

अभी हमारा ईएफसी बनने में इस साल ऐसा था कि ईएफसी सारा अप्रूवल होना था तो सितम्बर-अक्टूबर में अप्रूवल हुआ। अभी दो ईएफसी जो मेन बड़ी वाली हैं, वे एजुकेशन और एक्सटेंशन की ईएफसी है, अभी केबिनेट कमेटी ऑन इकोनोमिक अफेयर्स का फाइनल अप्रूवल मिलना है तो पूरे प्रोसेस में चार महीने लग गये हैं, काफी प्रश्नोत्तर के बाद अभी फाइनल हुआ है, इसलिए थोड़ा सा स्लो हुआ है, लेकिन अभी पिछले दो महीने से काफी एक्सपेंडिचर बढ़ चुका है, यह हो जायेगा।

1.7. The Department further submitted:

"The Department is making all round efforts to expend the remaining amount in last quarter of this fiscal. Details of actual expenditure upto January, 2018 are given below."

Details of actual expenditure upto January, 2018

DEMAND NO. 2 : DARE/ ICAR				
(Rs. In lakhs)				
S. No.	Thematic Area description	BE 2017-18	RE 2017-18	Actuals (Upto Jan 18)
Schemes Component				
	Natural Resource Management including Agroforestry Research	16768.00	16768.00	10004.24
	Climate Resilient Agriculture Initiative	5000.00	5000.00	3468.22
	Agricultural Engineering	4268.00	4268.00	3187.81

	Crop Science	38741.00	39966.00	25702.54
	Horticulture Science	15490.00	15490.00	12604.49
	National Agricultural Science Fund	4880.00	3655.00	2889.94
	Animal Science	27197.00	27197.00	17467.38
	Fisheries Science	11585.00	11585.00	8597.50
	Agricultural Extension	23251.00	23251.00	10926.62
	Agricultural Education	66337.00	66337.00	20426.15
	Economic, Statistics & Management	3129.00	3129.00	1529.46
Total Scheme Budget		216646.00	216646.00	116804.35
Other Central Sector Components (NON-SCHEMES)				
	ICAR Headquarter	438256.00	457409.00	340801.47
	Secretariat - Economic Service	1398.00	1445.00	20407.00
	National Academy of Agricultural Science	200.00	150.00	
	Central Agriculture Universities	23500.00	23550.00	
Total Other Central Sector Components (Non-Scheme)		463354.00	482554.00	361208.47
TOTAL DEMAND NO. 2 - DARE/ ICAR (SCHEMES + NON-SCHEMES)		680000.00	699200.00	478012.82

1.8. On being asked about Scheme-wise goals/targets of the Department, the Department submitted as follows: -

"The Department of Agricultural Research and Education (DARE) has prepared Scheme-wise goals/targets after detailed discussions with NITI Aayog and internal deliberation at different levels. The scheme wise targets of output and outcome for 2018-19 are mentioned in **Annexure-A**"

1.9. Further, when enquired about the system that exists under the Department for long term planning and assessment of financial resources to achieve goals envisaged in the field of Agricultural Sector, the Department replied :-

"The Department has a system for long term planning and assessment of physical targets and financial resources to achieve goals envisaged in the field of Agricultural Sector. Committees were constituted at different levels (Institute, Subject Matter Division and Council) including various stakeholders of Agricultural sector. Detailed discussions were held at these levels to finalize vision documents (for 2020, 2030 and 2050) of institutes and ICAR as a whole. These vision documents form the basis for long term planning and setting the goals/targets to be achieved through different planned activities. These vision documents were also shared with NITI Aayog. The Department has also undertaken elaborate exercise in collaboration with NITI Aayog to plan

and assess the financial resources to achieve goals envisaged in the field of Agricultural Sector."

B. Non- Scheme Head

1.10. The details of allocations and expenditure during 2017-18 and 2018-19 fiscal under non-scheme head of the Department are as follows:-

Sector (Outcome based Schemes)	Sub-sector (Outcome based Schemes)	2017-18			2018-19
		BE	RE	Actual	BE
OTHER CENTRAL SECTOR COMPONENTS (NON-SCHEMES)		463354.00	482554.00	325149.13	488523.00
	Secretariat Economic Service	1398.00	1445.00		1430.00
	ICAR Headquarter	438256.00	457409.00	307319.13	459937.00
	National Academy of Agricultural Science	200.00	150.00		156.00
	Central Agriculture Universities	23500.00	23550.00	17830.00	27000.00
Note;NAAS and Secretariat Actual included in CAU					

1.11. When queried about reasons for increase in allocation under Non Scheme Head at BE stage during the fiscal 2018-19, the Department in its written reply informed as under: -

"The BE 2018-19 allocations for Non-Scheme have been enhanced to meet additional requirement of funds for payment of revised Pay and Pension as per 7th CPC. Also, the revision in Pay for Scientific cadre of ICAR is under consideration."

C. PROPORTION OF BUDGETARY ALLOCATION VIS-À-VIS CENTRAL OUTLAY

1.12. As regards the proportion of budgetary allocation, the Department has informed that the proportion was 0.30% of total Central Plan Outlay in 15-16, 0.31% in 2016-17 and 0.32% in 2017-18. When asked about proportion of allocation for Fiscal Year 2018-19 and the funds proposed by the Department, the Department in its written reply submitted as under-

The proportion of budgetary allocation for the year 2018-19 is Rs. 7800.00 crore which is also 0.32% of total Central Plan Outlay. The department has proposed an amount of Rs 8380.92 crores for the fiscal year 2018-19.

1.13. The Department has also informed that the proportion of budgetary allocations made in favour of Department out of total budget of the Government during the last three fiscal years are far lesser *vis-à-vis* Higher Education, Food & Public Distribution and Fertilizers. When asked about the reasons for this, the Department in its written reply stated as under-

"Higher proportion of said Departments/ Ministries' budget is meant for subsidies and grants whereas DARE/ICAR's main activity is research and education and has no subsidy component in its budget *vis-à-vis* Higher Education, Food & Public Distribution and Fertilizers. Department has apprised Ministry of Finance several times to enhance the funds to the tune of 1% of Agriculture GDP..."

1.14. Elaborating further, the Department submitted as under:-

"The ICAR is a research organization, the main emphasis being to bring out products having enhanced productivity, quality and sustainability in the sectors of agriculture, natural resources, horticulture, animals, fisheries etc. In this endeavor, the Council has also a vast network of Krishi Vigyan Kendras spread all over the country to make awareness among farmers about various research outcomes (varieties/technological interventions etc.) through frontline demonstrations to farmers. Besides this, to equip our research institutions with talented manpower, the Council is working with as well as supporting various SAUs through logistical and financial resources to update their research and educational facilities so as to achieve international competence in educational field. Keeping in view the limited water and land resources i.e. keeping all such contemporary challenges in view, the Council is also laying emphasis on optimum utilization of water resources and also working on high value & diversified crops. All these efforts are going to increase the agriculture GDP of the country through higher production and quality enhancement in all the products of agriculture and allied sectors i.e agriculture, horticulture, animal, fisheries etc."

D. BUDGET & CASH MANAGEMENT

1.15. On the query regarding quantum of funds spent by the Department in each quarter of the last fiscal, the Department has furnished as under-

"The quantum of funds spent by the Department in each quarter of the last fiscal is given at **Annexure-II**.

E. FUNDS SURRENDERED

1.16. When asked about surrender of funds by the Department during 2016-17, the Department in its written reply stated as under:-

"After taking into consideration the object head-wise increase/decrease for various schemes and meeting the requirement of re-appropriations, an amount of Rs. 616.61 crore was surrendered for the year 2016-17. Further, an amount of Rs. 0.09 crore was surrendered by DARE under National Academy of Agricultural Sciences. An amount of Rs. 0.04 crore provided to the Department as Token (Rs. 0.02 crore each under Plan and Non-Plan) was also surrendered. Scheme wise details are given in **Annexure-III.**"

1.17. During the course of evidence, the Committee enquired about the reasons for surrender of funds during 2016-17, the representative of the Department stated that

मैं आपको बताना चाहूंगा कि यह एकचुअली उसका सरेंडर मानते हैं, जो भी माने, एकचुअली आरई में उतना कट कर दिये थे उस कट को सरेंडर मानते हैं, फाइनेंस जैसे भी डिस्क्राइब करता है, उस हिसाब से डिस्क्रिप्शन है। लेकिन अदरवाइज वह कट हो गया।

F. REVENUE RECIEPT

1.18. When asked about targets and achievements in respect of revenue generation by the Institutes of ICAR during last three fiscal years, the Department stated as under:-

"The targets for 2014-15, 2015-16 & 2016-17 and their actual achievements are enclosed at **Annexure-IV**"

G. IMPORTANT FEATURES OF DEMANDS FOR GRANTS (2018-19)

1.19. As regards, the important features of Demands for Grants (2018-19) highlighting new initiatives, plan for creation of Institutions/assets, enhancement of funds etc, the Department in its written reply stated as given below-

"The Department has taken several new initiatives to envisage quality agriculture research and education to cater the growing demand of the Country. These are as follows:

- Two new Central Agricultural Universities established for strengthening region specific agricultural research and education [Established Rani Lakshmi Bai Central Agriculture University, Jhansi,

and upgraded Rajendra Agriculture University, Samastipur, Bihar as Rajendra Central Agriculture University].

- National Research Centre on Integrated Farming, Motihari, Bihar established.
- National Agriculture Higher Education Project- Advancement of agricultural education for technology generation, human resource development and extension has been initiated.
- Redesigned curricula in degree programmes in agriculture and allied sciences.
- Declared December 03 as the National Agricultural Education Day to commemorate the pioneering contributions of Dr. Rajendra Prasad the Hon'ble First President of the country and also the First Agriculture Minister of the Country for creation of awareness and attracting talents.
- Initiated Pt. Deendayal Upadhyay unnat Krishi Shiksha Yojana to connect institutions of Higher education with local communities to evolve appropriate solutions for sustainable growth in Agriculture."

IARI type Institutions of Excellence in Jharkhand & Assam.

- Indian Agricultural Research Institute, Jharkhand has been established at Barhi, Jharkhand. The Government has approved it with Rs. 200.78 crore for three years i.e. upto March, 2020.
- Indian Agricultural Research Institute, Assam has already been established at Dhemaji district of Assam. The land at Dhemaji district had been transferred by State government.

Improve the efficiency and performance of *Krishi Vigyan Kendras*

- In order to improve the efficiency and performance of KVKs following the Budget Announcements 2016-17, a national level competition was held among 660 *Krishi Vigyan Kendras* with a total prize money of Rs. 50 lakh to improve the efficiency and performance of these *Kendras*.

RESEARCH THRUST:

Department (DARE/ICAR) has focused on following Agricultural Research/Education thrusts:

- Promoting innovations and improve human resource capacity by involving all stakeholders in the food-supply chain.
- Making India self-sufficient in production of pulses by year 2022, through enhanced breeder seed production and establishment of "Seed Hubs on Pulses" at State Agriculture Universities, KVKs and Institutes of the country.

- Strengthening institutional capacity for attaining sustainable food, nutrition, and livelihood security, and also for global competitiveness.
- Acting as a catalyst in reclaiming degraded resources for agriculture, and conserve and enhance national wealth of natural resources and biodiversity.
- Promoting adaptation and preparedness for meeting climate change challenge, and evolve mechanisms for effective drought and flood management.
- Fostering repositories of genetic resources related to crop, livestock, fish, insects and micro-organisms for their sustainable utilization.
- Improving knowledge management system to act as an efficient clearing-house of technology, knowledge and information in agriculture and allied sectors.
- Facilitating quarantine, evolving mechanisms for sanitary and phytosanitary inspection of germplasm under exchange for research, and perform other regulatory functions.
- Developing and facilitating gradual replacement of pesticides, and executing mechanisms for bio-security of the country, especially that emerging from threat of gene piracy and cross-border vector-borne diseases.
- Reforming agricultural education and extension systems, and enhance human resource befitting global competition.
- Fostering linkages and collaborations with public, private, national and international organizations.

Enhancement in allocation of schemes

(Rs in lakhs)

CENTRAL SECTOR SCHEMES		2017-18 BE	2018-19 BE	Increase
Sector (Outcome based Schemes)	Sub-sector (Outcome based Schemes)			
1. Management of Natural Resources		26036.00	32639.00	6603.00
	1. Natural Resource Management including Agroforestry Research	16768.00	17439.00	671.00
	2 Climate Resilient Agriculture Initiative	5000.00	5200.00	200.00
	3. Agricultural Engineering	4268.00	10000.00	5732.00
2. Crop Science		59111.00	105075.00	45964.00
	4 Crop Science	38741.00	80000.00	41259.00
	5 Horticulture Science	15490.00	20000.00	4510.00
	6 National Agricultural Science Fund	4880.00	5075.00	195.00

3. Animal Science		38782.00	57069.00	18287.00
	7 Animal Science	27197.00	40000.00	12803.00
	8 Fishery Science	11585.00	17069.00	5484.00
4 Agricultural Extension				
	9 Agricultural Extension	23251.00	24181.00	930.00
5 Agricultural Education		69466.00	72513.00	3047.00
	10 Agricultural Universities and Institution	66337.00	68470.00	2133.00
	11 Economics, Statistics & Management	3129.00	3254.00	125.00
	TOTAL	216646.00	291477.00	74831.00

CHAPTER- II

SCHEMATIC ANALYSIS

2.1. Indian Council of Agricultural Research is devoted to conduct activities of agricultural research, education and extension. The Council is organized into eight Subject Matter Divisions (SMDs) viz. i) Crop Science, ii) Natural Resources Management iii) Horticultural Science, iv) Animal Science, v) Fisheries Science, vi) Agricultural Engineering vii) Agricultural Education, and viii) Agricultural Extension and they are entrusted with the overall responsibility for the preparation, scrutiny, review, and technical supervision and guidance of the research schemes, educational programs and projects within their respective disciplines.

A. CROP SCIENCE

2.2. Under the head of Crop Science, the allocations at BE stage for 2018-19 has been increased to 77.75% as compared to BE during 2017-18. The details of status of allocation and utilization of funds are as follows:-

(Rs. in crore)

YEAR	BE	RE	Actual Expenditure
2015-16	570.00	495.00	481.69
2016-17	507.75	436.56	434.21
2017-18	591.11	591.11	350.72
2018-19	1050.75		

*Actual Expenditure upto December, 2017

2.3. The Committee enquired about the plans of the Department to utilize the enhanced funds under Crop Science division, the Department in its written note submitted as given below-

"Enhanced funds of the Divisions would facilitate the development of improved crop varieties/ hybrids, cost-effective production and environment-friendly crop protection technologies to enhance crop productivity in ensuring food and nutritional security in the country. The main emphasis will be on the development of trait-specific high yielding crop varieties and hybrids. More efforts will be directed towards research endeavors on oil seed and pulses, in making self-sufficiency of pulses in the country"

2.4. The Department further stated as under:

"With enhanced funds required infrastructure and facilities would be made available to facilitate research outcome of the division. Consortium Research Platforms and Incentivizing Research in Agriculture operating in the Division will be able to carry focused research on priority based targets."

(i) Crop Science

2.5. Crop improvement is the mandate of Crop Science Division, which is the largest division of ICAR. The Division, through its 21 Research Institutes, 03 Bureaux, 02 National Research Centres, 02 Project Directorates, 22 All India Coordinated Research Projects and 10 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 and environment-friendly crop protection technologies to enhance crop productivity and ensure food and nutritional security in the country. The main emphasis has been on development of trait-specific high yielding crop varieties and hybrids. During 2017-18 a total 209 including 13 bio-fortified, new varieties/hybrids tolerant to various biotic and abiotic stresses with enhanced quality have been developed for Cereals, Pulses, Oilseeds, Commercial and Forage crops.

2.6. During the evidence, while apprising about the contribution of the Department the representative stated as under:-

वर्ष 2016-17 भारतीय कृषि के लिए काफी महत्वपूर्ण साल रहा। हमारा खाद्यान्न उत्पादन 275 मिलियन टन पार कर गया। सबसे बड़ी बात यह है कि दलहन उत्पादन में हम करीब-करीब सेल्फ सेफीशिएंट हो गए हैं। 23 मिलियन टन उत्पादन पहुंच गया है और पिछले साल हम 6 मिलियन टन एक्सट्रा उत्पादन कर पाए हैं। यह अपने आप में एक रिकार्ड है, एक माइल स्टोन है। इसके अलावा बागवानी फसलों में हमारा उत्पादन तीन सौ मिलियन टन पार गया है, जो अपने आप में एक रिकार्ड है। जलवायु अनुकूल रही और इसके साथ-साथ हमारी सरकारी स्कीम्स काफी अनुकूल रहीं। टेक्नोलॉजी का भी इसमें काफी कंट्रीब्यूशन रहा। दलहन उत्पादन में हम एक एनालिसिस किए थे, जो छः मिलियन टन एडीशनल एक साल में मिला, साढ़े तीन मिलियन टन हमें एरिया एक्सपेंशन से मिला और ढाई मिलियन टन उत्पादकता बढ़ने

से, कुल 6 मिलियन टन ज्यादा प्राप्त हुआ। 2017-18 में हमारी उपलब्धि भी है। पिछले साल 2016-17 में हमारी टोटल किस्म खेत फसल में 310 थीं और इस बार करीब-करीब 351 नई किस्म 2017-18 में दिए हैं।

2.7. The representative further submitted-

आठ नये बीटी कॉटन, पहले यह शंकर किस्म हुआ करता था और सारे प्राइवेट कंपनीज के द्वारा हुआ करता था। इस बार बीटी कॉटन लाए हैं, जो किसान यूज कर सकता है और तीन साल तक आसान से उसको उगा सकता है। इस तरह की आठ नई किस्म हम रिलीज किए हैं। यह महत्वपूर्ण है।

इसके अलावा एक लाख बाइस हजार किंवटल सीड उत्पादन किए हैं, ब्रीडर सीड के बारे में आप भलीभांति जानते हैं जो नए किस्म आते हैं उसे किसान लेने के लिए जाते हैं। उसके मुताबिक प्रजनक बीज उत्पादन करते हैं। एक लाख बीस हजार प्रजनक बीज उत्पादन करके सप्लाई किया है।

2.8. When asked about the major new research works undertaken by the institutes under the Division during last three years, the Department in its written reply submitted as under-

"New research works undertaken by the institutes under the Division during last three years were pertaining to development of newer hybrids in select crops with wider adaptability, C-3 to C-4 conversion, bio-fortification in major food crops, molecular breeding for improved traits and breeding for improved photosynthetic efficiency and adaptation for low light intensity in eastern zone of the country. Bioinformatics of second generation of genetics, allele mining, molecular breeding and transgenics for the development of designer crops. In order to ensure adequate availability of fodder crops for better animal nutrition, division pursued development of improved genotypes in fodder crops suited to different agro-climatic conditions and cropping sequences. Other aspects like resource conservation technology for cropping systems, specific technology development for hill agriculture and post-harvest processing of crop commodities have been carried out.

Newer approaches like millets for diversification of food basket and nutritional security, terminal heat tolerance in wheat, improved rice hybrids and basmati varieties, quality protein maize hybrids with better

adaptability, tobacco seed oil for edible purpose, high sugar varieties with novel research methodology for better sugar recovery from sugarcane, well adapted high yielding oilseeds and pulses for better nutrition, high strength cotton genotypes and high density planting system for cotton besides enhanced fibre quality in jute and allied fibres are other areas that have received attention.

Effective management tools for emerging pests and diseases, efficient mass production techniques for strains and biotypes of insects and other bio control agents, pollination efficiency and production of useful products through honeybee, effective rodent control systems and management options for containing wild animal problem in field crops are given thrust. Microbial diversity analysis from exotic environments and DNA bar coding of important insects were worked out.

Apart from these; Four Consortium Research Platform Projects and one Incentivization project initiated and were implemented with specific objectives in niche areas and are operating at multi-locations under the NARS system. These are:

- a. Consortium Research Platform on Hybrid Technology
- b. Consortium Research Platform on Molecular Breeding
- c. Consortium Research Platform on Biofortification
- d. Consortium Research Platform on Agrobiodiversity
- e. Incentivizing Research in Agriculture"

2.9. While answering to the query during the course of evidence regarding availability of quality seeds to the farmers, the representative submitted-

किसान के पास सही क्वालिटी का बीज पहुंचे, यह बात काफी माननीय सदस्यों ने सामने रखी है। हम कोशिश करते हैं तो ब्रीटर सीड सप्लाय करते ही हैं, लेकिन जब ये सर्टिफाइड सीड बनता है तो यह पाया जाता है कि कई बार उसमें जो क्वालिटी होती है, वह नहीं होती। उसके लिए एक सीड बिल आ रहा है उसमें यह प्रावधान है कि किस तरीके से इसको कंट्रोल किया जाए और दण्ड का क्या प्रावधान किया जाए, जो लोग मिलावट करते हैं और जो क्वालिटी मेनटेन नहीं करते हैं। उसमें जांचने के लिए भी व्यवस्था होगी ताकि सीड इंस्पेक्टर जाकर जांच करके इनफोर्स करेगा कि क्वालिटी मेनटेन हुई।

दूसरी बात यह कि हम जो डायरेक्ली प्रॉड्यूस करके किसान को देते हैं। पूरे देश में उसकी डिमाण्ड बहुत ज्यादा है।

2.10. Regarding steps undertaken by ICAR institutes under Crop Science Division to enhance productivity and improve farmers' income during last three years the Department in its written reply submitted as under-

"In order to enhance productivity and improve farmers income in the country, ICAR Institutes under crop science division in collaboration with SAUs conducting basic and strategic research related to improvement and production of rice, wheat, maize, millets, fodder crops, oilseeds, pulses, sugarcane, cotton and other fiber crops through 26 commodity based research institutes and 32 All India Coordinated Research Projects (AICRPs) and All India Network Projects (AINPs) to develop location specific crop varieties and matching technologies as per the agro-ecological needs. During last three years, the Division has developed 597 high yielding varieties/hybrids of field crops comprising 316 of cereals, 94 of oilseeds, 83 of pulses, 52 of fibre crops, 34 of forage crops and 18 of sugar crops for various agro-climatic conditions of the country. Utmost efforts have been made to bring all the newly released varieties in seed chain so that quality seeds of these varieties may reach the farmers in minimum time which helps in enhancing the productivity and improve farmers' income. The seed production details of different field crops varieties during last three years are as under:

A. Breeder seed production (Quintals) against the indent received are as under

Crops	2014-15		2015-16		2016-17	
	Indent	Prod.	Indent	Prod.	Indent	Prod.
Cereal Crops	45587.36	63127.78	64505.15	81996.86	48681.60	69719.63
Pulse Crops	10781.25	11242.37	10252.12	11244.96	17839.83	18702.50
Oilseed Crops	28664.46	24239.43	45941.89	32963.50	36640.18	33147.06
Fibre Crops	162.53	183.48	117.58	181.68	160.42	229.89
Forage crops	1096.64	1281.71	1342.87	1436.36	723.66	817.10
Total	86292.24	100074.77	122159.61	127823.36	104045.69	122616.18

B. Quality seed production (Quintals) and planting material produced

Particulars	2014-15	2015-16	2016-17
Foundation seed (q)	86571.32	78079.72	77331.85

Certified seed (q)	44432.01	31326.80	77454.47
TFL seed (q)	66251.60	76444.56	51630.23
Participatory seed production (q)	248117.47	213797.54	291259.13
(FS, CS & TFL)			

(ii) Horticulture Division

2.11. Horticulture Science Division coordinates and monitors the research programs in the country with the network of 12 Research Institutes, 06 National Research Centres, 05 Project Directorates, 10 All India Coordinated Research Projects and 02 Network Research Projects for technological development in enhancing the horticulture crop productivity through science led growth in the sector. The division has focused research pertaining to development of trait specific varieties and root stocks, molecular markers linked to biotic and abiotic stresses, monitoring and preparedness for invasive and emerging pests and pathogens, enhancing input use efficiency and safe production, exploitation of male sterility systems, transmission of important viruses by vector pests, development of diagnostic kits for identification of pests and diseases, production of quality seed and elite planting material and post- harvest management strategies for production of value added products.

2.12. Under the head of Horticulture Science, there has been an increase in allocation for 2018-19 at BE stage which is around 30% of allocations made at BE Stage during the year 2017-18. The details of status of allocation and utilization of funds are as follows:-

(Rs. in crore)

YEAR	BE	RE	Actual Expenditure
2015-16	225.00	180.00	175.54
2016-17	200.00	160.00	158.81
2017-18*	154.90	154.90	91.14
2018-19	200.00.		

*Actual Expenditure upto 31.12.2017

2.13. The Committee note that despite no increase in allocation at RE Stage during 2017-18, the Department has been able to utilise only about 58% percent of funds (up to 31.12.17).

2.14. When asked about affect of the under utilisation of funds on the research work in particular and institutes in general under Horticulture Science Division, the Department in its written reply stated as under-

"The EFCs of all the five Schemes were approved during September-October to 2017. As a result, expenditure involving policy decisions were deferred for the time being, and hence there was reduced expenditure. However, research activities were carried out within the available funds and there was no adverse impact on major research programmes. Henceforth, the budget utilization will be hastened by taking up pending works and creation of assets and strengthening of research facilities."

2.15. As regards plan of action for utilization of enhanced funds at BE stage during the fiscal 2018-19, the Department in its written reply submitted:-

"There are five Schemes under the Horticultural Science Division of the ICAR-

Scheme I: Tropical and sub tropical Horticulture

Scheme II: Temperate Horticulture

Scheme III- Vegetable Crops

Scheme-IV: Plantation Crops and Island Ecosystem

Scheme-V: Arid Horticulture, Spices and Medicinal & Aromatic Plants

The Division has pending committed liabilities of the XII Five Year Plan with respect to creation of assets and Research Infrastructure and salary of Scientists under All India Coordinated Research Projects. The Enhanced budget has been proposed to meet out these committed liabilities on incremental salaries and creation of infrastructures for research such as laboratory facilities and equipments for conducting research on thrust areas. Further, technology dissemination, training of farmers on advanced horticultural technologies, creation as well as strengthening of facilities for production of seeds and planting materials for the stakeholders is core activity of the Institutes and the enhanced budget has been proposed to meet out all these expenses."

2.16. On being asked to furnish Institute-wise details of plant varieties and hybrids developed and released by the Horticulture Division during the last five years, the Department in its reply submitted as under-

"Institute-wise details of plant varieties and hybrids developed and released by the Horticulture Division during the last five years are given in **Annexure-V**."

2.17. During the course of evidence, the representative of the Department added as under:

प्लान्टिंग मैटेरिअल किसानों को दिए हैं। इसके अलावा वैरायटी, सीड के अलावा 53 हार्टीकल्चर प्रोडक्शन प्रोटेक्शन टेक्नोलॉजी भी बना कर किसान के पास पहुंचाने के लिए कोशिश की है। अभी किसान के पास पहुंचने के लिए मोबाइल एप ज्यादा से ज्यादा बना रहे हैं और किसानों तक पहुंचा भी रहे हैं। एग्रीकल्चर क्रॉप में नौ मोबाइल एप बना कर किसानों को देने के लिए कोशिश की है।

2.18. When queried regarding efforts have been made by ICAR to develop new crop varieties and hybrids for Onions, potatoes and tomatoes having increased shelf life in order to minimize wastages, the Department submitted as given below-

"During XII Five Year Plan considerable efforts were made and 12 varieties of tomato, ten of onion and four of potato were evolved. Apart from having tolerance/resistance to important pests and diseases, these are high yielding and have better shelf-life with potential to minimize wastage.

Tomato (12): Arka Rakshak, Arka Samrat, Kashi Abhiman, Kashi Aman, Kashi Adarsh, Kashi Amul., DARL-68, Punjab Ratta, ATL 08-21, Improved Bhagya, 2011/TODHyb-2, Kaveri - 304 (KTH-304)

Onion (10): Bhima Safed, Bhima Light Red, Bhima Raj, Bhima Red, Bhima Kiran, Bhima Dark Red, Bhima Shweta, Bhima Shubhra, Bhima Super, Bhima Shakti

Potato (4): Kufri Gaurav, Kufri Garima, Kufri Lalit and Kufri Mohan."

2.19. Regarding efforts made by the institutes under Horticulture Division for reduction in post harvest losses of horticultural produce during last three years, the Department in its written reply stated-

"The Horticultural Science Division is mandated with developing production technologies for horticultural crops. To address the issues pertaining to post-harvest-losses, researches have been taken up to develop the value added products in various crops. During the last three years, fifty technologies have been developed which are largely helpful in minimization of post-harvest losses. Of the above, several technologies have been licensed while others are being demonstrated to stakeholders."

2.20. On the efforts made by ICAR Institutes for cultivation of highly specialized medicinal and aromatic plants during the last five years, the Department in its written reply submitted as given below-

"The Horticultural Science Division of ICAR is having a full-fledged Directorate on Medicinal and Aromatic Plants and an AICRP on Medicinal and Aromatic Plants for validation of location specific technologies. During the last five years, following achievements have been made in this direction."

Varieties identified/developed in MAPs during the last five years:

Crop	Variety
Isabgol (<i>Plantago ovata</i>)	Vallabh Isabgol-1
Isabgol (<i>Plantago ovata</i>)	Vallabh Isabgol-2
Isabgol (<i>Plantago ovata</i>)	Vallabh Isabgol-3
Ashwagandha (<i>Withania somnifera</i>)	AWS-1 or GAA-1
Asalio (<i>Lepidum sativum</i>)	RVA-1007
Asalio (<i>Lepidum sativum</i>)	HLS-4

Efforts made for the cultivation of highly specialized Medicinal and Aromatic Plants

- Twenty seven on farm trials/ FLDs were conducted in Lemon grass (*Cymbopogon flexuosus*), Palmarosa (*C. martinii*), Brahmi (*Bacopa monnieri*) and Tulsi (*Ocimum*spp)
- Ten farmers' training were organized in which about 1300 farmers were benefitted
- Three Farmers' fairs were organized and about 400 farmers were benefitted

- Good Agricultural Practices of eight medicinal crops [Isabgol (*Plantago ovata*), Senna (*Cassia angustifolia*), Kalmegh (*Andrographispaniculata*), Ashwagandha (*Withaniasomnifera*), Mandukparni (*Centellaasiatica*), Artemesia (*Artemesiaannua*), Lemongrass and Palmarosa] for higher productivity
- Organic farming technologies for Tulsi, Kalmegh and Isabgol were standardized for the benefit of the farmers and stakeholders.
- Distinctiveness Uniformity and Stability (DUS) descriptors developed by the DMAPR were notified by the PPVFRA' in Isabgol (*Plantago ovata*) and Kalmegh (*Andrographispaniculata*) for the registration of new varieties.
- Developed GAP and GFCP certification national standards with the help of National Medicinal Plant Board (NMPB) and Quality Council of India (QCI).
- A good agricultural and collection practices (GACP) training toolkit for medicinal plants have been developed in collaboration with Food and Agriculture Organization (FAO) which comprises of a) Trainer's Manual, b) GACP video, (c) Illustrated cause-effect training tool kit and (d) Illustrated booklet for the benefit of quality assurance of raw drugs
- Technology for preparation of enriched compost from Isabgol straw and low-graded rock phosphate has been developed.
- Innovative technology for removing coloured impurities from water by utilizing aromatic plant waste.
- Process development for catechin enriched extracts was standardized in Ashoka (*Saracaasoca*)
- Six patents applications were filed as follows:
 - a. Process of obtaining swertiamarin powder concentrate from *enicostemma* species and an encapsulated formulation based on the same (Patent filed no.201711006971)
 - b. Devolvement of microencapsulated formulation based on andrographolide and method of preparation (Patent filed no 201711006972)

- c. A method for encapsulation of *gymnemic* acid enriched fraction from *Gymnemasylvestre* and encapsulated formulation thereof (Patent filed no 201711006973)
- d. Stored grain protectant composition based on active botanicals and method of preparation thereof (Patent filed no.201711009174)
- e. A botanical based composition for control of Mosquitoes and Housefly and methods thereof (Patent filed no.201711008664)
- f. Seed coating composition based on bioactive botanicals and method for preparation thereof (Patent filed no.201711008663)

2.21. On the query regarding any study conducted by the ICAR for recognition of State-wise/District-wise specific horticulture crops in the Country, the Department stated as under-

"No study has been conducted by the ICAR for recognition of State-wise/District-wise specific horticulture crops in the Country. However different horticultural crops under tropical, sub-tropical, temperate, semi-arid and arid zones are being recommended for cultivation in different parts of the country. Further the varieties are being evaluated for their location specific suitability through the 11 ICAR-All Indian Coordinated Research Projects (AICRP) and two ICAR-All India Network Research Project (AINRP) on different crop/commodity specific crops and are being recommended as per their suitability for different agro-climatic regions."

B. ANIMAL SCIENCE

2.22. The allocation for Animal Science Division, has been increased to Rs, 570.69 crore during 2018-19 from 387.82 crore at BE/RE stage during the year 2017-18. The details of status of allocation and utilization of funds are as follows:-

				(Rs. in crore)
YEAR	BE		RE	Actual Expenditure
2015-16		250.00	226.00	208.57
2016-17		260.00	201.00	194.46
2017-18*		387.82	387.82	219.44
2018-19		570.69		

*Actual Expenditure Upto 31.12.2017

2.23. The Committee note that despite no increase in allocation at RE Stage during 2017-18, the Department has been able to utilise only about 56 percent of funds

allocated at BE stage during last fiscal. While furnishing reasons for this the Department in its written reply stated as under-

"Under-utilization of funds has been mainly due to the approval and the sanction of the SFC/ EFCs of the schemes, which were conveyed mostly in the later half of the financial year, and hence funds allocated for non-recurring items (works and equipments) could not be utilized. The actual expenditure up to January is 70.85%. Further, allocations during RE 2017-18 to three North East Institutes have been made under heads 'Other than NEH & TSP' and 'TSP' in addition to under the head 'NEH'. Approval of Competent Authority has been sought to allow the Institutes to incur expenditure under these heads."

2.24. When asked how the enhanced allocations at BE stage during 2018-19 would help in the implementations of schemes and Research activity by the institutes under division of Animal Science, the Department stated:-

"The BE 2018-2019 specifically for Animal Science is Rs. 400 crores. The balance amount out of Rs. 570.69 crore (Rs. 170.68 crore) pertains to Fisheries Science. This enhanced BE will be utilized for approved R&D activities of schemes and sub-schemes to generate / improvise technologies for enhanced livestock and poultry productivity, skill up-gradation and improved profitability to the end-users."

(i) Animal Science

2.25. Animal Science Division coordinate and monitors research programs for sustainable enhancement of productivity and improvement in health status of livestock and poultry in the country through its 10 Research Institutes, 01 Bureaux, 06 National Research Centres, 02 Project Directorates, 07 All India Coordinated Research Projects and 07 Network Research Projects. The mission is to facilitate need based priority research in livestock and poultry sector in on-going and new emerging areas to support productivity increase, thereby reducing the gap between potential and actual yield in the current era of globalization to meet the challenges ahead for production, processing and value addition of animal produce and of better animal health care. During 2017-18, two Crossbred pig (TANUVAS KTM Gold and SVVU-T 17) varieties were developed. Registered 09 new populations of livestock and poultry as breeds and phenotypically characterized Chitrangi sheep. Conserved/ cryo-preserved more than 18000 semen doses of cattle, crossbred cattle, goat breeds, yak, equines and buffalo bulls and developed semen freezing and AI technology for goats with 50% success rate. Developed 09 diagnostics / vaccines / kits and 22 New / improved products or process.

Improvement of Cattle Breeds

2.26. When queried about efforts made by the Animal Science Division to conserve indigenous cattle breeds of superior quality and genetical improvement of the indigenous varieties during last five years, the Department submitted as under-

"Department in collaboration with state agricultural / veterinary universities, NGOs / state animal husbandry departments is undertaking indigenous improvement programme covering three indigenous breeds i.e. Sahiwal, Gir and Kankrej in their respective breeding tracts. The project is aimed to conserve, propagate and improve the genetic potential of these three indigenous cattle breeds. The project established germplasm (GP) and data recording units (DR) for each breed by registering the animals maintained under farm and field conditions, respectively and has registered improvement in first lactation (305 days) milk yield in Gir, Kankrej and Sahiwal cattle since inception. A total of 10,000 Kankrej; 21,826 Gir and 813 Sahiwal cows from the farmer herds have been covered under the project. A total of 159563, 121158 and 1,57,548 semen doses of Gir, Kankrej and Sahiwal bulls have been frozen and 121848, 1,11690 and 83802 doses, respectively are available for future breeding.

To conserve indigenous cattle breeds, department cryopreserved 88000 semen doses from 154 bulls of 24 breeds. Special efforts are made to conserve Ongole, Bargur, Khillar, Rathi, Nagori and Dangi. The semen is being provided to various stakeholders who are working in the area of conservation and improvement of indigenous cattle. Further, for conservation of Sahiwal, Haryana cattle, efforts are being made to produce superior breeding males at selected Gaushalas."

2.27. Regarding major research works by the institutes during the last three years under Animal Science Division, the Department stated as under-

"The major research works carried out by the Institutes under the Division on 1) Dairy Production and Technology; 2) Small Ruminants Production and Technology; 3) Animal Nutrition and Products Technology; 4) Animal Health Management; 5) Animal Genetic Resource Management, Production and Improvement and 6) Pig Production and Hill Animal Agriculture. The research programmers of the Division through associated research institutes are addressing issues specific to states / regions / agro-climatic zones/ production systems, the R&D efforts have been concentrating on with the overall objectives of improving profitability, nutritional / livelihood security of farmers through infusion of improved / high-yielding technology with required skill upgradation keeping input cost to the minimum ensuring quality and profitable outcome. The Institutes carried out research on the followings:

- Surveyed, characterized and registered new populations as breeds.

- Need based *in-situ* and *ex-situ* conservation of livestock and poultry breeds / varieties / strains.
- Performed research on genetic improvement of livestock and poultry for various qualitative and quantitative traits as well as developed new strains with improved productivity.
- Developed vaccines and diagnostics for diseases as well as research carried out for effective monitoring, surveillance and forecasting of diseases.
- Developed Kits for detection of adulterants in milk, meat for quality assurance.
- Developed new / improved processes for value addition of milk, meat and fibre.

2.28. During the course of evidence the representative of the Department further added: -

पशुधन में ज्यादातर नॉन-डिसक्रिप्ट पशुधन देश में हैं, इस साल 160 ब्रीड को आइडेंटिफाई रजस्ट्रेशन कराए थे, इस साल नौ नए ब्रीड को पहचान करके रजस्ट्रेशन कराया है। इसके अलावा दो नए किस्म के सुअर का विकास किया है। छह लाख चिकस किसानों को विभिन्न प्रांतों में सप्लाई किया है, यह ज्यादातर पोल्ट्री में है।

2.29. On the issue regarding type of diseases in cattle and livestock and mechanism available for forecast, surveillance and monitoring of diseases in the country, the following has been stated by the Department in its written reply

"Department has developed an interactive, dynamic, relational online animal disease forewarning system namely NADRES (National Animal Disease Referral Expert System). This database includes State wise or Region wise information on 13 major livestock diseases in the country. Through NADRES, the probable occurrence of disease upto district level two month in advance is forecasted. This forewarning and forecast information is circulated to all the state animal husbandry departments for effective control and prevention of disease."

2.30. As regards the achievement made by the ICAR in development of vaccine for tackling widespread disease among livestock in the country, the the Department in its written reply stated as under

"Achievements made by the ICAR in development of vaccines for

tackling widespread disease among livestock in the country are as under;

- Developed and released Equiherpabort (EHV-1) vaccine, which is the only indigenous vaccine as substitution to imported commercial vaccine. Department is supplying vaccine to farmers on demand basis.
- Developed an updated equine influenza vaccine containing Indian isolate of Clade-2 was and is being provided to farmers on demand basis.
- Vero cell based Seep Pox Vaccine- Srinagar Strain vaccine has been developed and transferred to M/s Intervet India Private Limited, Pune; M/s Brilliant Bio Pharma Private Limited, Hyderabad,
- Developed Classical swine fever cell culture vaccine, which is transferred to M/s Indian Immunologicals, Hyderabad and to Punjab Veterinary Vaccine Institute (PVVI), Ludhiana, Govt. of Punjab.
- Developed Subviral particle based infectious bursal disease vaccine and evaluated at vaccine company M/S Globion India Pvt. Ltd., Hyderabad and the results indicate 100% protection in vaccinated flocks."

2.31. Regarding spread of Foot and Mouth Disease in cattle the representative of the Department stated as given below-

खुर और मुंह की जो बीमारी है बहुत खतरनाक बीमारी है, इसके लिए वैक्सिनेशन होता है। इसका क्या इफेक्ट है, उसको जानने के लिए मोनिटरिंग करते हैं, ब्लड सैंपल लेकर उसकी मोनिटरिंग करते हैं, इफेक्टिव हुआ कि नहीं हुआ? उस कीट का इस्तेमाल करते हुए उसका स्टडी किए हैं और बताया है कि कहां कहां हमारे सोचने की बात है और वैक्सिनेशन सही नहीं चल रहा है, इफेक्टिव नहीं है, कहां इफेक्टिव है, विभिन्न प्रदेशों के लिए हमने किया है।

Availability of quality feed and fodder

2.32. Regarding efforts made by ICAR to augment nutritive value of feed and fodder and availability of quality fodder, the Department in its written reply stated as under-

"Efforts made by ICAR to augment the nutritive value of feed and fodder of livestock at affordable prices during the last five years are as under:

- Nutritive value of alternate protein supplements namely Karanj (*Pongamia glabra*) cake, Neem (*Azadirachta indica*) seed cake and Jatropha (*Jatropha curcus*) meal were improved by detoxification through suitable methods.
- Supplements based on urea molasses and minerals were developed for improving utilization of crop residue based diets.
- Exploration of alternate feed resources like sugarcane press mud and tea seed meal was done as feed supplement for livestock.
- Adoption and propagation of hybrid- Napier varieties like Co-4 and Co-5 was also done to augment availability of fodder for livestock.
- Developed improved feeding strategies for efficient nutrient utilization and use of non-conventional feed resources. These includes:
 - i. Supplementation of fresh *Azolla microphylla* @ 1.5 kg/ animal /day significantly improved the growth rate of crossbred heifer without any adverse effect on animal health.
 - ii. Supplementation of area-specific mineral mixture (KALMIN) @ 2.0 g/day/animal in growing black Bengal goats was beneficial for enhancement of growth and age of puberty.
 - iii. Prilled fat supplementation (75-100 g/d) during transition period and in early lactation increased milk production by 10 and 15 % in crossbred cows and buffaloes, respectively.
 - iv. Rice Condensed Distillers Syrup (RCDS) could replace a part of concentrate mixture in growing as well as lactating crossbred cattle up to 15% (DM basis) without any adverse effect on milk yield, milk composition, TDMI, growth performance, nutrient intake, nutrients utilization and blood parameters."

2.33. The Department further added:-

"In order to meet demand for feed and make quality fodder available to the increasing animal population, the efforts made by ICAR are as under:

- ICAR is utilizing exotic and indigenous genetic resources through breeding and selection for improving the forage productivity and nutritive value of different cultivated and pasture species from different agro-climatic regions in India.
- Fodder crop improvement is being carried out by involves multi-disciplinary integrated approach for development of high yielding varieties. Main fodder crops include cultivated dual purpose

cereal/grain crops, annual legumes, as well as perennial grasses (cultivated/rainfed) and range legumes.

- Developed forage production systems and cropping systems for higher forage yields in different ecosystems,
- Technologies have been generation for establishment, improvement, management and utilization of grasslands/ silvopastures/hortipastures.
- Genetically improved varieties of Berseem, Oat, Cowpea, Guar, Dolichos labab and Grasses have been nutritionally evaluated through in vitro/in vivo trials for the release of quality new forage varieties.
- Screened and identified secondary metabolites like total phenolics and proanthocyanidines have been made in different range shrubs and top feeds. Hence, these range shrubs/ top feeds can be exploited judiciously in the ration of small ruminants for economic goats and sheep rearing.
- Several agroforestry models have been developed for improved fodder availability.
- Optimized the use of Subabul leaf meal in animal feeding for improved fodder availability.
- Work is being carried out on Maringa as quality animal fodder

R&D activities are undertaken for improving the nutritive value, digestibility with cost effective production of feed resources specific to various agro-climatic regions using both conventional and non-conventional inputs / materials for feeding of livestock and poultry. The technologies, thus, perfected are passed on to the end-users including farmers and industries"

2.34. When asked about any research by the Department on use of wastages of vegetables such as Potatoes, Tomatoes etc as feed and fodder for livestock, in its written reply the Department stated the following-

"Use of waste vegetables such as cabbage, radish, including kitchen waste as feed resource for pig for reduction of feed cost has been undertaken. Document developed namely "unconventional pig feed resources" viz. tapioca, moringa, colocasia, bakery waste etc. for inclusion in pig ration by proportionate replacement of ingredients to reduce the feed cost. Nutritive value of locally available ingredients was increased by silage making."

Use of antibiotics in livestock and poultry husbandry

2.35. On the issue of use of antibiotics in livestock husbandry and steps have been undertaken by ICAR to create awareness among farmers regarding use of antibiotics or use of medicated feed, the Department in its written reply submitted as given below-

"Research is being carry out on antibiotic resistance in livestock and creating awareness among farmers, veterinarians and students regarding use of antibiotics through joint collaboration with FAO and CDC sponsored schemes on anti-microbial resistance. Antibiotics or medicated feeds are not used for rearing birds at the Institute farm. The feed formulations developed by ICAR institutes are being provided to the farmers and other stakeholders to create awareness and the same is also deliberated at Institute-Industry interface/Scientist-Farmer Interface time to time. Research on "Medicinal herbs as alternative to antibiotics as growth promoter in chicken" is being under taken, value added feed formulations are being prepared to substitute the antibiotics as growth promoter in rearing of chicken. Research is also being carried out on exploring alternatives to antibiotics i.e. probiotics, prebiotics, sinbiotics (pre and pro biotics in combination), organic assets, essential oils / herbs in poultry."

Improvement of rural poultry

2.36. Regarding research on improvement of rural poultry by ICAR institutes under Animal Science Division on improvement of rural poultry, the Department in its written reply submitted as under-

"ICAR carried out research work on improvement of rural poultry during last five years includes:

- Development of a chicken variety "Srinidhi" with an annual production of 140-150 eggs under rural / backyard system of rearing.
- Developed and released 5 improved backyard poultry varieties namely Pratapdhan in Rajasthan, Kamrupa in Assam, Narmadanidhi in MP, Jharsim in Chhattisgarh and Himsamridhi in HP. These varieties have been developed as per the liking/preference of the local population. The poultry varieties have double the egg production (120-180 eggs per annum) as compared to the local / native variety (50-70 eggs per annum) resulting in additional agricultural income of Rs. 4,000-5,000.00 per annum from 20 number of birds from sale of eggs.
- ICAR supplied more than 57 lakhs improved chicken germplasm to the farmers and other stakeholders across the country.
- ICAR is also maintaining Indian native chicken breeds viz. Aseel Peela, Aseel Kagar, Kadaknath, Nicobari, Ankleshwar, etc. for development and supply of pure and commercial chicks for rural / backyard poultry production.

- Developed dual type improved desi crosses CARI-Nirbheek, CARI-Shyma, UPCARI and HITCARI with an improved egg production of 170-190 eggs and CARI Debendra variety (dual purpose) with an egg production of around 210 eggs and CARI-Sonali (around 280 eggs per year). The germplasm of these rural varieties is being provisioned to farmers across the country."

(ii) Fishery Science

2.37. Under the division, the details of allocations and actual expenditure during the fiscal years 2015-16, 2016-17 and 2017-18 and allocation for the fiscal year 2018-19 at BE stage are given below-

Year	Budget Estimates	Revised Estimates	Actual Expenditure
2015-16	100.00	78.00	76.40
2016-17	100.00	78.00	77.66
2017-18	115.85	115.85	72.59
2018-19	170.69		

(Actual Expenditure upto December, 2017)

During 2018-19, the allocations has been increased to Rs 170.69 crore from Rs.115.85 crore as compared to BE during 2017-18.

2.38. When queried regarding plan of the Department to utilise the enhanced funds, the Department stated as under-

"With the enhanced allocation of funds during 2018-19, it would be possible to procure the proposed equipment and develop infrastructure. It would also help in providing required contingencies for the scientists to undertake planned research programs. Necessary funds can also be provided to two Network Projects on Mariculture and Fish Health, and the Consortium Platform project on Genomics. It would be possible now to implement their work programme effectively. The work plans for different on-going activities have been prioritized on the basis of available funds. Now with the enhanced available funds, it is envisaged that the institute would be able to procure the necessary equipment and complete the research facilities, which would definitely help in envisaged research programmes and ultimately the output. The deferred research activities under different network programmes on Mariculture, Fish Health and CRP on Genomics can be undertaken during the year. Further, it will also greatly support the two new important network research programmes on Antimicrobial Resistance in fish and Ornamental Fish production involving all eight research institutes under the Division, proposed in the SFCs."

2.39. Regarding actual expenditure during the current fiscal, the Department stated that -

"The actual expenditure of the Division up to January, 2018 is Rs 85.97 crore."

2.40. As regards, the steps undertaken by the Institutes under fishery Division to give impetus to fresh water fisheries during the last three years, The Department in its written reply stated as follows:-

"The Division has undertaken number of steps to give impetus to freshwater sector covering riverine fisheries, reservoir fisheries, wetland fisheries and aquaculture in ponds/tanks. These research steps are on i) minimum environmental flow required for the sustenance of ecosystem functions and fisheries of rivers, etc., ii) impact of river linking, designing fish passes/ladders for dams and barrages for ensuring fish migration; iii) developing biomarkers and comprehensive environmental monitoring protocols iv) identification of macro and micro-pollutants and development of pollution map/health chart for the sustenance of rivers; v) protocols for both capture and culture-based fisheries in reservoirs and floodplain wetlands resulted in targeted fish yield reservoirs (140 kg/ha/year) and wetlands (1500 kg/ha/year)."

In pond/tank aquaculture, several epoch-making technologies are in process of development/refinement/implementation: i) protocols of induced breeding and seed production of diversified carp and catfish species; ii) developing several feed formulations and health management tools for sustainable production, diversification water conservation; iii) selective breeding of rohu for growth improvement demonstrated continued higher growth response (17% per generation after 9th generation) iv) selective breeding programmes in another important carp species, i.e. catla; v) growth improvement programme on giant freshwater prawn (showed 3-4% higher growth response after four generations); vi) three pronged aquaculture practices based on different altitudes for cold water sector; vi) extension of coverage area of breeding and culture of rainbow trout from north to north-eastern states with over 1900 raceways and vii) breeding protocols of golden mahseer, chocolate mahseer and endemic few species of snow trouts. Besides, geo-mapping of freshwater resources having area of 0.5 ha have been delineated, protocol for assessment of inland fish production has been developed, and regular field-based training programmes have been conducted for extension of the existing and new technologies.

2.41. Regarding the achievements of the Department in fishery sector during the year, the representative submitted as given below-

फीशरीज सेक्टर में चार नए स्पेशिज ब्रीडिंग और सीड प्रोडक्शन टेक्नोलॉजी किया है जो फिशरीज सेक्टर को डाइवर्सिफिकेशन करने में मदद करेगा। दो ऑनर्मेंटल भी है, दो फुड फीशेज है। इसके अलावा फीस बाजार में आता है, इसमें खासकर फर्मालिन और अमोनिया ज्यादा प्रिजर्वेशन करने के लिए यूज करते हैं, इसका डिटेक्शन करने के लिए किट डेवलप या है। अमोनिया और फर्मालिन का कंटामिनेशन होता है इसको हम डिटेक्ट कर सकते हैं। इसके अलावा, छह डॉयगोनोस्टिक किट बनाया है, जो विभिन्न बीमारियों की पहचान करेगा।

2.42. And regarding efforts made by ICAR to educate and create awareness among fishermen about new and latest technologies in the fishery sector during the last three years, the Department in its written reply stated as follows-

"Institutes under the Division regularly conducted theme based training programmes to benefit fishers, fish farmers, stakeholders and in-service personnel of various state fisheries departments. The topics of training were fisheries and aquaculture of finfish and shellfish breeding, grow-outs, fish feed formulations, fish diseases, harvest and post-harvest and value-addition. The institutes also conducted several awareness programmes, organized exhibitions at district, state and national levels to create awareness among various stakeholders about new technologies."

2.43. On the query regarding contribution of technological advancements in raising the fishermen income during last three years, the Department submitted:-

"Raising of fishers' income is evident from large number of farmers adopting new high income generation technologies developed in recent years. Marine cage farming, cage culture in reservoirs, grow-out production of marine shrimp in inland saline areas, ornamental fish production, etc. are a few examples of these technologies yielding higher profit for the farmers. Besides, a good number licenses have been issued for i) formulation of fish feeds, ii) disease detection kits, iii) neutraceuticals, etc. which would on one hand increase the income of the entrepreneurs adopting these technologies and on the other help in better availability of critical inputs at the doorstep of the farmers, ultimately increasing production and reducing cost of production."

C. AGRICULTURE EXTENSION

2.44. Agricultural Extension Division has mandate of dissemination of available agricultural knowledge and technologies to end users through 11 Agricultural Technology Application Research Institutes, 01 Directorate of Knowledge Management

in Agriculture (DKMA) and one scheme on continuation and establishment of new Krishi Vigyan Kendras (KVKs). Division with network of 681 KVKs in the country, is carrying out on-farm testing of location specific agricultural technology and frontline demonstration to demonstrate the production and protection potential of different crops, livestock, poultry and fisheries. KVKs are imparting training to farmers and extension personnel to update their knowledge and skills and creating awareness on improved technology through extension programs. Major activities of DKMA include knowledge sharing through publication of journals and information dissemination through print and electronic media. In order to facilitate the farmers for enhanced income generation, KVKs organized 4.69 lakh extension programmes, involving 198.67 lakh participants. Launched a new initiative “Pandit Deen Dayal Upadhyay Unnat Krishi Shiksha Yojana” to train farmers in organic and sustainable farming. ARYA (Attracting and Retaining Youth in Agriculture) was in operation in 25 districts of 25 States where 5,000 youth were trained in entrepreneurial activities through KVKs. Under Mera Gaon Mera Gaurav initiative, 10,712 scientists visited villages regularly and provided advisory to the farmers during the year. The details of allocation and utilization of funds under Agriculture Extension Division are as follows:-

(Rs. in crore)

YEAR	BE	RE	Actual Expenditure
2015-16	650.00	660.00	651.73
2016-17	750.00	849.62	814.37
2017-18*	232.51	232.51	165.24
2018-19	241.81		

*Actual Expenditure Upto 31.12.2017

2.45. The Committee note that allocation of funds during 2018-19 for agriculture extension division has only been marginally increased. On being asked about the reasons for this marginal increase and how this would affect the Schemes and Programmes under the division, the Department in its written reply submitted as under:-

"The BE/RE for 2016-2017 included the Grant in Aid-Salary component also. After merging of Plan & non-Plan from 2017-18 onwards the Salaries, TA, Pension and other administrative expenses have been separated out and being provided for under the Non-Scheme component. Rs. 232.00 crore for 2017-18 and Rs. 241.81 crore under BE for 2018-19 are provided for Grant in Aid-Capital & Grant in Aid-General only.

The new programmes shall be initiated keeping in view the budgetary allocation. The horizontal expansion of the activities may have to be re-adjusted in accordance with the budgetary provisions during the year."

2.46. When asked about details of funds to be provided to KVKs, and initiatives such as ATARIs, ARYA, Disaster Management, DKMA etc out of total allocation under Agricultural Extension Scheme, the Department stated as follows:-

"Total fund planned during 2018-19 is Rs.24181.00 lakhs (including ATARI) under Grants-in-Aid Capital and Grants-in-Aid General in KVK Scheme including Rs.2323.36 lakhs for ARYA, Rs.547.00 lakhs for DKMA and Rs. 113.00 lakhs for Disaster Management."

2.47. The frontline extension system as part of National Agricultural Research System of the country has taken up a number of activities through Krishi Vigyan Kendras (KVKs) and other programmes for application of farm technology in farmers' field. Besides taking Uptechology assessment, refinement, demonstration and capacity development programmes during the year, the other initiatives such as Farmers FIRST, Attracting and Retaining Youth in Agriculture (ARYA), Climate Resilient Integrated Farming System (IFS), Cluster Frontline Demonstration of pulses and oilseeds, Cereal Systems Initiatives for South Asia (CSISA), National Innovations on Climate Resilient Agriculture (NICRA), documentation and registration of farmers' varieties under Protection of Plant Varieties and Farmers' Rights Authority (PPVFRA), Pulses Seed hubs, KVK Portal, ATICs, *Mera Gaon Mera Gaurav* and awareness creation about mega government schemes, etc. were also implemented to espouse the cause of farming community through technology application with their active participation.

2.48. As regards, steps undertaken by the Department to augment the resources other than Grants from the Government under the scheme in order to meet infrastructure and manpower requirement for KVKs in the Country, the Department stated in its written reply as under-

"Apart from ICAR grant, the funds have been secured from the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) for creation of infrastructure in KVKs including 1330 soil testing kits, 97 Pulses Seed Hubs and 100 demonstration units on Integrated Farming Systems during last three years. Besides, various types of demonstration units have also been created in 37 KVKs. Funds have also been received for provision of boundary wall-cum-fencing for two KVKs; tube wells/bore wells in five KVKs; furniture and fixtures in three

KVKs; construction of road in two KVKs; and seed store and godown in two KVKs."

2.49. Regarding achievements of KVKs and infrastructure created in KVKs in the country during the last three years, the Department stated in its written reply as under-

"During the last three years, the KVKs, as per mandated activities, conducted 97188 On-farm trials (OFTs) for assessment and refinement of technologies; conducted 3.21 lakh Frontline Demonstrations (FLDs); trained 40.9 lakh farmers including rural youth and farm women; trained 4.48 lakh extension personnel; benefited 392.54 lakh farmers through various extension activities; produced 87900 tonnes of seeds, 1252.42 lakh of planting material and 909.04 lakh of livestock strains and fingerlings; tested 13.36 lakh soil samples; and provided mobile agro-advisories on various facets of agriculture and allied sectors to 395.44 lakh farmers. The details of infrastructure created in KVKs during the last three years include administrative buildings in 45 KVKs; staff quarters in 12 KVKs; farmers hostel in 20 KVKs; renovation of buildings in 15 KVKs; fencing and boundary wall in 12 KVKs; computer and IT infrastructure in 127 KVKs; technology information units in 15 KVKs; office equipments in 94 KVKs; farm equipment in 34 KVKs; furniture and fixtures in 84 KVKs, demonstration units in 63 KVKs; tube wells/bore wells in 37 KVKs; bio-metric machines in 56 KVKs; shed and godown in six KVKs; and replacement of vehicles in 112 KVKs."

2.50. During the evidence, the representative further added:-

वर्ष 2017-18 में 1.83 लाख डेमोनस्ट्रेशन किए हैं, इसके अलावा साढ़े तेरह लाख किसानों को ट्रेनिंग दिए हैं। कृषि विज्ञान केन्द्र के तहत प्लान्टिंग मटेरियल भी बनाते हैं, सीड भी बनाते हैं, सप्लाय भी करते हैं। 147 लाख किसानों तक पहुंचने की कोशिश किए हैं। 1.4 करोड़ किसानों को विभिन्न कार्यक्रमों में लाकर उनके साथ संपर्क में आए हैं, यह बहुत बड़ा एचिवमेंट है।

2.51. On being queried regarding performance analysis of the KVKs during last five years, the Department submitted as under-

"To find out the impact of KVKs on dissemination of improved practices and technologies, in terms of outreach, knowledge, accessibility etc., a study was conducted by the National Institute of Labour Economics Research and Development (NILERD), an autonomous institute under NITI Aayog. The salient findings of the study are as follows:

- On an average each KVK covers 43 villages and 4,300 farmers about 80% of villages covered by KVK are over 10 km away from the KVK.
- Off campus activities are more than on-campus.
- 96% of farmers' requests were attended by KVKs.
- 42% of technologies adopted by farmers resulted in higher productivity.
- On an average each KVK trained about 100 persons annually on agri-preneurship.
- About 25% of the persons trained started self-employment venture.
- KVKs reported an edge over other organizations providing technology services.

A study on "Categorization of KVKs" was also conducted by NILERD with the objectives to develop parameters for the evaluation of KVKs; and to classify KVKs for their performance as A, B, C and D categories. The study revealed that 91 % KVKs are in A & B categories and only 1 percent are in D category. The 33 KVKs of NEH Region are under State Government and overall performance of these KVKs need close monitoring. The reason of KVKs placed under C & D categories may be attributed to vacant staff positions and infrastructure as they are under establishment stage.

2.52. On being asked to furnish a detailed note on achievements, outreach, participation of farmers, outcomes etc for the initiatives such as ARYA, Pandit Deen Dayal Upadhyay Unnat Krishi Shiksha Yojana and Mera Gaon Mera Desh and Sankalp se Sidhi, the Department submitted in its written reply as given below-

"The **ARYA** project was implemented to empower the Youth in Rural Areas to take up various Agri-enterprises in Agriculture, allied and service sector for sustainable income and gainful employment. The project is running in 25 districts of 25 States through KVKs. With the target of 5000 youths, the project has been started. Under this initiative, a total of 3879 rural youth have been trained and 930 different enterprise units related to agriculture and allied sector have been established benefitting 2467 rural youth in the selected districts.

Mera Gaon- Mera Gaurav programme has been initiated to effectively promote direct interface of scientists of ICAR Institutes and State Agricultural Universities with the farmers to hasten the lab to land process. For this, a group of four scientists each is adopting 5 villages. The project is intended to connect with 25,000 villages. At present, agricultural scientists have started providing information on newer technologies to the farmers in 13,500 villages.

Sankalp se Siddhi: “Sankalp Se Siddhi” programmes was organized by 562 Krishi Vigyan Kendras during 19th August to 11 September 2017 in all the states of the country. The total participation of farmers in these events was more than 5 lakhs. VVIPs who participated in these events included, Lok Sabha Speaker, Governors (2), Ministers of Union Cabinet (49), Chief Ministers (3), Speakers/ deputy speakers of State Assemblies (6), Members of Parliament (284), Ministers of various State Government (111), MLAs/MLCs (350), Chairmen District Panchayats (398). The programmes were widely covered in the print and the electronic media.

Pt. Deen Dayal Upadhyay Unnat Krishi Shiksha Yojna scheme was started in 2016 with a budget of Rs.534.925 lakhs under Unnat Bharat Abhiyan . 100 training centers have been started under this scheme in various states. 150 trainings have been conducted by different centers and more than 4500 farmers were trained in Organic Farming/Natural Farming/Cow Based Economy etc. A web portal has been launched illustrating different activities of Unnat Bharat Abhiyan is functioning. The scheme is envisaged to bring changes in rural economy, create awareness of environmental issues, eg. soil health, sustainability and productivity. It will help to rejuvenate the tradition of natural farming.

2.53. Moreover, regarding initiatives undertaken by ICAR or its institutes for empowerment and development of socio-economic status of women farmers under agricultural extension programmes, the Department submitted as under-

"Keeping in view the importance of development of women farmers, it has been made mandatory to have one Subject Matter Specialist of Home Science in every KVK who is responsible for coordinating and organizing different activities related to farm women including livestock rearing, processing & value addition of produces, drudgery reducing interventions, nutria-farming and their empowerment through entrepreneurship development, organic farming and sustainable farming and is a step towards food quality and safety.

D. AGRICULTURE EDUCATION

2.54. Under the head of Agriculture Education, the following are the details of allocations and utilization of funds during 2015-16, 2016-17, 2017-18 (upto 31.12.2017) and allocation at BE stage for 2018-19-

(Rs. in crore)

YEAR	BE	RE	AE
2015-16	780.00	560.00	514.37
2016-17	600.00	650.40	564.73
2017-18	694.66	694.66	211.14
2018-19	725.13		

2.55. It is evident from the above table that allocation at RE stage during 2017-18 was not revised and in spite of no change in allocation, the Department has been able to expend only around 30% of total amount till 31.12.2017

2.56. On being asked to furnish reasons for less utilization of funds, the Department in its written reply explained as follows:-

"As the CCEA note of the Scheme of Agricultural Education Division is yet to be approved, the funds under capital head are not released. The number and amount of Fellowships was enhanced in the scheme "Strengthening and Development of Higher Agricultural education in India. This could not be initiated in 2017-18, as CCEA note is not approved.

Under-utilization of funds has been mainly due to the approval of the SFC/EFCs of the schemes which have made mostly in the latter half of the financial year and CCEA note of the scheme is yet to be approved by the Government. Hence, funds allotted for non-recurring items (works and equipments) could not be utilized. As soon CCEA note is approved, efforts will be made to expend the remaining amount."

2.57. When queried about the proposal of the Department for funds for Agriculture Education Division during the fiscal 2018-19, the Department in its written reply stated as under-

"The proposed funds for the scheme of Agriculture Education Division & its sub-schemes as per CCEA is Rs. 731.22 Crore for the F.Y. 2018-19. However, BE 2018-19 for "Strengthening and Development of Higher Agricultural Education in India is Rs. 619.62 crore as against the proposed outlay in CCEA note of Rs. 682.30 crore."

2.58. Agricultural Education Division, strives for maintaining and upgrading quality, relevance and strengthening of higher agricultural education through partnership with 6 Agricultural Universities, ICAR Deemed-to-be-Universities, Central Agricultural University and Central Universities with Agriculture Faculty by providing support for student and faculty amenities and for holistic development of students. Quality assurance in higher agricultural education is pursued through Accreditation of agricultural universities, their constituent colleges and programmes. ICAR International Fellowship is being implemented for pursuing Ph.D. program at Indian AUs and Overseas Universities for Indian & overseas candidates, respectively, to develop competent human resource and showcasing the strengths of Indian ICAR-AUs system.

2.59. When asked regarding the institutes under ICAR bestowed with Deemed-to-be University status, the Department in its written reply stated as under:-

"Four institutes under ICAR are bestowed with Deemed-to-be University status and these are:

- Indian Agricultural Research Institute
- Indian Veterinary Institute

- National Dairy Research Institute

- Central Institute of Fisheries Education

Few institutes like Indian Institute of Horticultural Research, Bangalore and Central Institute of Agricultural Engineering, Bhopal proposed for Deemed-to-be University status. These institutes could not be considered because of Para 5.1 of UGC (Institutions Deemed to be Universities) Regulations 2010 which states that "the proposed institutes shall be registered either as a not-profit Society under the Societies Registration Act or as a not-for profit Trust under Public Trust Act."

2.60. On being asked regarding mechanism to evaluate and monitor the quality and progress of research works being carried out in the Agriculture Institutes/Universities in the country by ICAR, the Department informed as under-

"There exists a mechanism to evaluate and monitor the quality and progress of works being carried out in the agricultural universities, as under-

- a) Annual reports highlighting the achievements under each sub-head from the Universities

- b) Regular visits by ICAR officials

- c) ICAR Nominee in Board of Management

- d) Annual meets of the Comptrollers, Nodal Officers, Experiential Learning Coordinators, Librarians

- e) Annual Vice Chancellors' Conference

- f) Periodic Meetings of Deans

- g) Internal review Committee for monitoring the progress of Niche Area of Excellence

- h) Annual review Meetings of Niche Area of Excellence

- i) Dynamic data management by NISAGENET
- j) Evaluation of Effectiveness and Training Transfer of Capacity building Programmes at NARS.
- k) Accreditation of the University for Quality Assurance and maintenance of standards.

Further, external independent committees (% committees, Zone wise) were constituted to review the utilization of the grants in XII plan and the final report of the Committee is likely to be submitted shortly. At institute level. It is done by Project Monitoring and Evaluation (PME), Quinquennial Review Team (QRT), Research Advisory Committee (RAC)."

2.61. Regarding new Institutes under ICAR proposed to be established during last five fiscal years, the Department stated as under:-

"The following 4 institutes have been proposed to be established during last Five fiscal years:

1) Indian Agricultural Research Institute, Assam has been established with an amount of Rs. 159.29 crore. Foundation stone was laid down by Hon'ble Prime Minister on 26th June, 2017. This is an ongoing activity.

2) Indian Agricultural Research Institute, Jharkhand has been established with an amount of Rs. 200.78 crore. Foundationstone was laid down by Hon'ble Prime Minister on 28th June, 2015. This is also an ongoing activity.

3) National Institute on Integrated Farming, Motihari has been established with an amount of Rs. 30.00 crore on 3rd August, 2015. This is also an ongoing activity.

4) Regional Centre under ICAR- Central Institute of Freshwater Aquaculture, Bhubaneswar has been established in Bathinda, Punjab with an amount of Rs. 10.00 crore during 2015-16

5) National Institute of High Security Animal Diseases, Bhopal has been established by upgrading regional station of High Security Animal Diseases Lab with an amount of Rs. 17.80 crore during XII th Plan"

National Higher Education Project (NAHEP)

2.62. During the fiscal 2018-19, National Higher Education Project (NAHEP) has been allocated Rs.7.89 crores at BE stage. On being asked to furnish details regarding the functions and implementation of project, the Department in its written reply submitted as follows-

Functions and Implementation of NAHEP

"The current ICAR-Agricultural Universities (AU) System reform agenda requires global knowledge and international expertise to refine

its approach and implementation. For this reason, ICAR has requested World Bank support as a knowledge adjunct to the proposed NAHEP. The challenges faced by AUs mirror those faced in general by higher education in India. The needs of the agricultural sector resonate with other sectors, i.e., highly trained workforce and relevant cutting-edge research. Two World Bank Global Practices – Agriculture and Education – are collaborating on the proposed NAHEP to ensure that the AU reform process benefits from innovations in both sectors across India and internationally. Through strategic priority interventions at the Central and State levels, the proposed NAHEP would have far-reaching and long-term impacts on agricultural higher education in India.

Project Objective

The objective of the Project is to support Participating Agricultural Universities and ICAR in providing more relevant and higher quality education to Agricultural University students.

Long-term Objectives

The Project supports the Country Partnership Strategy and addresses the three engagement areas of integration, transformation and inclusion. These engagement areas foresee increased agricultural productivity and support quality improvements of higher education to create a more skilled workforce that continuously improves the productivity of key sectors, including agriculture. The proposed Project is also a multi-Global Practice collaboration (Agriculture and Education) and is expected to support activities and results directly related to cross-cutting strategic areas of climate change, jobs and gender. Project Components

- **Component 1** – Support to Agricultural Universities, **Sub-component 1a** - Institutional Development Plans (IDPs); **Sub-component 1b** – Centre of Advanced Agricultural science & Technology (CAAST); **Subcomponent 1c** – Innovation grants(IG)
- **Component 2** – Investment in ICAR Leadership in Agricultural Higher Education .
- **Component 3** – Project Management and Learning

Project Beneficiaries

- *Students* would benefit from: (a) a movement from teaching-to learning-centered education, leveraging ICT and external partnerships; (b) piloting effective stakeholder participation in curricula development, pedagogy options and course evaluation; (c) increased equity in educational access through vocational and technical certificate programs; and (d) an overall improvement in the learning and academic environment that would both expand and sharpen their skill set needed for future employment.
- *Faculty* would benefit from: (a) increased collaboration among Indian AUs and with other universities globally to raise research quality and its

linkage to educational quality and relevance; and (b) training and capacity-building to improve the delivery of education and its learning outcomes.

Fund status

In NAHEP there was no separate allocation of fund during 2017-18 at BE/RE stage, however Rs 5.0 crore was marked from the budget of Education division at BE Stage. So far the said amount has not been utilized.

2.63. Further, during the course of examination, the representative of the Department stated as under-

एक नया प्रोग्राम नेशनल एग्रीकल्चर हायर एजुकेशन प्रोजेक्ट को जून में शुरू किया है। नए प्रोजेक्ट का उद्देश्य यह है कि हमारे डीम्ड यूनिवर्सिटीज हैं, स्टेट एग्रीकल्चर यूनिवर्सिटीज हैं और इनमें बाहर जो अच्छे-अच्छे यूनिवर्सिटीज हैं, उनसे संपर्क रहेगा, इससे फैकल्टी अपग्रेडेशन होगा, स्टूडेंट का जो क्वालिटी है और कैसे स्टूडेंट्स के क्वालिटी में गुणवत्ता होगा, इसके अलावा नए-नए फैसिलिटी देकर जो एक्रेडिटेटेड नहीं हो पाए, उन्हें भी सपोर्ट कर सकते हैं। नए-नए प्रोग्राम फ्रंटियर एरियाज ऑफ रिसर्च में सपोर्ट देते हुए कैसे ह्यूमन रिसोर्स को डेवलपमेंट कर सकते हैं, उस दिशा में भी कदम उठाएंगे। एक रीजनल कमेटी एक्रेडिटेशन बोर्ड था, उसका रीजनल सेंटर भी बनाया हुआ है ताकि हर रीजन में उसकी मोनिटरिंग हो, एक्रेडिटेशन की क्वालिटी का आश्वासन है वह भी सुनिश्चित हो।

E. MANAGEMENT OF NATURAL RESOURCES

(i) Agricultural Engineering

2.64. The Machinery to enhance productivity and profitability of different farming system, need-based and region-specific mechanization of production and post-production, and energy management technologies have been developed. These include improved machinery for efficient farm operations, resources conservation, processing; renewable energy technologies; gender-friendly and drudgery reducing

tools for women farm-workers; efficient utilization of animal energy for enhancing farmers' income.

2.65. Under the head of Agricultural Engineering, there has been substantial increase in allocation for 2018-19 at BE stage which is 57.4% of allocations made at BE Stage during the year 2017-18. The details of status of allocation and utilization of funds are as follows:-

(Rs. in crore)

YEAR	BE	RE	AE
2015-16	90.00	82.00	80.79
2016-17	100.00	78.00	77.01
2017-18*	42.68	42.68	26.46
2018-19	100.00		

2.66. On being asked regarding reasons for enhancement of allocation at BE stage during 2018-19, the Department in its written reply stated as under-

Many important projects and activities planned earlier will be implemented. The research in the following advance areas will be undertaken:

- Image based herbicide application system
- Image based nitrogen recommendation system for top dressing in rice/wheat crops
- Spraying system based on ultrasonic sensors
- Micro-controller based seed-cum-fertilizer drill
- Automated control system for tractor-Implement combinations
- Robotic precision planter
- Coconut plucking robot
- Vegetable transplanter with robotic arm for metering of pot seedings
- Seed-cum-fertilizer drill for two stage placement of fertilizer
- Electrical conductivity and soil pH mapping machine
- Multipurpose hydraulic platform for orchard management
- Online grading system for fruits

- On-line non-destructive quality assessment
- Application of electro-magnetic waves based technology for drying and disinfestations of grain, pulses and seeds for safe storage.
- Extraction of pectin from apple pomace
- Extraction of protein from oil seed cake

Enhanced allocation at BE stage during 2018-19 will enhance pace of implementation of schemes and research activities as mentioned above.

2.67. When asked about major new research works undertaken by the institutes under the Agricultural Engineering Division during last three years, the Department in its written reply submitted as follows: -

"Following two major new research works undertaken by the institutes under the Agricultural Engineering Division during last three years;

- 1) Five new Consortia Research Projects were initiated:
 - a) Farm Mechanization & Precision Farming
 - b) Energy in Agriculture
 - c) Secondary Agriculture
 - d) Health Foods
 - e) Natural Fibres
- 2) One All India Network Project on "Conservation of Lac Insect genetic Resources"

Due to limited funds availability these projects were started at 4-5 centres only with limited activities. The progress is satisfactory."

2.68. When asked about the efforts made by the institutes under Agricultural Engineering for development of small, effective and economical agricultural implements that can be useful for small and marginal farmers in the country and the details of agricultural implements developed by the institutions during the last 5 years, the Department stated as follows:-

"The development and 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.

The detail of agricultural implements developed by the institutions during the last 5 years is given in **Annexure-VI.**"

2.69. During the evidence, the representative of the Department further added:-

छोटे खेत के लिए आपने पिछली बार भी बताया था, इस बार भी बताया है। यह एक बहुत बड़ी समस्या है। लेकिन बाहर देश में जैसे जापान और चाइना में भी छोटे खेत हैं। उसके लिए हमारा प्रयास है कि किस तरह से उसका मैकेनाइजेशन हो और कम खर्च में किसान यांत्रिकरण कर सकता है।

2.70. In its written reply, regarding efforts made to promote custom hiring of farm equipment and machinery and create employment opportunities in the rural sector, the Department elaborated as under:-

"During 2012-13 to 2017-2018 (up to Jan 2018), a total number of 1208 rural youth entrepreneurs have been trained at ICAR-CIAE, Bhopal for taking up the custom hiring entrepreneurship in the area of farm mechanization. Out of that 1000 entrepreneurs have set up their Custom Hiring Centres by availing loan from banks. The net average annual income of these centres is in the range of Rs. 3 to 4 lakhs and most of these centres employ 3-4 local youths and thus facilitate local employment generation.

The average initial investment by the entrepreneurs is Rs. 18-25 lakhs. Machinery usage has been found to be varying between 500-1400 h. The tractors commonly being used by custom hiring operator are of 35-

60 hp. Machines Available through custom hiring centres for different farm operations of production agriculture are given below:

Tillage	:Rotavator, Cultivator, Reversible MB Plough
Sowing	: Seed-cum-ferti drill, Zero Till Drill, Raised Bed, Crop Specific Planters
Inter-culture	: Narrow Tyre Tractors & Small Tractors
Plant Protection	: High Capacity Boom Sprayers
Harvesting	: Reaper and Reaper Binder
Threshing	: High Capacity Thresher for all crops
Straw management:	Straw Reaper

2.71. During evidence, the representative of the Department elaborated the achievements of the Department in this field as follows:-

इंजीनियरिंग में भी दस अलग-अलग नए टेक्नोलॉजी लाए हैं जो कॉटन का फाइबर वेस्ट होता है, उसका इस्तेमाल करते हुए करेंसी नोट छापने के लिए इस्तेमाल हो सकता है हम सब्सिड्युट कर सकते हैं। इसके अलावा ब्लेन्डिंग करते हुए जैसे जूट, बनाना फाइबर मिलाते हुए, इस तरह का फाइबर बना सकते हैं, करेंसी ग्रेड पेपर बनाए हैं।

हमने करेंसी ग्रेड पेपर बनाया है, वह फुलप्रूफ होगा, अगर कोई आदमी कॉपी करना चाहेगा तो उसे दिक्कत होगी। हम सरकारी प्रैस के साथ मिलकर इस काम को आगे बढ़ा रहे हैं।

अरुणाचल प्रदेश और जम्मू-कश्मीर में ज्यादातर याक पाए जाते हैं, इनमें जो फाइबर होता है, वह ज्यादातर इस्तेमाल नहीं हो पाता है। इसे लोकल स्तर पर

इस्तेमाल किया जाता है या कम इस्तेमाल होता है। इसे कमर्शियल स्तर पर इस्तेमाल करने के लिए जूट और कॉटन के साथ ब्लेंडिंग किया है। हमने 40 परसेंट याक फाइबर, 30 परसेंट जूट फाइबर और 30 परसेंट कॉटन फाइबर मिलाते हुए शाल और जैकेट बनाई हैं। इसकी आर्मी द्वारा हाई एल्टीट्यूड में टैस्टिंग भी की है कि यह कितनी गर्मी देती है। यह बहुत गर्मी देती है।

इसे वैज्ञानिक पद्धति से बनाया गया है। टैस्टिंग से यह पाया गया है कि यह आर्मी के जवानों लिए अच्छा साबित होगा। हम इसे लार्ज स्केल पर बनाने की कोशिश कर रहे हैं। हम चाहते हैं कि इसकी वैल्यू चेन बन जाए ताकि याक रखने वाले किसानों को बेकार जाने वाले मैटीरियल से फायदा मिल सके।

(ii) Agro forestry Research

2.72. The funds allocated and utilized for Agro-forestry Research under NRM Division during the last three years:

(Rs. in Lakhs)			
Year	Institute/AICRP	Funds Allocated	Actual Utilization
2015-16	Central Agroforestry Research Institute	257.82	253.17
	AICRP on Agroforestry	1307.20	1304.40
2016-17	Central Agroforestry Research Institute	250.00	249.70
	AICRP on Agroforestry	1135.00	1025.25
2017-18	Central Agroforestry Research Institute	1172.00	783.05*
	AICRP on Agroforestry	1326.00	984.02*

*Upto January, 2018

2.73. And, the funds proposed for allocation under Scheme Budget for Agro-forestry Research under NRM Division for year 2018-19 are:

(Rs. in lakhs)

Year	Institute/AICRP	Proposed Budget
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		Estimates
2018-19	Central Agroforestry Research Institute	390.0
	AICRP on Agroforestry	357.0

2.74. On being asked about the major research works undertaken by the Department during the last three years, the Department informed as under:-

- a) "Develop sustainable agroforestry practices for farms, marginal land and wastelands in different agro-climatic zones of India
- b) Development of agroforestry technologies integrating livelihood option including value addition and income generation for small holders.
- c) Tree improvement and multiplication for important agroforestry tree species with emphasis on indigenous species.
- d) Watershed development and management involving agroforestry for climate resilient.
- e) Transfer of agroforestry technology in various agro climatic zones
- f) Assessment of Carbon Sequestration under Agroforestry
- g) Agroforestry Mapping through Remote Sensing

Technologies generated in agroforestry research are:

- Developed superior genotypes and clones of Poplar, Eucalyptus, Shisham, Neem, Acacia and others,
- Designed and developed agroforestry models for different agro-climatic zones of the country.
- Developed agroforestry based watershed interventions to help in drought proofing with enhanced and sustained rural livelihood.
- Developed carbon sequestration potential of agroforestry.
- Developed application of GIS and RS techniques for calculating area under agroforestry.

National Agroforestry Policy 2014

Rising demand for food and wood products is the basic livelihood need which can be met by following agroforestry practices. Agroforestry is now recognized as an important part of the evergreen revolution movement in the country. In addition agroforestry has got the potential to reverse land degradation, sequester carbon and recover site productivity through interactions among trees, soil, agricultural crops and livestock and thus restore environment and enhance the productivity. In order to promote and realize the benefits of agroforestry, the Government of India launched National Agroforestry Policy (NAP) in 2014 with the following objectives:

Objectives

The major objectives of the National Agroforestry Policy are to:

- Encourage and expand tree plantation in integrated manner with crops and livestock to improve productivity, employment, income and livelihoods of rural households, especially the small holder farmers.
- Protect and stabilize ecosystems, increasing forest/tree cover and promote resilient cropping and farming systems to minimize the risk during extreme climatic events.
- Meet the raw material requirements of wood based industries. Supplement the availability of agroforestry products such as the fuel-wood, fodder, non-timber forest produce and small timber of the rural and tribal populations, thereby reducing the pressure on existing forests.

The policy is not only crucial to India's ambitious goal of achieving 33 per cent tree cover but also to mitigate GHG emissions from agriculture sector. The NAP 2014 has the potential to substantially reduce poverty in rural India by creating employment in wood based industry, providing livelihood opportunities, help in conservation of natural resources and mitigation of climate change effects."

2.75. Regarding contribution of ICAR on development of Agroforestry models for livelihood, the Department in its written reply stated as under-

The AICRP on Agroforestry has developed 35 agroforestry models and other suitable technologies for different agro-climatic zones of the country. The agroforestry models and technologies are documented in the form of a bulletin which is available on website of CAFRI at the following link http://www.cafri.res.in/AFTransferable_Technologies.pdf.

CHAPTER- III

FOCUS AREAS

A. DOUBLING FARMERS INCOME BY 2022

3.1. The Government of India in its annual budget of 2016-17, for the first time, has indicated a change in policy stance from excessive emphasis on food production towards improving farmers' income, and has set a target of doubling it by 2022. Identification of farmers and their locations are important to target the efforts and investments accordingly. Three-fourths of the farmers lie at the bottom of land as well as income distribution, and a majority of them are located in the eastern, central and western regions that are generally deficit in infrastructure, institutions and human capital. There are prospects of income growth in farming sector through reduction in inefficiency in input use production, raising cropping intensity and diversification of portfolio in favour of high-value, high-growth enterprises, viz. horticulture and animal husbandry. Harnessing their potential would require improving farmers' access to information on modern technologies and agricultural practices, and to institutional credit and remunerative markets. It is essential to improve complementarities of infrastructure and institutions as the lack of any one of these, may deprive farmers of the benefits of investments in others. The doubling of farmers' income requires initial or benchmark set of estimates regarding the income which are doubled to be in given time-frame. Nonetheless, in the long-run sustainable improvements in farmers' welfare will critically be determined by the pace of transfer of labour from agriculture to non-agricultural sector. The implication is that if the constraints due to ubiquitous small-holdings were to be mitigated, strategies for broad-based growth of rural nonfarm sector would be required.

3.2. On being asked regarding role of ICAR in national mission of doubling the farmer's income and making agriculture a remunerative socio economic activity, the Department in its written reply stated as under-

"ICAR is actively participating with Government's national mission of doubling the farmers' income in collaboration with sister departments through technological, skill development, propagation of critical inputs and various service interventions to increase farm level production and productivity.

In order to facilitate the farmers for enhanced income generation, DARE/ICAR has taken following steps: -

- Issued 1.65 lakh Soil Health Cards to the farmers.
- Total of 6.00 lakhs day old / 6 week old and hatching eggs of poultry and 4245 piglets were provisioned to poultry/pig farmers and government agencies.
- Training programs were organized for skill upgradation of various categories of participants (youth, women, entrepreneurs, etc.) for dairy production and veterinary services.
- Appropriate soil- and- crop management practices were developed for conjunctive use of fresh and saline water in irrigation to make Per Drop More Crop a success.
- Organized 4.69 lakh extension programmes, involving 198.67 lakh participants for creating awareness among farmers about all the efforts being made to improve the condition of rural India.
- Launched a new initiative “Pandit Deen Dayal Upadhyay Unnat Krishi Shiksha Yojana” to train farmers in organic and sustainable farming. Krishi Vigyan Kendra (KVKs) play important role in frontline extension system in the country for technology assessment, demonstration and capacity building under different farming situations across the country.
- During 2016-17, 20 new KVKs were established taking the total number of KVKs to 669 in the country.
- To realise Digital India vision in agriculture sector, the farmers now have access to web-based ‘KVK Portal and KVK App,’ mobile based ‘Kisan Mobile Advisory –KMA’ SMS portal, ‘toll free help lines’, ICAR data Centre and mobile apps for different commodities.
- Attracting and Retaining Youth in Agriculture (ARYA) is a project launched by the Council in 25 districts of 25 States to train 5,000 youth in entrepreneurial activities through KVKs.
- Under Mera Gaon Mera Gaurav initiative, 10,712 scientists visited villages regularly and provided advisory to the farmers during the year.
- Developed 99 of model agricultural land use plans(LUP) for growing crops that are suitable to a given agro-ecological situation so as to raise crop productivity and minimize risk of farming.
- In order to reduce risk in farming and to enhance farm productivity, profitability and livelihood of resource poor farmers, 45 location specific Integrated Farming System (IFS) models for different agro-

ecological zones with systematic integration of crop, livestock, dairy, horticulture, fisheries, agroforestry.

- 45 organic farming package of practices for dominant crops and cropping systems to enhance farmers' income, which are being promoted under *Parampragat Krishi Vikas Yojana* (PKVY).
- Demonstrated climate resilient technologies in 153 model NICRA villages under KVK covering 23 states under "National Innovations on Climate Resilient Agriculture".
- 623 district contingency plans are in place for preparedness and real time implementation in the events of weather aberrations and extreme climatic events.

Apart from above, in order to further boost the efforts towards doubling farmers' income by 2022, the ICAR has also constituted the State level Committees. These are called State-wise Coordination Committees (SCCS). The constitution of the each committee and its assignment will be as under:

The Vice-Chancellor of one of the Agricultural Universities in the state as the Chairman and one of the Directors of ICAR Institutes /ATARIs, as the convener of the committee. All the other Vice-Chancellors and the ICAR Directors, Director of ATARI of the concerned region, one nominee of DAC&FW, DAHDF, Ministry of Food Processing Industries and Ministry of Water Resources as well as the senior representatives of the concerned State Department of Agriculture as the members of the committee. Senior representatives from CGIAR system and commodity boards and the farmers' organizations, have also been co-opted as additional members in some of the committees as per requirement. The committees have been assigned the task of developing the comprehensive strategy documents on doubling farmers income by 2022 for their respective states including existing productivity and income levels of the farmers in the respective states. Interventions to be worked out to double the income of farmers by the year 2022. Recommendations to be formulated on the implementation of the action plan and its monitoring and midcourse corrections to be brought out. The SCCs have been requested to focus on the strategies and technologies suitable for the particular agro ecological regions of their respective states and maintain constant liaison with the various stakeholders and the implementing agencies in the state and central level."

3.3. Regarding contribution of the Department in doubling farmers income, the representatives of the Department submitted before the Committee as under:

यहां डबलिंग फार्मर्स इनकम की बात हो रही थी। हमने इस दिशा में कदम उठाए हैं। हमारी सब प्रदेशों में युनिवर्सिटीज हैं। वाइस चांसलर की चेयरमैनशिप में कमेटी बनाई है, इसमें बाकी युनिवर्सिटीज के वाइस चांसलर, राज्य सरकार के विभिन्न विभागों के सैक्रेट्री और डायरेक्टर, केंद्र सरकार के रिलेवेंट डिपार्टमेंट के अधिकारी और आईसीएआर के अधिकारियों की कमेटी बनाकर विस्तार रूप से चर्चा की गई है और इसके लिए हर प्रदेश के लिए स्ट्रेटजी बनाई है। कुछ प्रदेशों का स्ट्रेटजिक डॉक्युमेंट छप चुका है और बाकी का छप रहा है, लेकिन इसे इम्प्लीमेंट किस तरह से किया जाएगा, यह बहुत बड़ी समस्या है। हमने इस दिशा में एक कदम उठाया है, हम उत्तर प्रदेश में डीसीएम श्रीराम कंपनी और चार चीनी मिल्स को साथ लेकर आठ गांवों में टार्गेटिड वे में प्लानिंग करके इम्प्लीमेंटेशन कर रहे हैं कि 2022 तक किस तरह से हर किसान की आमदनी दुगनी कर सकें। इसमें सब इकोनामिस्ट इन्वाल्व हैं, स्कीम बन गई हैं और इम्प्लीमेंटेशन शुरू हो गई है। यह एक उदाहरण होगा कि प्राइवेट को साथ लेते हुए शुगरकेन किसानों और शुगरकेन बैस्ट फार्मिंग सिस्टम को साथ लेते हुए किस तरह से आमदनी दुगनी कर सकते हैं। यूपी एक उदाहरण है, हम इस तरह से हर राज्य में इम्प्लीमेंट कर रहे हैं। जब उदाहरण रेप्लीकेट होंगे तो बहुत फायदा होगा।

हमने जो डॉक्युमेंट बनाया है, उसमें यह स्टडी की है कि तकनीकी गैप कहां है और इसे किस तरह से ब्रिज कर सकेंगे। आमदनी सिर्फ तकनीक से दुगनी करना संभव नहीं है, हम देखना चाहते हैं कि किस तरह बाजार से जोड़ें और वैल्यू चेन बनाएं ताकि उनकी आमदनी दुगनी हो। हम पूरा प्लान बनाकर आगे बढ़ रहे हैं। मैं समझता हूँ कि अगर राज्य सरकार का सहयोग रहेगा, तभी यह संभव हो सकता है।

B. MAINSTREAMING OF WOMEN IN AGRICULTURE

3.4. As per the Economic Survey 2017-18, with growing rural to urban migration by men, there is 'feminisation' of agriculture sector, with increasing number of women in multiple roles as cultivators, entrepreneurs, and labourers. Globally, there is empirical evidence that women have a decisive role in ensuring food security and preserving local agro-biodiversity. Rural women are responsible for the integrated management and use of diverse natural resources to meet the daily household needs (FAO, 2011).

This requires that women farmers should have enhanced access to resources like land, water, credit, technology and training which warrants critical analysis in the context of India. In addition, the entitlements of women farmers will be the key to improve agriculture productivity. The differential access of women to resources like land, credit, water, seeds and markets needs to be addressed. Towards this, Government has been implementing various schemes which help improve the entitlements of women farmers, which will prove to be advantageous in bridging the policy gaps which exist in the sector. The following measures have been taken to ensure mainstreaming of women in agriculture sector: Earmarking at least 30 per cent of the budget allocation for women beneficiaries in all ongoing schemes/ programmes and development activities, Initiating women centric activities to ensure benefits of various beneficiary-oriented programs/schemes reach them, Focusing on women self-help group (SHG) to connect them to micro-credit through capacity building activities and to provide information and ensuring their representation in different decision-making bodies. Recognising the critical role of women in agriculture, the Ministry of Agriculture and Farmers Welfare has declared 15th October of every year as Women Farmer's Day.

3.5. ICAR-Central Institute for Women in Agriculture (ICAR-CIWA), a prime research institute, has the mandate of carrying out research exclusively on gender issues in agriculture. The outputs in the form of gender related information, knowledge and model have the potential of benefiting different stakeholders including farm women.

3.6. For improvement of nutrition and livelihood of farm women emphasis have been on development of sustainable production systems like, integrated farming system for farm women under different agro-ecosystems for rural households. Different projects have been taken up for reducing operational drudgery and increasing efficiency of farmwomen. Under the project 'Characterization of drudgery of women in the production environment and assessment of technology packages in mitigating drudgery, drudgery of women was characterized for three crops and five production systems in the operational villages. The results indicated how location and factors impacted drudgery in production system.

3.7. When asked about steps undertaken by ICAR for empowering women in agriculture for their economic betterment and livelihood security, the Department in its written reply submitted as under-

Farm women empowerment:

- 300 farm women were trained for preparation of diversified products of jute
- Developed package of safety gadgets/practices for women working in cashewnut processing activities,
- Gender friendly workplace layout has been developed along with control locations for female workers.
- Organized training on manufacturing of garments from jute-yak blended fabric
- Conducted 725 on- farm trials and 5502 frontline demonstrations in the field of women farmers; provided training to 1.07 lakh women farmers and 6799 extension personnel. Besides, large number of extension activities was also organized in order to create awareness among 7.58 lakh women farmers. In addition, the KVKs also produced 162.75 tons seeds, 3.97 lakh planting materials and 18696 livestock strains and finger lings for availability to women farmers and provided Kisan Mobile advisory to 55.28 lakh women farmers.
- Project on Gender in Agriculture Partnership (GAP) has been initiated to create a platform for discussion and finding pathway for involvement of farm women in agriculture to improve the agricultural productivity and livelihood opportunity.
- ICAR trained 350 women researchers/ teachers in various programmes, which account for 22% of total participants.
- 20 farm women were educated for a period of one year on every Friday and Saturday for dairy production and technology.
- Capacity building of 90 farm women in preparation value added milk products;
- Capacity Building of 62 farm women on Preservation of Fruits and Vegetables;
- Capacity Building of 22 Farm-women in Scientific Dairy Farming,
- Imparted training and skill development to women artisans on sheep rearing and wool processing.
- A special programme for rural women artisan was organized for skill improvement on wool processing and development of handicrafts, to improve their livelihood and profitability.
- 152 exposures visit to the institute for 1127 women farmers was also carried out.

- Two training cum awareness camp organized in camel husbandry where 19 women of Ladakh were benefited,
- 18 farm women were trained on nutrition and fodder production for small and large animal,
- 14 farm women were trained on azolla and vermi-compost production,
- 37 farm women were trained for scientific dairy farming - trained 37 farm women
- Several FMD awareness programmes were organized in which tribal women participated and were benefited by gaining knowledge about scientific rearing techniques.

3.8. Moreover, regarding initiatives undertaken by ICAR or its institutes for empowerment and development of socio-economic status of women farmers under agricultural extension programmes, the Department submitted as under-

"Keeping in view the importance of development of women farmers, it has been made mandatory to have one Subject Matter Specialist of Home Science in every KVK who is responsible for coordinating and organizing different activities related to farm women including livestock rearing, processing & value addition of produces, drudgery reducing interventions, nutria-farming and their empowerment through entrepreneurship development.

PART-II

OBSERVATIONS/RECOMMENDATIONS OF THE COMMITTEE

ALLOCATION AND UTILISATION OF FUNDS

1. The Committee note that the budgetary allocation for the Department of Agricultural Research and Education for fiscal year 2018-19 has been substantially enhanced from Rs. 6800 crores during 2017-18(BE) to Rs. 7800 crores. The total Demand for 2018-19 under Scheme and Non-Scheme Heads together is Rs. 7800.00 crore as against proposal of Rs 8380.92 crore. Out of total allocation for 2018-19, Rs. 2914.77 crore is under the Scheme Head and Rs. 4885.23 crore under the Non-Scheme Head. The Committee note that the allocation at RE stage for Non-Scheme head during 2017-18 was increased from Rs. 4633.54 crore to Rs 4825.54 crore during 2017-18 whereas there was no change for Scheme head which remained as Rs.2166.46 crore. The Committee have been informed that the actual expenditure under Scheme Head is Rs. 1078.81 crore up to 31.12.17.

The Committee observe that despite no change in allocation of funds at RE stage during 2017-18 for Scheme Head, the actual expenditure of the Department was only around 50% upto December 2017. The Committee have been informed the reasons for less expenditure are that the termination of XIIth plan during 2016-17 and subsequent formulation, processing and approvals of SFC/ EFCs for next phase i.e. 2017-18 to 2019-20 took substantial time. The process of approvals of SFC/EFC for the next phase completed by September-October, 2017, which is the main reason for low expenditure during first three quarters of current financial year. Recognising the importance of agricultural research, education and extension for agriculture growth and development in the country, the Committee in its earlier reports have been emphasizing on the need for increase in allocation to DARE. The Committee are happy to note that

the allocation has been substantially enhanced for 2018-19. However, the Committee feel that mere enhancement is not suffice, rather optimal utilization of funds is more important because non-utilization of funds defeats the very purpose of enhancement. The reasons cited by the Ministry for under-utilization of funds during the year 2017-18 are administrative and procedural which could have been easily avoided with proper planning and foresight. The Committee, therefore, recommend that the Department should realistically assess its requirement of funds and seek funds only on the basis of this assessment and closely monitor expenditure so that situation of large amount of funds remaining unutilized at the end of the financial year can be avoided.

PROPORTION OF BUDGETARY ALLOCATION VIS-A - VIS CENTRAL OUTLAY

2. The Committee note that the proportion of budgetary allocation of the Department was 0.30% of total Central Plan Outlay in 15-16, 0.31% in 2016-17 and 0.32% in 2017-18. The Department has informed that the budgetary allocation for the year 2018-19 is Rs. 7800.00 crore which is also 0.32% of total Central Plan Outlay as against the proposed amount of Rs 8380.92 crores for the fiscal year 2018-19. The Committee have also been informed that the proportion of budgetary allocations made in favour of Department out of total budget of the Government during the last three fiscal years are much less as compared to the Ministries/Departments like Higher Education, Food & Public Distribution and Fertilizers. The Committee note that for the last three fiscal year the proportion of budgetary allocation of the department is more or less same. While noting the increase in allocation for 2018-19, the Committee are of the opinion that this increase is just incremental and falls way short of what the agriculture research, education and extension actually needs. The Committee urge the Department to impress upon the Ministry of Finance to

allocate funds to them as per their requirement at RE stage so that agricultural research , education and extension do not suffer for want of funds.

CROP SCIENCE

3. The Committee note that improvement of crops is the mandate of Crop Science Division. The main emphasis of the Division has been on development of trait-specific high yielding crop varieties and hybrids. During 2017-18 a total 209 including 13 bio-fortified, new varieties/hybrids tolerant to various biotic and abiotic stresses with enhanced quality have been developed for Cereals, Pulses, Oilseeds, Commercial and Forage crops. The Committee have been apprised that in order to enhance productivity and improve farmers income in the country, ICAR Institutes under crop science division in collaboration with SAUs are conducting basic and strategic research related to improvement and production of rice, wheat, maize, millets, fodder crops, oilseeds, pulses, sugarcane, cotton and other fiber crops through 26 commodity based research institutes and 32 All India Coordinated Research Projects (AICRPs) and All India Network Projects (AINPs to develop location specific crop varieties and matching technologies as per the agro-ecological needs. Newer approaches like millets for diversification of food basket and nutritional security, terminal heat tolerance in wheat, improved rice hybrids and basmati varieties, quality protein maize hybrids with better adaptability, tobacco seed oil for edible purpose, high sugar varieties with novel research methodology for better sugar recovery from sugarcane, well adapted high yielding oilseeds and pulses for better nutrition, high strength cotton genotypes and high density planting system for cotton besides

enhanced fibre quality in jute and allied fibres are other areas that have received attention.

While appreciating the work done by this Division, the Committee feel that a lot still remains to be done. Often the quality of seeds which actually reach the farmers is different from that developed by ICAR. Even the Secretary, DARE agreed to this fact, during the evidence. The Committee desire that efforts be made in this direction to that the good quality seeds reach the farmers.

The Committee note that 13 bio-fortified varieties of field vegetables and fruits crops have been developed by ICAR. The Committee recommend that in addition to high-yielding and resistant varieties the ICAR should also focus on developing more of bio-fortified varieties which can solve the problems of malnutrition in the country to a large extent. The Committee observe that efforts have been made by ICAR to bring all the newly released varieties in seed chain so that quality seeds of these varieties may reach the farmers in minimum time which helps in enhancing the productivity and improve farmers' income. The Committee recommend that while keeping pace with the demands for new varieties ICAR should also strive to conserve the traditional varieties of seeds with some specific qualities so as to save them from becoming extinct.

HORTICULTRE SCIENCE

4. The Committee note that the thrust areas of Horticulture Science Division are enrichment of genetic resources, development of new cultivars with resistance mechanism to biotic and abiotic stresses, appropriate

production technology and health management system. The perceived threats on climate change pose greater challenge in achieving the targets in the horticultural crops now than ever before. Some of the issues like collection, conservation and characterization of germ plasm for breeding improved varieties, production technology with special reference to abiotic stresses and protected cultivation, seed and planting material, plant health management and food safety, post-harvest handling, processing and value addition, labour needs and mechanization are being addressed in a well-defined timeframe. The Committee note that Rs. 200 crore has been allocated for 2018-19 at BE stage to the Horticulture Division. However, this Division was able to utilize only Rs.91.14 crore (to 31.12.17) out of the allocated funds of Rs.154.90 crore during the year 2017-18. Stating the reasons for under utilisation, the Department has submitted that the EFCs of all the five Schemes were approved during September-October to December, 2017. As a result, expenditure involving policy decisions were deferred for the time being, and hence there was reduced expenditure. However, research activities were carried out within the available funds and there was no adverse impact on major research programmes. The Department has observed that henceforth, the budget utilization will be hastened by taking up pending works and creation of assets and strengthening of research facilities. The under utilization of funds is not acceptable to the Committee. They desire the Department to take all required steps for optimal utilization of funds, especially when the allocation for the year 2018-19 has been substantially increased.

The Committee note that horticulture sector has great scope for expansion and has vast potential for enhancing production, productivity and value added products. The Committee have been informed that during XII

Five Year Plan considerable efforts were made and 12 varieties of tomato, 10 varieties of onion and 4 varieties of potato were evolved. Apart from having tolerance/resistance to important pests and diseases, these are high yielding and have better shelf-life with potential to minimize wastage. It has also been submitted that to address the issues pertaining to post-harvest-losses, researches have been taken up to develop the value added products in various crops. During the last three years, fifty technologies have been developed which are largely helpful in minimization of post-harvest losses. The Committee recommend the Department to develop technology for minimizing post harvest losses and make the farmers aware about value addition technology. The Committee are of the considered opinion that proper marketing of post harvest technologies are not only important from the point of revenue generation but also for providing alternate avenues to farmers of the country so that they can get remunerative prices for their products.

The Committee also recommend the Department to conduct a study for recognition of State/District specific horticulture crops in the Country and to rope in KVKs, Agricultural Universities in the State/ Districts to encourage cultivation of horticulture crops, create awareness about their marketability for enhancement of income. There is a huge potential for cultivation of medicinal and aromatic plants in the country. The Committee recommend the ICAR to give impetus to cultivation of medicinal and aromatic plants for raising the income of farmers.

ANIMAL SCIENCE

5. The Committee note that Animal Science Division is engaged in development of new technologies to support production enhancement,

profitability, competitiveness and sustainability of livestock and poultry sector for food and nutritional security. The mission is to facilitate need based priority research in livestock and poultry sector in on-going and new emerging areas to support productivity increase, thereby reducing the gap between potential and actual yield in the current era of globalization to meet the challenges ahead. The Committee further note that to conserve indigenous cattle breeds of superior quality and genetical improvement of the indigenous varieties the Department in collaboration with state agricultural / veterinary universities, NGOs / state animal husbandry departments is undertaking indigenous improvement programme covering three indigenous breeds i.e. Sahiwal, Gir and Kankrej in their respective breeding tracts. The project is aimed to conserve, propagate and improve the genetic potential of these three indigenous cattle breeds. During the course of evidence, the Department informed that the steps have been taken to identify nondescript livestock in the country. The Committee are of the view that improvement of traditional varieties of livestock is very important as these varieties can provide farmers an option to increase productivity and profitability at low cost as maintenance of traditional livestock is easy as compared to breeds based on imported varieties. The Committee, therefore, desire the Department to give impetus for identification, registration, conservation and improvement of traditional and nondescript varieties of livestock throughout the country.

6. The Department has informed that it has undertaken a number of steps to augment nutritive value of feed and fodder and meet demand for feed and make quality fodder available to the increasing animal population. ICAR is utilizing exotic and indigenous genetic resources through breeding and selection for improving the forage productivity and nutritive value of different

cultivated and pasture species from different agro-climatic regions in India. Fodder crop improvement is being carried out by involving multi-disciplinary integrated approach for development of high yielding varieties. Main fodder crops include cultivated dual purpose cereal/grain crops, annual legumes, as well as perennial grasses (cultivated/rainfed) and range legumes. The Committee feel that availability of quality feed and fodder is essential for improvement of livestock health and productivity. They are of the view that often huge quantity of vegetables such as potatoes, onions etc get wasted in the country for various reasons. The Committee recommend the Department to carry out research on use of such vegetable wastages for feed and fodder for livestock.

Regarding use of antibiotics or medicated feed for livestock husbandry, the Committee were informed that research is being carried out on antibiotic resistance in livestock and creating awareness among farmers, veterinarians and students regarding use of antibiotics through joint collaboration with FAO and CDC sponsored schemes on anti-microbial resistance. Research on “Medicinal herbs as alternative to antibiotics as growth promoter in chicken” is being under taken, value added feed formulations are being prepared to substitute the antibiotics as growth promoter in rearing of chicken. Research is also being carried out on exploring alternatives to antibiotics i.e. probiotics, prebiotics, sinbiotics (pre and probiotics in combination), organic assets, essential oils / herbs in poultry. The Committee desire the Department to create awareness among stakeholders about restricted use of antibiotics in poultry because it can have adverse effect on human health. The Committee recommend the Department to expedite the research on use of medicinal herbs as an alternative to antibiotics.

AGRICULTURE EXTENSION

7. The Committee note that Agricultural Extension Division has mandate of dissemination of available agricultural knowledge and technologies to end users through 11 Agricultural Technology Application Research Institutes, 01 Directorate of Knowledge Management in Agriculture (DKMA) and Krishi Vigyan Kendras (KVKs). The Committee note that the Division with network of 681 KVKs in the country is carrying out on farm testing of location specific agricultural technology and frontline demonstration to demonstrate the production and protection potential of different crops, livestock, poultry and fisheries. The Committee, however, are concerned to note that out of the Budgetary allocation of Rs.232.51 crore during the year 2017-18, the actual expenditure has only been Rs.165.24 crore. The Committee note that for the year 2018-19 the budgetary allocation has been increased only marginally to Rs. 241.81 crore. Explaining the reasons for the marginal increase in allocation for agriculture extension, the Department informed that after merging of Plan & non-Plan from 2017-18 onwards the Salaries, TA, Pension and other administrative expenses have been separated out and being provided for under the Non-Scheme component. Rs. 232.00 crore for 2017-18 and Rs. 241.81 crore under BE for 2018-19 are provided for Grant in Aid-Capital & Grant in Aid-General only. The new programmes shall be initiated keeping in view the budgetary allocation. The horizontal expansion of the activities may have to be re-adjusted in accordance with the budgetary provisions during the year.

8. The Committee appreciate the performance of KVKs during the last three years. The KVKs, as per mandated activities, conducted 97188 On-farm

trials (OFTs) for assessment and refinement of technologies; conducted 3.21 lakh Frontline Demonstrations (FLDs); trained 40.9 lakh farmers including rural youth and farm women; trained 4.48 lakh extension personnel; benefited 392.54 lakh farmers through various extension activities; produced 87900 tonnes of seeds, 1252.42 lakh of planting material and 909.04 lakh of livestock strains and fingerlings; tested 13.36 lakh soil samples; and provided mobile agro-advisories on various facets of agriculture and allied sectors to 395.44 lakh farmers. The Committee, however, note that the infrastructure of some KVKs are not up to the desired level. The Committee desire that the infrastructure in all the 681 KVKs of the Country should be strengthened. There should be a Farmers' Hostel in each and every KVK with separate rooms and dormitories where farmers can stay comfortably during their visit to a KVK. The Committee note that a study was conducted by the National Institute of Labour Economics Research and Development (NILERD), an autonomous institute under NITI Aayog To find out the impact of KVKs on dissemination of improved practices and technologies, in terms of outreach, knowledge, accessibility etc. The Study found that on an average each KVK covers 43 villages and 4,300 farmers about 80% of villages covered by KVK are over 10 km away from the KVK and 42% of technologies adopted by farmers resulted in higher productivity. In view of this the Committee feel that KVKs may be made a hub of activities to attract not only the farmers but also their families. Educational fairs, exhibitions etc. may be organized at these KVKs from time to time to impart knowledge to farmers and their families. Also, KVKs are an important link between the farmers and ICAR. The communication at these places should be a two-way process i.e. in addition to dissemination of available agricultural knowledge and technology to the farmers, the specialist

at KVKs should listen to their problems and communicate the same to ICAR for carrying out further research.

The Committee feel that the extension schemes such as ATARIs, KVKs, DKMA, ARYA etc are highly beneficial means to work as a link between agricultural research and farmers. The objective, Lab to land, could only be accomplished by strengthening the outreach programmes. The Committee note though the existing system of KVKs requires to be strengthened by augmenting manpower, infrastructure etc, funds for the same are not being provided adequately. The Committee in their earlier reports have also been recommending for adequate allocation for extension schemes. The Committee recommend the Department to take up the matter of more allocation of funds with the Ministry of Finance. The Committee also desire that the Department should make all out efforts to spend the whole amount allocated under this Head.

AGRICULTURE EDUCATION

9. The Committee note that Agriculture Education Division of the Department strives for maintaining and upgrading quality, relevance and strengthening of higher agricultural education through partnership with 6 Agricultural Universities, ICAR Deemed-to-be-Universities, Central Agricultural University and Central Universities with Agriculture Faculty by providing support for student and faculty amenities and for holistic development of students. Quality assurance in higher agricultural education is pursued through Accreditation of agricultural universities, their constituent colleges and programmes.

The Committee note that Agriculture Education Division coordinates various activities related to education planning, human resource development and quality reforms. The Committee also note that out of total allocation *i.e* Rs. 694.66 crore during 2017-18 for agriculture education, the actual utilisation was Rs. 211.14 crore till 31.12.17. The allocation for the Division during 2018-19 has been enhanced to Rs. 725. 13 crore as against proposed allocation of Rs. 731.22 crore by the Department. The Committee have been informed that under-utilization of funds has been mainly due to the approval of the SFC/EFCs of the schemes which have made mostly in the latter half of the financial year and CCEA note of the scheme is yet to be approved by the Government. Hence, funds allotted for non-recurring items (works and equipments) could not be utilized. As soon CCEA note is approved, efforts will be made to expend the remaining amount. While appreciating the enhancement in allocation for agriculture education, the Committee are of the considered view that the Department can justify its demand for additional resources only when it is able to first utilize the entire resources allocated to it. The Committee, therefore, recommend that the Department must make sincere efforts to utilize the allocated funds by way of meticulous planning, timely implementation and stricter monitoring of schemes/projects. As informed by DARE, four Institutes namely, Indian Agricultural Research Institute, Indian Veterinary Institute, National Dairy Research Institute (NDRI) and Central Institute of Fisheries Education under ICAR, have been bestowed with Deemed-to-be University status. The Committee also recommend the Department to make efforts for expansion of NDRI as to strengthen its R&D capacity alongwith upgradation of its institutes *viz.* NAARM, Hyderabad etc to Deemed-to-be University status. The Committee desire to be apprised of the

outcome of report of external independent committees constituted to review the utilisation of grants in XII Plan.

NATIONAL AGRICULTURAL HIGHER EDUCATION PROJECT

10. The Committee have been informed that a new programme National Agricultural Higher Education Project (NAHEP) has been launched. The objective of the Project is to support Participating Agricultural Universities and ICAR in providing more relevant and higher quality education to Agricultural University students. The challenges faced by AUs mirror those faced in general by higher education in India. The needs of the agricultural sector resonate with other sectors, i.e., highly trained workforce and relevant cutting-edge research. The current ICAR-Agricultural Universities (AU) System reform agenda requires global knowledge and international expertise to refine its approach and implementation. For this reason, ICAR has requested World Bank support as a knowledge adjunct to the proposed NAHEP. The Project supports the Country Partnership Strategy and addresses the three engagement areas of integration, transformation and inclusion. These engagement areas foresee increased agricultural productivity and support quality improvements of higher education to create a more skilled workforce that continuously improves the productivity of key sectors, including agriculture. The proposed Project is also a multi-Global Practice collaboration (Agriculture and Education) and is expected to support activities and results directly related to cross-cutting strategic areas of climate change, jobs and gender. The Committee have been informed that there was no separate allocation of fund during 2017-18 at BE/RE stage, however Rs 5.0 crore was marked from the Budget of Education division at BE Stage. So far the said amount has not been utilized. The Committee note

that Rs. 7.89 crore has been provided for NAHEP for 2018-19 at BE stage. The Committee are not happy with the non-utilization of funds. The Committee advise the Department to be more prudent in future. The Committee are aware of the fact that ICAR through its institutes and rich human resource have immensely contributed to the growth and development of agriculture in the country but a lot remains to be done. The Committee hope that the project would contribute in strengthening and development of agricultural higher education in the country.

AGRICULTURAL ENGINEERING

11. The Committee note that Agricultural Engineering Division is involved in development and demonstration of technologies related to mechanization of production and post-production agriculture using conventional and non-conventional energy sources and includes mechanization of irrigation and drainage activities; post-harvest and value addition of agricultural products and by products. During 2017-18, division developed 55 Technologies/equipment/machines, 16 products and 07 process protocols for farm mechanization, post-harvest processing and value addition. A total of 7610 different designs of prototypes were manufactured and supplied to different stakeholders. The Committee note that agriculture engineering being the backbone of agriculture sector a lot needs to be done in this field. The Committee are not happy with the financial performance of this area. Out of the allocated funds of Rs.42.6 crore during 2017-18 actual expenditure has only been Rs.26.46 crore. Now, Rs.100 crore have been allocated for the year 2018-19. The Committee recommend that the Department

should strive to utilize this huge amount during the year 2018-19 through meticulous planning and monitoring.

The Committee note that Agricultural Engineering research is devoted to agricultural mechanization leading to enhancing agricultural productivity, identifying the mechanization gaps and future needs of improved farm equipment and machinery for different agro-climatic regions, crops and operations, reducing drudgery of agricultural workers and conducting research and development, prototype production, feasibility testing, frontline demonstration and promoting custom hiring of farm equipment and machinery to bridge identified mechanization gaps and creating employment opportunities in the rural sector.

The Committee observe that most of the farmers in the country are small and marginal farmers with small land holdings. The development of small, effective and economical agricultural implements are *sine qua non* for development small and marginal farmers in the country. The mission of the government to double the farmers income can only be achieved through mechanization of agriculture with emphasis on mechanization of small holdings. The low cost input in mechanization would help the farmers in increasing the productivity and raising their income. The Committee, therefore, recommend the Department to develop small and economical machinery keeping in mind the need of small and marginal farmers. The Committee also note that Custom Hiring Centers for farm implements and equipments have been helpful in mechanization of agriculture. The Centers not only create employment opportunities for rural youth but also provide the farmers implements and equipments at low cost. The Committee recommend that the rural youth from all over the country be involved to promote Custom Hiring

Centers and training be imparted to custom hiring entrepreneurs so as to ensure maximum expansion of these centres.

DOUBLING FARMERS INCOME BY 2022

12. The Committee note that the Government has indicated a change in policy stance from excessive emphasis on food production towards improving farmers' income, and has set a target of doubling it by 2022. The emphasis is on generating higher income for farmers. The Committee are aware of the fact that doubling of farmers income within time frame is a mammoth task and it would require concerted, coordinated and committed approach. The Department informed that it is actively participating with Government's national mission of doubling the farmers' income in collaboration with sister departments through technological, skill development, propagation of critical inputs and various service interventions to increase farm level production and productivity. In order to facilitate the farmers for enhanced income generation, DARE/ICAR has undertaken a number of steps. 1.65 lakh Soil Health Cards have been issued to the farmers, 4.69 lakh extension programmes have been organised, involving 198.67 lakh participants for creating awareness among farmers about all the efforts being made to improve the condition of rural India. A new initiative "Pandit Deen Dayal Upadhyay Unnat Krishi Shiksha Yojana" to train farmers in organic and sustainable farming has been launched. Krishi Vigyan Kendra (KVKs) play important role in frontline extension system in the country for technology assessment, demonstration and capacity building under different farming situations across the country and to realize Digital India vision in agriculture sector, the farmers now have access to web-based 'KVK Portal and KVK App,'

mobile based 'Kisan Mobile Advisory –KMA' SMS portal, 'toll free help lines', ICAR data Centre and mobile apps for different commodities. Further during the course of evidence the Committee were informed that in addition to above, in order to further boost the efforts towards doubling farmers' income by 2022, the ICAR has also constituted the State level Committees. The Vice-Chancellor of one of the Agricultural Universities in the State is the Chairman and one of the Directors of ICAR Institutes /ATARIs, is the convener of the Committee. All the other Vice-Chancellors and the ICAR Directors, Director of ATARI of the concerned region, one nominee of DAC&FW, DAHDF, Ministry of Food Processing Industries and Ministry of Water Resources as well as the senior representatives of the concerned State Department of Agriculture are the members of the Committee. The Committee hope that these efforts will help the Government to a great extent in achieving these ambitious plan of doubling the farmers' income by 2022.

The Committee feel that technological advancement along with dissemination of knowledge would help in raising the income of farmers. It is a known fact that almost 85% of the farmers in the country are small and marginal farmers, who have small land holdings. And to raise the income of such farmers is a big challenge. The Committee recommend the Department to find ways for making agriculture remunerative to these small and marginal farmers so that they can get more profit with lesser investment. The Committee also recommend the Department to help the farmers in increasing production, ensuring quality, providing sustainability through creating awareness about diversification of crops, new technology, integrated farming system and agro forestry etc.

MAINSTREAMING OF WOMEN IN AGRICULTURE

13. The Committee note that with the changing dynamics of agriculture in the country the role of women farmers will be the key to improve agriculture productivity. As has been highlighted in Economic Survey (2017-18) with growing rural to urban migration of men, there is feminization of agriculture sector with increasing number of women in multiple role as cultivators, entrepreneurs and labourers. However, the differential access of women to resources like land, credit, water, seeds and markets needs to be addressed. Towards this, Government has been implementing various schemes which will help improve the entitlements of women farmers and prove to be advantageous in bridging the existing policy gaps in the sector.

The Committee have been apprised of the steps undertaken viz. training, skill development etc. by ICAR for empowering women in agriculture for their economic betterment and livelihood security. The Committee observe that ICAR-Central Institute for Women in Agriculture (ICAR-CIWA), a prime research institute, has the mandate of carrying out research exclusively on gender issues in agriculture. The Department informed the Committee that in view of the importance of development of women farmers, it has been made mandatory to have one Subject Matter Specialist of Home Science in every KVK who is responsible for coordinating and organizing different activities related to farm women including livestock rearing, processing & value addition of produces, drudgery reducing interventions, nutria-farming and their empowerment through entrepreneurship development, organic farming and sustainable farming and is a step towards food quality and safety. The Committee recommend that the Department should orient their research towards the specific needs of farm women. For this purpose user-friendly farm implements may be developed.

The Committee note that the Department has taken various initiatives like ARYA, *Mera Gaon- Mera Gaurav*, *Pandit Deen Dayal Upadhyay Unnat Krishi Shiksha Yojana* to increase interface between farmers and scientist. The ARYA project was implemented to empower the Youth in Rural Areas to take up various Agri-enterprises in Agriculture, allied and service sector for sustainable income and gainful employment. The project is running in 25 districts of 25 States through KVKs. With the target of 5000 youths, the project has been started. Under this initiative, a total of 3879 rural youth have been trained and 930 different enterprise units related to agriculture and allied sector have been established benefitting 2467 rural youth in the selected districts. Mera Gaon- Mera Gaurav programme has been initiated to effectively promote direct interface of scientists of ICAR Institutes and State Agricultural Universities with the farmers to hasten the lab to land process. For this, a group of four scientists each is adopting 5 villages. The project is intended to connect with 25,000 villages. At present, agricultural scientists have started providing information on newer technologies to the farmers in 13,500 villages. Pt. Deen Dayal Upadhyay Unnat Krishi Shiksha Yojna scheme was started in 2016 with a budget of Rs.534.925 lakhs under Unnat Bharat Abhiyan. 100 training centers have been started under this scheme in various states. 150 trainings have been conducted by different centers and more than 4500 farmers were trained in Organic Farming/Natural Farming/Cow Based Economy etc. The scheme is envisaged to bring changes in rural economy, create awareness of environmental issues, eg. soil health, sustainability and productivity. It will help to rejuvenate the tradition of natural farming. The Committee recommend that under all these initiatives specific targets be fixed

for training women farmers so that the benefit of these initiatives can also be reaped by them.

New Delhi
March, 2018
Phalguna, 1939 (Saka)

HUKMDEV NARAYAN YADAV
Chairperson
Standing Committee on Agriculture

**ANNEXURES
WILL BE
UPLOADED
LATER ON**

**STANDING COMMITTEE ON AGRICULTURE BRANCH
(2017-18)**

MINUTES OF THE TWELFTH SITTING OF THE COMMITTEE

The Committee sat on Thursday, the 22nd February, 2018 from 1230 hours to 1430 hours in Room No.'53', Parliament House, New Delhi.

PRESENT

Shri Hukmdev Narayan Yadav – Chairperson

MEMBERS

LOK SABHA

2. Shri Sanjay Dhotre
3. Dr. Tapas Mandal
4. Shri Janardan Mishra
5. Shri Nityanand Rai
6. Shri Mukesh Rajput
7. Shri C.L. Ruala

RAJYA SABHA

8. Sardar Sukhdev Singh Dhindsa
9. Shri Meghraj Jain
10. Shri Vinay Katiyar
11. Shri Shankarbhai N.Vegad
12. Dr. Chandrapal Singh Yadav

SECRETARIAT

1. Shri D.S.Malha - Joint Secretary
2. Shri Arun K. Kaushik - Director
3. Smt Juby Amar - Additional Director

LIST OF WITNESSES

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION)

/ INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)

<u>S.No.</u>	<u>NAME OF THE OFFICER</u>	<u>DESIGNATION</u>
1.	Dr. Trilochan Mohapatra	Secretary (DARE) & DG (ICAR)
2.	Shri S.N. Tripathi	Addl. Secretary & FA
3.	Sh. Chhabilendra Roul	Addl. Secretary DARE and Secretary, ICAR
4.	Dr. K. Alagusundaram	DDG (A. Engg.)
5.	Dr. Anand Kumar Singh	DDG (CS&Hort.)
6.	Dr. A.K. Singh	DDG (Ag. Extn.)
7.	Dr. Narendra Singh Rathore	DDG (Edn.)
8.	Dr. Joykrushna Jenna	DDG (Fy. Sc.)
9.	Dr. A.K. Vasisht	ADG (PIM)
10.	Dr. B.S. Prakash	ADG (ANP)
11.	Dr. Pawan Kumar Agrawal	ADG (NASF)
12.	Dr. R.K. Singh	ADG (CC)
13.	Dr. Sanjeev Saxena	ADG (IPTM&PME)

2. At the outset, the Chairperson welcomed the representatives of Ministry of Agriculture and Farmers to the Sitting convened for oral Evidence of the representatives of the Ministry of Agriculture and Farmers Welfare (Department of Agricultural Research and Education) in connection with the examination of the Demands for Grants (2018-19). After welcoming the representatives of the Ministry to the Sitting, the Chairperson apprised them of the provisions of the Directions 58 of the Directions by the Speaker, Lok Sabha regarding confidentiality of the proceedings.

3. After the Introduction of Witness, one of the representatives of the Department briefed the Committee about the significant features of Demands for Grants(2018-19) of DARE. The Chairperson and the Members of the Committee raised several issues/points as briefly mentioned below and sought clarification/information from the Department thereon:

- I. Need to develop technology for processing of agricultural production to minimize wastages;
- II. Need to have coordination among various research works;
- III. Need to focus on strengthening and expansion of Krishi Vikas Kendra (KVK);
- IV. The KVK need to study and to collect problems being faced by farmers and pass on to ICAR for resolving them;
- V. Need to identify and register nondescript cattle;
- VI. Efforts to be made to identify and recognize and carry out research on unidentified aromatic and medicinal plants;
- VII. Less investment more production, more profit and alternative avenues of employment for farmers would help in raising farmers' income;
- VIII. Need to focus on research that is oriented towards development of small and marginal farmers;
- IX. The objectives behind doubling of farmers income are to bring transformation in the country through eradication of poverty and ending of social inequality;
- X. Efforts be made for availability of quality seeds to the farmers in time;
- XI. Need to focus on research on increase in production in areas such as Bundelkhand having low fertility and productivity;
- XII. Need to have a policy on strong animals;
- XIII. A sub centre of Indian Institute of Vegetable Research be established in West Bengal; and
- XIV. Need to judiciously utilize the rich human resource available with ICAR for agriculture growth and development.

4. The Representatives of the Ministry responded to most of the queries raised by the Members. The Chairperson then thanked the witnesses for sharing valuable information with the Committee on the issue and directed them to furnish the requisite information on the points/items, which were not

readily available with them to the Secretariat of the Committee by 26 February, 2018.

The Committee then adjourned.

(A copy of the verbatim proceedings of the Sitting has been kept separately)

STANDING COMMITTEE ON AGRICULTURE

(2017-18)

MINUTES OF THE FIFTEENTH SITTING OF THE COMMITTEE

The Committee sat on Monday, the 05th March, 2017 from 1000 hrs. to 1050 hrs. in the Chamber of the Hon'ble Chairperson, Standing Committee on Agriculture, Room No. 138 (Third Floor), Parliament House, New Delhi.

PRESENT

Shri Hukm Deo Narayan Yadav – Chairperson

MEMBERS

LOK SABHA

2. Smt.Raksha Khadse
3. Dr. Tapas Mandal
4. Shri Janardan Mishra
5. Shri Mukesh Rajput
6. Shri Konakalla Narayana Rao
7. Shri C.L. Ruala

RAJYA SABHA

8. Shri Mohd. Ali Khan
9. Shri Ram Nath Thakur
10. Shri Shankarbhai N.Vegad

SECRETARIAT

- | | | | |
|----|----------------------|---|---------------------|
| 1. | Shri D.S. Malha | – | Joint Secretary |
| 2. | Shri Arun K. Kaushik | – | Director |
| 3. | Smt. Juby Amar | – | Additional Director |
| 4. | Shri Sumesh Kumar | – | Under Secretary |

2. At the outset, Chairperson welcomed the Members to the Sitting of the Committee. Thereafter, the Committee took up for consideration the following draft Reports:

* (i) XXXX XXXX XXXX XXXX

(ii) Draft Report on Demands for Grants (2018-19) pertaining to the Ministry of Agriculture and Farmers Welfare (Department of Agricultural Research and Education).

* (iii) XXXX XXXX XXXX XXXX

* (iv) XXXX XXXX XXXX XXXX

3. After some deliberations, the Committee adopted the draft Reports without any modifications and authorized the Chairperson to finalize and present these Reports to Parliament.

The Committee then adjourned.

*** Matter not related to this Report**