

PUBLIC ACCOUNTS COMMITTEE
(1971-72)

(FIFTH LOK SABHA)

FOURTH REPORT

[Audit Reports on the Accounts of the Indian
Council of Agricultural Research for
the years 1966-67, 1967-68 and
1968-69]



LOK SABHA SECRETARIAT
NEW DELHI

July, 1971/Asadha, 1893 (Saka)

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CONTENTS

	PAGE
Composition of the Public Accounts, Committee 1971-72	(iii)
Introduction	(v)
CHAPTER I Administration :—	
Reorganisation	1
Receipts and Payments of ICAR	10
Expenditure on Administration	17
CHAPTER II Research Programmes :—	
All-India Coordinated Research Project	26
Role of Central and State Institutions	30
Review of Research Stations	31
Dry Farming	35
Dissemination of Results of Research	37
Evaluation of the work done by the Institutions of the I C A R	42
CHAPTER III Agricultural and Dairy Research :—	
Wheat	43
Rice	47
Jute	55
Cotton	61
Oilseeds	67
Dairy Science	74
CHAPTER IV Publications	90
CHAPTER V Miscellaneous :—	
Delay in utilisation of building and equipment— Cotton Technological Research Laboratory	103
Matunga Outstanding Utilisation Certificates	107
Delay in adjustment of advance	111
Non-submission of proforma accounts	113
Assets of terminate/completed schemes	115
Outstanding recoveries	117
Equipment lying idle	118
Central sheep and wool research Institute, Malpura	121

APPENDIX

PAGE

Summary of main Conclusion/ Recommendations

124

PART II*

Minutes of sittings of the Committee held on :

10th July, 1970
13th July, 1970
6th July, 1971

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(1971-72)

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Shri Avtar Singh Rikhy—Joint Secretary.

Shri B. B. Tewari—Deputy Secretary.

Shri T. R. Krishnamachari—Under Secretary.

• Resigned for the Committee w.e.f. 17th June, 1971.

INTRODUCTION

I, the Chairman of the Public Accounts Committee, as authorised by the Committee, do present on their behalf this Fourth Report of the Public Accounts Committee (Fifth Lok Sabha) on the Audit Reports on the accounts of the Indian Council of Agricultural Research for the years 1966-67, 1967-68 and 1968-69.

2. The Audit Report on the Accounts of the Indian Council of Agricultural Research for the year 1966-67, was laid on the Table of the House on 6th August, 1970 and for the years 1967-68 and 1968-69 on—July, 1971.

3. The Committee (1970-71) examined the Audit Reports at their sittings held on 10th and 13th July, 1970. Consequent on the dissolution of the Lok Sabha on the 27th December, 1970, the Public Accounts Committee (1970-71) ceased to exist with effect from that date. The Committee of 1971-72 considered and finalised the Report at their sitting held on the 6th July, 1971 based on the evidence taken and the further written information furnished by the Ministry of Agriculture. The Minutes of these sittings form Part II* of the Report.

4. A statement containing summary of the main conclusions/recommendations of the Committee is appended to this Report (Appendix) for facility of reference these have been printed in thick type in the body of the Report.

5. The Committee place on record their appreciation of the commendable work done by the Chairman and the Members of the Public Accounts Committee (1970-71) in taking evidence and obtaining information for this Report which could not be finalised by them because of the sudden dissolution of the Fourth Lok Sabha.

6. The Committee place on record their appreciation of the assistance rendered to them in the examination of these Audit Reports by the Comptroller and Auditor General of India.

7. The Committee would also like to express their thanks to the officers of the Ministry of Agriculture and the Indian Council of Agricultural Research for the cooperation extended by them in giving information to the Committee.

NEW DELHI;

July 8, 1971.

Asadha 17, 1893 (Saka).

ERA SEZHIAN,

Chairman,

Public Accounts Committee.

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CHAPTER I

ADMINISTRATION

Reorganisation

The Indian Council of Agricultural Research (originally known as Imperial Council of Agricultural Research) was established in 1929 in pursuance of the Government of India Resolution dated 23rd May, 1929. It is a registered society under the provisions of the Societies Registration Act, 1860.

1.2. After examining the recommendations made by several teams of experts, particularly the Agricultural Research Review Team headed by Dr. M. W. Parker, on the reorganisation of agricultural research in India, and in consultation with the Panel of Agricultural Scientists and experienced administrators drawn both from the States and the Centre the Government of India decided on March 30, 1965, to reorganise the Indian Council of Agricultural Research on the following lines:

- (i) Reconstitution of the Indian Council of Agricultural Research as a fully autonomous organisation, without changing the present name of the Society;
- (ii) Bringing under the reorganised Council all the research institutions under the control of Departments of Food and Agriculture, including those under the Central Commodity Committees;
- (iii) Reconstitution of the Governing Body of the Council with a view to making it pre-eminently a body of scientists and those with interest in or knowledge of agriculture;
- (iv) Giving financial assistance for research to State research institutes and other research institutes such as universities by the reorganised Council in the form of block grants on the model of the Atomic Energy Commission;
- (v) Designating the leading research institutes viz., the Indian Agricultural Research Institute, the National Dairy Research Institute and the Indian Veterinary Research Institute, as national institutes and delegating to them and other institutes enhanced administrative and financial powers:

- (vi) Making arrangements for recruitment to scientific posts through its own selection committees or panels, consisting of outstanding scientists in the particular discipline; and
- (vii) Appointment of an outstanding scientist as the Chief Executive of the Council with the designation of Director-General.

1.3. The basic intention behind the above decisions was to make the Council a truly functional, technically competent and fully autonomous organisation for promoting, guiding, co-ordinating and directing agricultural and animal husbandry research and education throughout the country.

1.4. Subsequently, the Government of India considered the question of abolition of the Central Commodity Committees and the consequential arrangements to be made for looking after the work handled by these Committees and approved of the following proposals:

- (i) Abolition of the nine Central Commodity Committees dealing with cotton, oilseeds, lac, coconut, sugarcane, jute, tobacco, arecanut, and spices and cashewnut;
- (ii) Transfer of all research work handled by these Committees (including the administrative control of their research stations and institutes) to the Council on the abolition of the Committees;
- (iii) Taking over by the Department of Agriculture of all the development and marketing programmes and schemes being handled by the Commodity Committees; and
- (iv) Constitution of Development Councils for the various crops for assisting and advising the Department of Agriculture in regard to the development and marketing problems of various crops.

1.5. The following Commodity Committees, Research Centres, and Institutes, which were being financed by the Central Government grants, were taken over by the Council w.e.f. dates shown against them:

Commodity Committees.

- | | | |
|---|---|------------|
| <ul style="list-style-type: none"> (i) Indian Central Sugarcane Committee (ii) Indian Central Jute Committee (iii) Indian Central Tobacco Committee (iv) Indian Central Arecanut Committee (v) Indian Central Spices and Cashewnut Committee | } | 1-10-1965. |
|---|---|------------|

(vi) Indian Central Oilseeds Committee	}	1-4-1964
(vii) Indian Central Cotton Committee		
(viii) Indian Central Coconut Committee		
(ix) Indian Central Lac Cess Committee		

Research Institutes

(i) Indian Agricultural Research Institute, New Delhi	}	1-4-1966.
(ii) Indian Veterinary Research Institute, Izatnagar.		
(iii) Central Potato Research Institute, Simla.		
(iv) Central Rice Research Institute, Cuttack.		
(v) National Dairy Research Institute, Karnal		
(vi) Central Arid Zone Research Institute, Jodhpur.		
(vii) Indian Grassland and Fodder Research Institute, Jhansi.		
(viii) Central Sheep and Wool Research Institute, Malpura.		
(ix) Central Tuber Crops Research Institute, Trivandrum.		
(x) Central Inland Fisheries Research Institute, Barrackpore (West Bengal).	}	1-10-1967
(xi) Central Marine Fisheries Research Institute, Mandapam Camp, District Ramanathapuram (Tamil Nadu)		
(xii) Central Institute of Fisheries Technology, Ernakulam (Kerala)		
(xiii) Indian Institute of Sugarcane Research, Lucknow	}	1-1-1969
(xiv) Sugarcane Breeding Institute, Coimbatore.		
(xv) All India Soil and Land Use Survey Organisation, New Delhi.		

Soil Conservation Research, Demonstration and Training Centres :

(i) Ootacamund (Tamil Nadu)	}	1-10-1967.
(ii) Bellary (Mysore)		
(iii) Chandigarh		
(iv) Kotah (Rajasthan)		
(v) Dehra Dun (U.P.)		
(vi) Vasad (Gujarat)		
(vii) Agra (U.P.)		
(viii) Ibrahimpatam (A.P.)		

1.6. The Committee desired to know how far the objectives for merging various research committees in the Council had been achieved. The Director General, Indian Council of Agricultural Research stated: "The reason why we had set up a number of institutes in addition to the multi-disciplinary institutes like the Indian Agricultural Research Institute and the Indian Veterinary Research Institute, was to give a concentrated attention to particular crops or to particular commodities, and that objective has been served. By having an institute specially dealing with one crop or one commodity, concentrated attention was given. But it was found... that it was a case of fragmentation of holdings. These institutes became isolated. And experience all over the world has shown that research, especially applied research, if it is to make progress in the modern era, there must be team work and very close co-ordination of research. The days have gone when research would be done in isolation. Particularly, in applied research in agriculture, we need to make use of

the latest advances which occur in different disciplines on different crops. These institutions were controlled by different organisations. So, the objective was to get this co-ordination in order that we may get the best benefit out of the personnel etc. which we had put into the research."

1.7. The witness added: "Another feature of the small institutes was low scales of pay. For example, at this Coconut Institute the Director started in Rs. 700—1250 scale, with the result that we could not attract the scientist of the calibre required to solve the problems. Now they have been brought together to the ICAR, they feel that they are members of one family and with prospects of promotion. And they can go from one institute to another. We arrange frequent conferences—crop-wise and discipline-wise—especially in relation to all-India coordinated projects that we have formulated. And in this way, in the coordinated project, this conference will bring together the scientists not only from the Central Institute but also those who are remote in the States or even in private laboratories."

1.8. The Committee asked whether a proper evaluation of the assets and liabilities of the committees/institutes had been made and whether these had been shown in the accounts. The representative of the Indian Council of Agricultural Research stated that the last accounts of the Commodity Committees were audited by the respective Accountants General. The Council had requested that the detailed statement of the assets and liabilities of these commodity committees should be got certified by the Accountant General concerned. Except for Indian Lac Cess Committee at Ranchi, the lists of assets and liabilities as certified by the Accountants General concerned had been received. With regard to Lac Cess Committee the Council was pursuing the matter with the Accountant General, Bihar. As regards the Central Institutes, the witness stated that under the Government system, the institutes themselves did not have detailed accounts of the buildings and facilities etc. and quite a number of transactions used to be settled by book adjustments. The Council had to collect lot of details from all the institutes which in turn had to consult the Central Public Works Department, and also the Accountant Generals concerned. In respect of 11 institutes and 8 centres, the Council had all the details with them. The remaining three institutions included the Indian Agricultural Research Institute in which there were 19 divisions and 20 stations all over the country. The witness added that the Council were making lot of effort but still the details were not complete. With regard to the two Sugar Research Institutes it was stated that the need to be executed for the purpose had still to be finalised. It was proposed to hold a combined meeting of the representatives of the Department of Agriculture,

Indian Council of Agricultural Research, the Comptroller and Auditor General, the Accountant General, Commerce, Works and Misc. and the Ministries of Finance and Law.

1.9. In a written reply, the Department of Agriculture have stated: "The Assets and Liabilities of the following Research Institutes have not so far been evaluated:

- (1) Indian Agricultural Research Institute, New Delhi.
- (2) Indian Institute of Sugarcane Research, Lucknow.
- (3) Sugarcane Breeding Institute, Lucknow.

The Administrative Control of the Indian Agricultural Research Institute, New Delhi was transferred to Indian Council of Agricultural Research w.e.f. 1st April, 1966. This Institute was established in the year 1908 at Pusa (Bihar), and shifted to New Delhi in the year 1936. It has 20 Regional/Sub-stations located at different places all over the country and 19 Divisions at the Headquarters. The cost of buildings, land, and other immovable properties are to be ascertained from the old records of the C.P.W.D. Similarly, the information regarding amounts lying in the books of Accountants General under the Debt, Deposits and Remittance Heads as on 31st March, 1966, are to be collected from their offices. The matter is being pursued vigorously with them.

1.10. The two Sugarcane Research Institutes mentioned above were transferred to I.C.A.R. w.e.f. 1-4-1969. These Institutes had already been asked to obtain the required information from the C.P.W.D., Accountants General concerned and to furnish the information to the Council. Necessary action has also been initiated by these Research Institutes.

The valuation of the assets and liabilities of the erstwhile commodity committees and the research institutes under their administrative control as on the dates of their abolition/transfer has been made. These statements have been checked by the respective Accountants General and certified except in the case of Indian Lac Cess Committee. The matter relating to the verification by audit of the statement of assets and liabilities of this committee is being pursued with the Director, Directorate of Lac Development and the Accountant General, Bihar.

1.11. The liquid assets of the erstwhile Commodity Committees and the Institutes under their control and the liabilities discharged therefrom are distinctly exhibited in the accounts. According to the resolutions of the Government of India, regarding transfer of the

administrative control of the erstwhile Government research institutes and four committees, their assets and liabilities vest in the Central Government and these are to be transferred on terms and conditions to be embodied in the deeds of transfer to be executed later. The action in regard to the determining the nature and form of deeds of transfer and the manner in which these would be transferred from the books of the Government of India to the I.C.A.R., is under finalisation in consultation with Ministries of Finance, Law and Comptroller and Auditor General of India. Pending formal transfer of the assets and liabilities, their value is not being shown in the accounts of the Council as the *de jure* ownership of the properties still vests in the Government."

1.12. The Committee asked whether it was proposed to transfer any other institute/centre to the Indian Council of Agricultural Research. The Director General, ICAR replied: "The Reviewing Committee on Research and Education had recommended that the Central Food and Technological Research Institute at Mysore should be taken over. It also recommended that the Botanical Survey and the Zoological Survey, which at one time worked in the Ministry of Food and Agriculture, should be brought back because it is close to food and agriculture. And the same Committee also suggested that the organisation dealing with tea, coffee and rubber should also be looked after by ICAR. It was, however, felt that let us first consolidate the position of ICAR by taking only those institutes which are within the purview of the Ministry itself. When the consolidation has been done, we can see whether we can negotiate with other Ministries for the transfer."

1.13. In their report, the Agricultural Research Review Team, 1964 had made the following recommendations regarding transfer of various organisations to the Council:

- "(a) Most of the organisations that we wish to have placed under the control of the new Council are at present in the Ministry of Food and Agriculture, but there are some under other Ministries which we believe it will be desirable as well as logical to bring in. We had no time to examine these organisations, and our recommendation is based largely on principle, and on the following considerations.
- (b) The Botanical and Zoological Surveys of India were under the Ministry of Food and Agriculture until 1952, when they were transferred to the Ministry of Natural Resources and Scientific Research, and are now under the Ministry of Education. The Botanical Survey with its Botanical Gardens

and Herbarium could be a valuable asset to agricultural research. Similarly, direct association between the rapidly expanding entomological research in Agriculture and Zoological Survey should be valuable.

(c) A good case can be made for associating research in food technology and human nutrition with the agency concerned with research in food production. This would bring under the CAFR, the Central Food Technological Research Institute at Mysore. We would express the hope that in expanding research in Home Science, the Council would establish close co-operation with the Nutrition Research Laboratories, Hyderabad.

(d) Work on three plantation crops-coffee, tea and rubber, is at present vested with three special Boards, all under the Ministry of Commerce and Industry. Each of these crops has one or more research institutes managed by the respective Boards, and the technical staff practically work in isolation and are denied the benefit of meeting and discussing common problems with staff of identical disciplines in the agricultural department."

1.14. The Study Team of Administrative Reforms Commission on Agricultural Administration have in their Report submitted in August, 1967 made the following recommendations about the research work handled by other organisations:

"All India Boards like the Coffee Board, Tea Board, Rubber Board, etc., have their own research set up independent of the ICAR. Funds for research pertaining to their respective commodities come from the Ministry of Commerce. We are not in favour of the continuance of this set up. Research wings in these Board suffer from a number of handicaps. Being smaller units, they are not able to get competent men to work in their research posts. Secondly, they do not have expert guidance in their respective subject matter fields. Thirdly, the research workers and the research programmes in these Boards are under the influence of non-scientists, and this is not a healthy situation for promoting the best standards of research. In view of this, we would very much like the research aspects in all these All India Boards to be brought under the overall purview of the I.C.A.R. But the research work in respect of these commodities should be, controlled and directed by the Agricultural Universities in the respective States. The funds for research

presently being administered directly by the All India Board should pass through Agricultural Universities.'

"Research work on a number of aspects allied to agriculture are presently being promoted and conducted by many organisations, such as C.S.I.R., National Botanical Survey, National Zoological Survey, National Geological Survey, etc. It appears there is not the desired co-ordination today among all these agencies and the I.C.A.R. In the absence of effective coordination among the various agencies, it would be difficult to expect rapid progress. Besides, the un-coordinated efforts lead to wastage of resources, both financial and technical manpower. It would, therefore, be in the national interest to bring about better coordination among all these agencies, and we strongly recommend this. The I.C.A.R. should be the coordinating agency."

1.15. The Study Team of Administrative Reforms Commission also recommended that "the Indian Council of Agricultural Research should be the only coordinating and sponsoring body for all aspects of research in agricultural sciences. It should not undertake research directly. The Indian Council of Agricultural Research should be given a statutory recognition by a Parliamentary Act. This would give the organisation and the research workers more security. Financial grants to the I.C.A.R. should be made on a block grant basis and this should be statutorily provided."

1.16. In a written reply, the Department of Agriculture (I.C.A.R.) have stated that the bill for declaring the Indian Council of Agricultural Research as an institution of National importance is at present in the drafting stage in consultation with the Ministry of Law.

1.17. The Committee note that after examining the recommendations made by several teams of experts, the Government of India decided in March, 1965 to reorganise the Indian Council of Agricultural Research. The basic intention behind the decision was to make the Council a truly functional, a technically competent and fully autonomous organisation for promoting, guiding, coordinating and directing agricultural research and animal husbandry research and education throughout the country. Accordingly, during the period 1st October, 1965 to 1st April, 1969, the Council took over the functions of 9 Central Commodity Committees, 15 research institutes and 8 soil conservation centres, which were previously financed by

the Central Government grants. Although, the Council has been reorganised from 1st April, 1966 and has taken over the administrative control of the various organisations, the process of consolidation has not yet been completed. The evaluation of the assets and liabilities of three research institutes (Indian Agricultural Research Institute, Indian Institute of Sugar Research and Sugarcane Breeding Institute) and one Commodity Committee (Indian Lac Cess Committee) has not yet been done. The formal transfer deeds in respect of assets and liabilities of the erstwhile Government Research Institutes and four Commodity Committees have not yet been executed. As mentioned in the subsequent part of this Report, the Secretariat of the Council has not yet been reorganised and it continues to be an attached office of the Department of Agriculture. A bill for declaring the Indian Council of Agricultural Research as an institution of national importance is still under drafting in consultation with the Ministry of Law. The Committee desire that the reorganisation of the new set up of the Council should be completed without further delay and would like to know the action taken by Government in that behalf.

1.18. The Committee hope that the Indian Council of Agricultural Research will play effective role in not only strengthening agricultural research and animal husbandry but also establishing proper co-ordination in the research work and education throughout the country.

1.19. The Agricultural Research Review Team (1964) had also suggested bringing under the control of Indian Council of Agricultural Research, certain other organisations dealing with agricultural research. The Committee particularly wish to refer to research work in regard to coffee, tea and rubber, at present being done under the control of the respective Boards which work under the Department of Foreign Trade. According to the Review Team, "Technical staff practically work in isolation and are denied the benefit of meeting and discussing common problems with staff of identical discipline in the agricultural department." The Study Team of the Administrative Reforms Commission have also pointed out the need for bringing the research respects of these Boards under the overall purview of Indian Council of Agricultural Research. The shortcomings in the research work pointed out by the Study Team are lack of competent men to work in their research posts, lack of expert guidance in their respective subject matter fields and influence of non-scientists on

research workers and research programmes. In view of the importance of the three commodities for internal consumption and export, the Committee would urge the Government to pay serious attention to the inadequacy of research work and examine how far the situation can be improved by bringing this work under the purview of the Indian Council of Agricultural Research or establishing closer coordination between the Boards and I.C.A.R.

1.20. The Committee desire that Government should also examine the feasibility of bringing other research organisations concerned with agricultural research under the purview of the Indian Council of Agricultural Research.

Receipt and Payments of Indian Council of Agricultural Research

1.21. The summary of receipts and payments account included in the Audit Reports indicated that the position of major items of receipts and payments of the Council during the years 1966-67, 1967-68 and 1968-69 was as follows:—

<i>Receipts</i>	1966-67	1967-68	1968-69
	(in lakhs of Rs.)		
Grants from Central Government	581.35	853.99	1132.38
Receipts from Cess levied under Agricultural Produce Cess Act, 1940	71.51	58.05	72.02
<i>Payments</i>			
Research Institutes	392.26	543.33	657.42
Research Schemes	285.49	352.57	517.31
Administration	40.34	48.84	61.61
<i>Closing Balance</i>	104.67	181.80	232.56
Investments of General account held by the Council in addition to the closing balance	304.36	289.83	298.69

Paragraph 1 of Audit Reports 1966-67, 1967-68 and 1968-69]

1.22. The Committee desired to know the reasons for decrease in income from cess levied under Agricultural Product Cess Act, 1940 from Rs. 71.51 lakhs in 1966-67 to Rs. 58.05 lakhs in 1967-68. The representative of the Indian Council of Agricultural Research stated:

"Actually the normal collection of AP cess right from 1965-66 onwards was between Rs. 70 to 75 lakhs. In April, 1966

an enactment entitled 'Produce Cess Act, 1966' was introduced which was meant to replace the cess which was being earlier collected under the respective Commodity Cess Act e.g. on oil seeds, cotton etc. In December, 1966 cashew kernel was taken out of the purview of AP Cess to be covered by Produce Cess Act. I think roughly about 14.85 lakhs, which was being collected as cess on cashew kernel, was taken out of the purview AP Cess Act, 1940. This difference of about 14 lakhs accounts for the sudden decrease in the cess collected in 1967-68. Because there were very good trends in production from the year 1968-69 and the number of items for exports also went up, it came to Rs. 72 lakhs in the year 1968-69 to Rs. 78.10 lakhs for 1969-70 and for the coming year we expect it to be Rs. 85 lakhs. This sudden decrease in 1967-68 was only because of the taking away of cashew kernel."

1.23. The Committee desired to know the principles governing expenditure from (i) Government grant (ii) proceeds of A.P. Cess Act, 1940 and the Produce Cess Act, 1966 and (iii) PL-480 funds. In a written reply the Department of Agriculture have stated: "The Council has been reorganised with effect from 1st April, 1966 and a number of Central Research Institutes of the Government of India and of the erstwhile Commodity Committees have been transferred to the control of the Council from various dates ranging from 1st April, 1966 onwards. The entire expenditure of these Institutes, whether Plan or non-Plan was being met directly or indirectly by the Government of India prior to their transfer to the Indian Council of Agricultural Research. One of the conditions of the transfer of these Institutes to the Council was that the Government of India will pay suitable grants to the Council for meeting the entire expenditure of these Institutes. In the Agricultural Sector, all research projects of the Central Government are being implemented through the agency of the Indian Council of Agricultural Research. The Council is paid grants to meet the expenditure of these projects.

1.24. In addition, as per the terms of the setting up of the Council, the Government of India is required to provide the Secretariat assistance to the Council at its cost. The expenditure of the Secretariat of the Council is, therefore, met by the Government of India partly by payment of grant-in-aid to the Council and partly in the shape of direct expenditure of the Department of Agriculture.

1.25. Under the provisions of the Agricultural Produce Cess Act, 1940, it is obligatory on the Government of India to pay to the Indian

Council of Agricultural Research in full, the net realisations of the cess under this Act, reduced by the cost of collection as determined by the Central Government. The cess so paid to the Council is being utilised for furtherance of the objects, for which the Council has been established.

1.26. In general, this cess money is being utilised for conducting research on such important scheme of *ad hoc* character in agriculture, animal husbandry, dairying and arid zone etc., as are specifically sanctioned by the Governing body to be met from A.P. Cess-Fund.

1.27. According to Section 5 of the Produce Cess Act, 1966 the proceeds of the duty levied and collected under this Act reduced by the cost of collection, as determined by the Central Government, together with any moneys received by the Central Government for the purposes of this Act, shall be utilised by the Central Government to meet the expenditure incurred in connection with measures which, in the opinion of the Central Government, are necessary or expedient to promote the improvement, development and marketing of the Produce i.e., Cotton, lac including refuse lac, coconut, oilseeds and Cashew Kernel.

1.28. The projects, which are of mutual interest to the Government of India and the USDA, are financed out of the PL-480 funds. A project is sponsored by the prospective Principal Investigator generally through the institution where he proposes to conduct the research. After an initial scrutiny in the Indian Council of Agricultural Research, the project is examined by the Screening Committee with DG as Chairman. The members of the Ministries of Agriculture, Defence, Foreign Trade and External Affairs and of Planning Commission, CSIR and UGC are associated with this scrutiny.

1.29. The project is then referred to the Government of India Committee for approval. Secretary (Agriculture) is the Chairman of this Committee, and organisations and Ministries mentioned above (excluding Ministry of Foreign Trade), together with Ministries of Finance, and Education are associated in this examination. The matter is, thereafter, taken up with USDA authorities for consideration of the project and provision of funds, where agreed. The project is subjected to close scrutiny in ICAR as well as in the Committees to avoid any duplication in research."

1.30. The Committee drew attention to the closing balance of Rs. 104.67 lakhs at the end of 1966-67, Rs. 181.80 lakhs at the end of 1967-68 and Rs. 202.56 lakhs at the end of 1968-69 and asked the reasons for the unspent balance. The representative of the Indian Council of Agricultural Research stated: "This unspent balance is naturally based on whatever receipts we have and whatever expenditure we have. This is not with reference to the original budget. I shall explain the reasons for closing balance of Rs. 202.56 lakhs in 1968-69....I shall divide this into two or three categories: For the grants drawn from the Government of India in the first two years i.e., 1966-67 and 1967-68, in each year there were unspent balances out of the grants, for example Rs. 41.80 lakhs in 1966-67 and Rs. 54.44 lakhs in 1967-68. For 1966-67 and 1967-68 i.e. for these two years we did not surrender the unspent balances to the Government of India as we wanted to make the adjustments after the audit of the accounts of those years. Unfortunately, the audit of the accounts of the ICAR for 1965-66 and 1966-67 was delayed. It is because after the reorganisation we had to devise forms of accounts so that all the institutes would send their accounts to us and we would compile in one form acceptable to audit. Right from May, 1966 we were in touch with the Finance Ministry and the CAG's Office and it took a little time for the final accounts form to be approved by the Audit also so that we could prepare our account on that basis. The accounts of the two years were finally audited only in March and September, 1969.... We have already surrendered the unspent balance of 1966-67 and 1967-68 which was kept with us."

"Of the Commodity Committees abolished, some of them like Central Oilseeds Committee had heavy cash balance with them. The other Commodity Committees had mostly security but we got Rs. 50 lakhs and odd from the Oilseeds Committee. We have not surrendered this amount to the Government because just as we have taken over liquid assets, we have taken liabilities of the former Commodity Committees with reference to the assets already taken over by us, so that at the time the transfer deed is struck, adjustment can be made."

"96.24 lakhs is the unspent money from Government grant which we have since surrendered. 52 lakhs is Commodity Committees money with us as cash balance. The pay for the month of March had to be drawn on the 1st April. We had to send money in March to all the Institutes by demand draft. Every year about 50 to 60 lakhs we have to draw in excess during the month of March so that this could be sent to Institutes. It gets adjusted in the next year.... a sum of Rs. 7.30 lakhs is the total expenditure on the

Institute and Headquarters for the year. If we divide by twelve it comes about to Rs. 60 lakhs. I kept about Rs. 60 lakhs for being spent in the first month of the next year. This Rs. 60 lakhs and other amounts mentioned will make up the total. We draw the approximate amount based on requirements."

1.31. The Committee asked whether the grants to the Council were given on the basis of the demand. The witness replied: "Based on the budget provision we make for the entire non-plan activities, and the continuing plan schemes in operation. We take the grants from the Government in four or five instalments. The first instalment is for the first two months based on the vote-on-account passed by Parliament—it is only an arithmetical calculation i.e. 1/6th of the grant meant for ICAR on the non-plan expenditure and continuing plan. Thereafter after the budget is passed—Appropriation Act—then we take for another four months. This is also without relating it to the previous account because accounts for the previous year would be ready only by June. I can have consolidated account by September or so. Therefore, in the first two months and again for the next four months, we draw from the Government of India based on the demand or, say, based on the budget provision. And adjustments are made thereafter according to the previous expenditure, balance etc."

1.32. The Committee drew attention to the observations made by them in para 21 of their 35th Report (1964-65) that Government continued to give grants to the Council from year to year without considering the financial position of the latter and even properly scrutinising the schemes with the result that Council did not spend the money but went on investing it in securities. Government had then decided that the expenditure on research schemes should be met entirely from the research funds of the Council as long as reserves were available and Government grants would be used only for developmental schemes. The Committee asked how far this decision had been implemented. The representative of the Council replied that the recommendation related to accumulation from A.P. Cess fund before the Council was reorganised. As the actual amounts spent were less than the cess collected, the Council invested a lot of money in fixed deposits and long term securities with the Government of India. It was therefore decided that for the ICAR's requirements of money on research, Government should not release grants until the Council was going to deplete the reserves. Accordingly the next two years i.e. 1965-66 and 1966-67 Government did not release grants for certain plan schemes for which provision was made in the budgets. The cash balance to the extent of fixed deposits was encashed on maturing and the money was utilised and the Government

did not give grants to this extent. The Council was asked by Government to use money which was invested. Regarding long term securities it was considered not advisable to go to market to sell the securities. The understanding was that the Council should use the securities as and when they matured.

1.33. The Department of Agriculture have stated that the suggestion that the amount becoming available to the Council as and when the securities mature may be utilised for meeting the expenditure of the various types of schemes in the ICAR and to that extent less grant-in-aid can be claimed from the Government of India in those years is being formally taken up for consideration in consultation with Finance.

1.34. The Committee drew attention to a saving of Rs. 56.41 lakhs under the Group-head A-1—Grants-in-aid (Agriculture) in 1968-69 due to availability with the Council of unspent balance of grants drawn in earlier years and asked whether Government had examined the position in the light of the activities of the Council as to how far future payment of grants-in-aid should be regulated to avoid unnecessary locking up of money with the Council. In a written reply, the Department of Agriculture have stated: "The unspent balances for 1966-67 and 1967-68 have already been adjusted by short drawal of the grants given to the Council during 1969-70. The unutilised balances relating to 1968-69 and 1969-70 will be adjusted during the current year. The delay took place in the adjustment of these unspent balances in the earlier years of the reorganisation of the Council as there was delay in compilation of the accounts and audit thereof because of certain initial difficulties in the finalisation of the account forms in consultation with the Comptroller and Auditor General of India. As the expenditure is incurred at various stations located at different places, it has been considered expedient to determine the unutilised balances for each year based on the audited accounts for that year with reference to which the actual expenditure figures duly audited become available to the Council. As the transitory period is now over and the procedures have become more or less established, it should be possible for the Council to adjust the unspent balances of each year during the following year. So far there has been an element of unspent balance each year arising out of the drawal in March of sums required for expenditure in the Institutes and at the Headquarters during April of the next year. The Council has recently approached the Ministry of Finance for the sanction of an interest-free ways and means advance to the Council equal to the requirements of funds for April so that the recurrence of the intentional over-drawal of funds during one year to meet a part of the requirements of the next year is avoided.

1.35. The question of mode of payment of the grants-in-aid to the Council has already been finalised. It has been decided that the total grant due to the Council for each year will be paid in four instalments. The first instalment will be for 1/6th of the total budget (or smaller if the 'vote on account' is for less than 2 months) provisions for the continuing schemes only. The 2nd instalment will be for four months' budget provision for the continuing schemes only. Both these instalments of grant will be paid without any reference to the previous expenditure incurred but based on the approved budget. The third and fourth instalments which will be for 3 months' provision each will be allowed only if the expenditure incurred out of the grant drawn earlier justifies the release of more funds to the Council. While allowing the 4th instalment, an overall picture of the requirement of funds for each scheme will be worked out by the Council and only the required amount will be paid to the Council after carrying out adjustments of the grant already drawn against various items/schemes."

1.36. The Committee are dissatisfied over the Indian Council of Agricultural Research holding large amounts as their closing balances at the end of the years 1966-67, 1967-68 and 1968-69. The closing balance was Rs. 104.67 lakhs for 1966-67, Rs. 181.80 lakhs for 1967-68 and Rs. 202.56 lakhs for 1968-69. The sources of income of the Council are from the cess levied under the Agricultural Product Cess Act, 1940, and grants received from Government of India. In paragraph 21 of their 35th Report (1964-65), the Committee had pointed out that Government continued to give grants to the Council year after year without considering the financial position of the latter and even properly scrutinising the schemes. With the reorganisation of the Council from 1st April, 1966, the quantum of Government grants has been increased to meet expenditure on their expanding activities. The Committee desire that the Government grants required for the expenditure of the Council should be determined realistically. The quantum of cash grants should be carefully determined after taking into consideration the estimated receipts from cess and the receipts from encashment of securities due to mature during the particular year.

1.37. The Committee are distressed that there has been an element of unspent balance each year arising out of the drawal in March of sums required during April of the next year. It has been said that the Council has recently approached the Ministry of Finance for sanction of interest free ways and means advances to the Council equal to the requirement of funds for drawal so that the recurrence of intentional-over drawal of funds during one year to meet a part

of the requirement of the next year is avoided. The Committee suggest that a suitable procedure should be worked out to meet the situation.

1.38. The Committee hope that under the new system of release of grants to the Council in instalments, drawal of funds more than the requirement for the year will be avoided.

1.39. The Committee note that there has been delay in surrender/adjustment of unspent balance of Government grants due to delay in compilation of accounts and audit thereof. The unspent balances for 1966-67, 1967-68 were adjusted during 1968-70 and those relating to 1968-69 and 1969-70 would be adjusted during 1970-71. The Committee hope that with the finalisation of the accounting system, adjustment of unspent amounts of Government grants will invariably be made during the following year.

Expenditure on administration

1.40. The Committee desired to know the reasons for increase of expenditure on Administration from Rs. 40.14 lakhs in 1966-67 to Rs. 48.85 lakhs in 1967-68 and Rs. 61.61 lakhs in 1968-69. The representative of the Indian Council of Agricultural Research stated that the budget of the Council had gone up because of the reorganisation of the Council's work and taking over of various institutes. As a result of the various projects undertaken by the Council, a number of posts had been created in the Council e.g. posts of Deputy Directors General, Assistant Directors General and other Scientists' posts. In a note furnished to the Committee, the Department of Agriculture have stated that the administrative expenditure in the year 1969-70 was Rs. 71.80 lakhs (Headquarters Rs. 56,97,109 and Institute of Agricultural Research Statistics Rs. 14,83,126). The Director General stated that the headquarters of the Indian Council of Agricultural Research had to coordinate the work of all the institutes and also issue grants to various agricultural universities etc. Because of the necessity of coordination work on research, the staff at headquarters had gone up. The Committee asked whether any ratio had been fixed between expenditure on research and administration. The witness replied: "In fact there is no fixed ratio. We have got various Government and semi-Government institutes in the country. Certain members of the staff have got partly administrative and partly scientific duties." The witness further stated that the work at the headquarters of the organisation was the decision taking and of executive nature. They tried to promote development and coordinate research and for this purpose it was necessary to have some persons

at the highest level. They had Deputy Directors General who were the top scientists in their discipline. The Council sanctioned a number of *ad hoc* schemes. They had to watch the all-India coordinated schemes sponsored by the Council. For the work of that type, the Council made use of scientific panels and standing committees on which they took scientists from outside so that they might have the benefit of those active scientists. In these committees and panels, the proportion of the scientists of ICAR was small. The Council had also to help the agricultural universities which were visited by Inspection Teams comprising representatives from ICAR and other institutions. The witness added that to carry out the activities of the Council they needed administrative staff to see that meetings were held in time, decisions were implemented and so on. The witness further stated that the staff of the Council also included the technical staff of the Institute of Agricultural Research Statistics. This Institute till now was a part of the Council. It had been made a separate Institute very recently. The last Pay Commission had classified agricultural statisticians as non-scientists and they were given the non-scientists' scale. That had inflated the number of technical staff. The witness added: "We certainly do realise that the scientific staff should be in right numbers and other categories should not be excessive."

1.41. At the instance of the Committee, the Department of Agriculture have furnished a statement showing the number of scientific, technical, administrative and Class IV staff in the ICAR Headquarters and the institutes and expenditure thereon for the years 1967-68, 1968-69 and 1969-70. The statement shows the following position:

(Rs. in lakhs)

Year	Scientific staff		Technical Staff		Administrative Staff		Class IV skilled/technical		Others		Total Class IV	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
1967-68	1767	125.65	1441	54.50	1739	1792	1792	28.82	2236	37.52	4028	66.34
1968-69	2412	176.91	1822	70.91	2062	88.22	2218	40.37	3145	58.77	5363	99.14
1969-70	2579	198.46	2179	83.59	2326	104.54	2519	51.08	3295	65.68	5814	116.76

1.42. At the instance of the Committee, the Department of Agriculture have furnished another statement showing the ratio between research expenditure and administrative expenditure in the various establishments of the Indian Council of Agricultural Research for the year 1967-68, 1968-69 and 1969-70. The statement shows the following position:

S. No.	Name of the Institute	1967-68	1968-69	1969-70
1.	Indian Council of Agricultural Research	1:8.86	1:9.59	1:8.99
2.	Indian Agricultural Research Institute	1:3.61	1:3.65	1:3.99
3.	Indian Veterinary Research Institute	1:5.30	1:3.43	1:3.88
4.	National Dairy Research Institute	1:2.65	1:2.24	1:2.33
5.	Central Arid Zone Research Institute	1:4.35	1:4.41	1:5.48
6.	Central Plantation Crops Research Institute, Regional Station, Vittal	1:4.32	1:3.50	1:6.86
7.	Central Plantation Crops Research Institute, Regional Institute, Kayangulam	1:4.57	1:4.07	1:3.44
8.	Central Plantation Crops Research Institute, Kasaragod	1:3.72	1:3.97	1:3.86
9.	Cotton Technological Research Laboratory	1:3.31	1:3.12	1:3.00
10.	Indian Grassland & Fodder Research Institute	1:14.84	1:12.44	1:11.53
11.	Institute of Horticultural Research	1:17.00	1:8.24	1:4.02
12.	Jute Agricultural Research Institute	1:5.61	1:4.52	1:5.02
13.	Jute Technological Research Laboratory	1:2.70	1:3.21	1:3.60
14.	Indian Lac Research Institute	1:3.70	1:2.61	1:2.53
15.	Central Potato Research Institute	1:5.84	1:7.07	1:8.32
16.	Central Rice Research Institute	1:5.56	1:6.31	1:5.81
17.	Central Sheep & Wool Research Institute	1:8.97	1:8.21	1:8.39
18.	Central Tobacco Research Institute	1:4.32	1:3.75	1:3.86
19.	Central Tuber Crops Research Institute	1:3.35	1:3.35	1:2.69
20.	Central Inland Fisheries Research Institute	..	1:5.88	1:5.07
21.	Central Marine Fisheries Research Institute	..	1:3.67	1:3.63
22.	Central Institute of Fisheries Technology	..	1:2.81	1:4.99
23.	Soil Conservation Research Demonstration & Training Centre	..	1:2.38	1:2.67

*These Institutes/Centres were with the ICAR for the full year from 1968-69.

S. No.	Name of the Institute	1967-68	1968-69	1969-70
**24.	Central Soil Salinity Research Institute	..	..	1:6.07
**25.	Sugarcane Breeding Institute	..	..	1:5.17
**26.	Indian Institute of Sugarcane Research	..	..	1:4.33

1.43. The Committee desired to know the principle followed by the I.C.A.R. Headquarters in creating posts on Government and Research sides from time to time and how funds were provided for meeting the expenditure. In a written reply, the Department of Agriculture (ICAR) have stated:

“In terms of the Government Resolution constituting the Council, the Secretariat for the Council was to be provided by the Government. Accordingly, the ICAR Secretariat functioned as a Department of the Government of India till January, 1939. Thereafter, its status was changed to that of an Attached office of the Department of Agriculture, which it continues till to-date.

Although the Government of India was responsible for providing the Secretariat of the Council (administrative, ministerial posts etc.), the ICAR Constitution did not debate the creation of technical posts in the various research schemes undertaken by the Council either at its headquarters or in the various States, Universities or private institutions. Accordingly, ever since the inception of the Council, a number of technical posts were created and the expenditure thereon was met from the research funds allocated to the particular scheme. Until 1947, the composition of the Secretariat of the Council was in accordance with the terms of the Constitution of the Council, excepting certain isolated ministerial posts which came to be created along with the schemes for looking after the clerical and accounts work in those schemes. As the income of the Council from the cess proceeds under the Agricultural Produce Cess Act, 1940, increased and a large number of grants were also sanctioned by the Government of India, it became necessary to create more ministerial posts for keeping the accounts of the funds and expenditure therefrom. After the independence of the country, there was an overall increase in the activities of the Council and the Council itself undertook the implementation of a large number of schemes at its headquarters i.e. publicity

**Two Sugarcane Research Institutes and Central Soil Salinity Research Institute were added during the year 1969-70.

and statistical schemes. A large number of ministerial posts had, therefore, to be created in connection with the working of these schemes. After 1954, the activities of the Council further expanded. Since the creation of posts in the different cadres was a laborious process and the activities of the Council continued to expand and multiply, it became necessary to create more ministerial posts expeditiously, which was done on the non-Government (Research) side of the Secretariat.

The Government of India decided on 30th March, 1965 to reorganise the ICAR so as to make it a fully autonomous organisation for promoting, conducting, coordinating and guiding agricultural (including animal husbandry) research and education throughout the country. As part of the scheme of reorganisation, amongst others, the following decisions were also taken:

- (i) The various Central Research Institutes, then administered directly as subordinate offices by the Department of Food and Agriculture, be transferred to the administrative control of the reorganised Council;
- (ii) The ICAR should assume the research functions and activities of the erstwhile Central Commodity Committees (including the administrative control of the Commodity Research Stations).
- (iii) The ICAR shall have its own Secretariat and office.

Action was accordingly taken to implement the above decisions. It was decided that the present ICAR Secretariat, which is functioning as an Attached Office of the Department of Agriculture may be converted into an office wholly financed and controlled by the Council, from a date to be appointed. Following the Government decision that the ICAR shall have its own Secretariat and Office, all posts after 1st April, 1965 have, as a matter of policy, been created on the non-Government side, excepting the senior administrative posts of and above the rank of Under Secretary which have been created on the Government side. The present position, therefore, is that whereas the ICAR Secretariat is functioning as an Attached Office of the Department of Agriculture being manned by the Government staff, a large number of technical, administrative and ministerial posts also exist simultaneously on the non-Government (research) side of the Secretariat.

While the expenditure on the Government side of the Secretariat of the Council has all along been met from the grants given by the Government of India, the expenditure of the research side staff was a charge on the cess funds of the Council till 1967-68. However, from 1st April, 1968, the expenditure of the research side staff is also being met from the Government grants.

With the decision to convert the ICAR Secretariat into a wholly non-Government office, option documents for ascertaining the willingness or otherwise were served on all Government staff (scientific, technical and ministerial) excepting the senior administrative personnel of the rank of and above Under Secretary. All the eligible ministerial staff (i.e. Section Officers, Assistants, Upper Division Clerks, Lower Division Clerks and Stenographers) were asked to give their final option on or before the 15th May, 1970. Except in the cadre of Lower Division Clerks, about 50 per cent of the Government staff in other categories, i.e., Section Officers, Assistants, Upper Division Clerks and Stenographers, as against the number of Government posts existing in the Council, have opted for the Council's service.

As a first step towards the amalgamation of the two cadres, the Government staff, who have opted for Council's service, have been appointed under the Council, on notional foreign service and are now being treated as the Council's employees for various purposes. They will be appointed as the regular employees of the Council from the date from which the ICAR Secretariat is converted into wholly non-Government office."

1.44. During evidence the representative of the Council stated that a ticklish question arising out of amalgamation was how the seniority of the staff in the emerged cadre should be determined. One view was that it should be based on the overall length of service and the other view was that it should be based on the seniority in the grade. In some cases promotions were quick but in others it was not so. It was finally decided that seniority in grade should prevail. This decision was taken after hearing the staff representatives of each side. The Secretary, Agriculture had handled the matter himself. The witness added: "Of course it is possible that some individuals suffer in any such amalgamation. We have yet to arrive at an arrangement which may be considered ethically fair and which will cause the least disturbances to the largest number of individuals." When the Committee pointed out that the research side should not suffer as a class, the Director General replied: "I shall see that fair attitude is shown."

1.45. The Committee find that with the reorganisation of the Indian Council of Agricultural Research, there has been considerable increase in the expenditure on the administration. The administrative expenditure of the Council increased from Rs. 40.14 lakhs in 1966-67 to Rs. 71.80 lakhs in 1969-70. The Committee feel that the administrative expenditure of the Council needs to be reviewed with a view to putting it under check and making sure that the increase was commensurate with the expansion of the activities of the Council and the resultant benefits.

1.46. From the data furnished to them, the Committee find that the administrative staff of the Council and the various research institutes etc. has been increasing from year to year. The total administrative staff increased from 1739 in 1966-67 to 2326 in 1969-70. Class IV (Non-technical) staff increased from 2236 in 1967-68 to 3295 in 1969-70. During the year 1969-70 as against 2579 scientific staff, there were 2179 technical staff, 2326 administrative staff and 5814 Class IV staff (2519 skilled/technical and 3295 others). The Committee have also been furnished with a statement showing ratio between administrative expenditure and scientific expenditure at the headquarters and the research institutes of the Council. The Committee find that the ratio varies from institute to institute. While the ratio between administrative and scientific expenditure was 1:2.33 in the National Dairy Research Institute during 1969-70, it was 1:11.53 in the Indian Grassland and Fodder Research Institute. The ratio of expenditure varied in the same institute from year to year. In the Institute of Horticulture Research this ratio ranged from 1:17.00 in 1967-68 to 1:8.24 in 1968-69 and 1:4.02 in 1969-70. The Committee feel that not only there is considerable increase in the administrative, technical and Class IV staff but also their proportion to the scientific staff seems to be on the high side. The Committee, therefore, desire that staff position in the headquarters of the Council as well as in various research institutes should be reviewed by an independent organisation with a view to assessing the requirements. That organisation should also lay down guidelines or norms regarding ratio of scientific, technical and administrative staff for the various institutes. The imbalance in staff should be suitably corrected.

1.47. The Committee regret to note that there is delay in the reorganisation of the Secretariat of the Indian Council of Agricultural Research. It was decided in March, 1965 that the present ICAR Secretariat which is functioning as an attached office to the Department of Agricultural might be converted into an office wholly

financed and controlled by the Council from a date to be appointed. The Secretariat, however, continues to be an attached office of the Department of Agriculture being manned by partly Government side staff and partly by non-Government (Research side) staff. The Committee desire that the amalgamation of Government side staff and non-Government side staff should be expedited. The Committee hope that while fixing the seniority of the staff it will be ensured that the research side staff do not suffer.

CHAPTER II

RESEARCH PROGRAMMES

All-India Coordinated Research Projects

The ICAR was set up in 1929 for promoting, guiding and co-ordinating agricultural (including veterinary) research and education throughout India. Some coordinated scheme, for instance, rice breeding scheme, maize breeding scheme, pulse breeding and coordinated wheat rust scheme (Mycology and Botany) were started in 1951-52. However, these schemes neither covered all agro-climatic regions of India, nor had any Project Coordinator for effective co-ordination of the research work. The first endeavour to coordinate a research project on national level was made in 1957 when coordinated maize breeding scheme was started. Seeing the evolution of high-yielding maize hybrids in a short period, this pattern, which had several unique features, was adopted for other projects pertaining to crop sciences and animal sciences. The continuing coordinated research schemes on rice, wheat, pulses were expanded and re-oriented according to the new pattern wherein multi-disciplinary, zonal or regional research and pooling of research talent from all over the country under the leadership of the national Project Coordinator were the main features. Thus, in 1965, all-India coordinated projects on rice, wheat, sorghum, bajra, maize and pulses have been started. In 1968-69, the number of such projects increased to 29. During the Fourth Five Year Plan, 60 such all-India coordinated projects will be in operation.

2.2. The Committee desired to know the measures taken to avoid over-lapping of research work done by the Council and the State Governments. In a written note, the Department of Agriculture (ICAR) have stated: "The launching of All-India Coordinated Research Projects on important problems aims at coordinating the research effort throughout the country and is thus a big step in avoiding duplication of research effort by Central and States Institutes. The Central Institutes, the Agricultural Universities and the State research centres collaborate in this joint venture. Annual workshops are organised for the All-India research projects in which scientists engaged in carrying out research work, both at the Centre

and in the States, join to discuss problems relating to specific projects. The council also arranges seminars and conferences on discipline basis to enable the scientists to exchange views as it assists in coordinating research work. Moreover, the ICAR helps different learned societies to strengthen their functioning and to organise conferences and meetings.

The Annual Reports embodying the research work being carried out by different Institutes are placed before the Scientific Panels primarily for coordinating research work. These Scientific Panels comprise of outstanding scientists working in the Central Institutes and the State Research Organisations.

The scientists from the Council's headquarters and Central Institutes serve on research committees set up by Agricultural Universities and State Departments. This also helps in avoiding duplication of research.

With a free exchange of reports of research work between States and Central Institutes, the duplication of research work is avoided."

2.3. It has been stated that the following steps are proposed to be taken to avoid overlapping of research work done by the Council and the State Governments:—

- (i) The Council will obtain, compile and disseminate information about the research projects being executed both by Central Institutes and by the State research centres.
- (ii) The Council is planning to collect information about research achievements made throughout the country, i.e., by Central Institutes, Agricultural Universities, State Research Stations and private institutes and will bring those out in the shape of a report showing agricultural research work being done in the country. The information about research work being done in the country at every place will thus become available in a consolidated form and will come to the knowledge of research scientists and research administrators. This will help greatly in accelerating the tempo of research work as well as eliminating duplication of research work.

2.4. In another note, Department of Agriculture (ICAR) have mentioned the following measures adopted for achieving coordination with other organisations in the country:

- (1) Inter-organisational meetings to discuss problems of mutual interest and to achieve coordination and avoid duplication. An inter-organisational Conference sponsored by the ICAR was held in September, 1969. Representatives from CSIR, Atomic Energy Establishment, ICMR, Coffee Board, Tea Board, etc., participated in the conference.
- (2) *Organisation of inter-institutional research projects:* A recent example of such a project is the establishment of a laboratory for the use of nuclear tools in agriculture under the joint auspices of Indian Agricultural Research Institute, Indian Veterinary Research Institute, National Dairy Research Institute and Bhabha Atomic Research Centre.
- (3) Provision of the services of I.C.A.R. scientists on the Advisory Committees of other organisations such as C.S.I.R. and B.A.R.C. For example the Director, I.A.R.I. is the Chairman of the Food and Agriculture Committee of the Atomic Energy Department and in this way a close liaison is established.
- (4) Organisation of a series of national seminars and symposia on topics of relevance to agricultural research and education to which scientists belonging to different organisations are invited.

2.5. The following measures are taken to have coordination with the research done in other countries:—

- (1) Through a memorandum of understanding with the Rockefeller Foundation, material developed in other international programmes such as at the International Centre for Research on Wheat and Maize in Mexico and the International Rice Research Institute in the Philippines are obtained.
- (2) Several bilateral agreements entered into by the Government of India such as those with U.S.S.R., Canada, France and the U.S.A. are fully utilised for exchange of scientists and material.
- (3) Participation of I.C.A.R. scientists in International Seminars, Symposia and Conferences. Though this method, a close watch is kept on recent advances in the various disciplines related to agriculture and personal contacts between our scientists and those working abroad are established.

- (4) Provision of the services of our scientists to serve on the Management Boards of International Research Organisations, for example, the Director General, I.C.A.R. and the Project Coordinator, All-India Rice Improvement Project both serve as trustees of the International Rice Research Institute in the Philippines. Similarly, several other scientists of the I.C.A.R. serve on different councils of scientific bodies in different parts of the world.
- (5) Coordination in the field of Post-graduate education in agriculture has been achieved through joint training programmes. For example, I.A.R.I. and ten different U.S. Universities have a joint Ph.D. training programme which permits the selected candidates to spend one year in a U.S. University and complete the rest of the programme at I.A.R.I. Other Agricultural Universities in India are also being brought within the scope of this joint training programme. Also, joint training programmes have been developed with the International Rice Research Institute, Manila, the International Institute of Seed Pathology, Copenhagen, etc. These joint training programmes have made it possible to provide high level training to our post-graduate research workers.
- (6) Bilateral agreements for studying specific research projects are also being established. For example, a project for research on Dry and Farming has been proposed for being undertaken jointly with the help of Canadian scientists. Arrangements have also been made to associate one university in U.S. with each one of our agricultural universities so as to provide for visiting professors, training programmes and exchange of material and the supply of equipment.
- (7) Special arrangements are made to introduce the latest techniques in agriculture. For example, the 'remote sensing technique' involving infra-red photography from the air was used recently to study the wilt disease of coconut with the help of the school of forestry, Berkley, U.S.A.

2.6. The Committee appreciate that the launching of All-India Coordinated Research Projects on important problems is a big step in avoiding overlapping of research efforts by different agencies in the country. All India Coordinated Research Projects were launched in 1965 on rice, wheat, sorghum, bajra, maize and pulses under the leadership of the National Projects Coordinator. In 1968-69, the number of such projects increased to 29. The Committee

hope that the target of 60 projects during the Fourth Plan will be achieved. The Committee would like to watch the progress in this regard.

2.7. The Committee note the other measures taken by the ICAR to establish coordination with State Government institutions, Agricultural Universities and other organisations, like collation of research information, organisation of symposia etc. The Committee desire that the impact of these measures on strengthening the research work should be kept under review so that these can be suitably modified/augmented in the light of experience.

2.8. The Committee desire that in view of the general problem of low yields in the country, the Council of Agricultural Research should examine whether the present machinery for studying the methods followed and research work done in other countries requires strengthening.

Role of Central and State Institutions

2.9. The High Level Committee of the Ministry of Food, Agriculture, Community Development and Cooperation (1962) made the following observations regarding the role of the Central and State Institutions:

- (a) There is an urgent need to define precisely the roles of the Central and State institutions and of the ICAR in the sphere of agricultural research;
- (b) Central institutions should be quality institutions concerning themselves with national problems and fundamental research including methodology and testing of innovations released in other countries. They should not establish branch stations but should avail of facilities existing at regional/state stations in the execution of their programmes.

2.10. During evidence, the Director General, ICAR, stated: "By and large our understanding is that the Central institutes will take up national problems which over-ride State boundaries." Citing the example of wheat, he stated: "Its greatest problem is the rust disease. It has three varieties: white, brown and yellow, and within each there are a number of varieties. Some one has to keep track of these for the benefit of all the people in the country. That is also one reason why some substitutions are absolutely necessary. In order to keep track of the wheat rusts, we have stations at Simla and at Wellington in the Nilgiris. Then a recent phenomenon has been coming into existence—probably mostly after this report was written—of agricultural universities. We are supporting agricultural universities also because we believe it is based on very good plan

where research and education in agriculture come together. We are taking into account the fact that we have agricultural universities and we have State Department of Agriculture."

2.11. He added: "In order to speed up our plant breeding work, to have still better high yielding varieties, we take advantage of the fact that we can grow second crops of wheat in the summer in the Nilgiris. We have got a station at Wellington where we grow an extra crop in summer and we make this facility available to all the wheat breeders in the country. As far as possible, we make use of the existing institutions and give preference to the Agricultural Universities."

2.12. The Committee appreciate they by and large the Central Institutes take up research on National problems which override State boundaries. In view of the fact that different agencies e.g. Central Institutes, State Institutes and agricultural universities are at present doing research work, the Committee feel that it is necessary to lay down some guidelines regarding roles of these agencies with a view to avoiding duplication.

Review of Research Stations

2.13. The High Level Committee of the Ministry of Food, Agriculture, Community Development and Cooperation recommended that it was necessary to classify the existing research stations, reduce their number, where necessary, to avoid duplication or improve quality and to develop and strengthen them on a regional basis wherever possible. The Study Team of A.R.C. on Agricultural Administration recommended: "A review of all the Research Stations and Farms currently being run by the Centre should be made by competent experts and action should be taken to close down such of the stations and farms which are not running on reasonable standards and the remaining should be handed over to the States. The Centre should only maintain national and all-India institutions and farms."

During evidence, the Director General, ICAR, stated: "It has been the policy of ICAR not to start any new research stations unless it is inevitable. There may be some circumstances where a new station may be necessary. For example, Kashmir has asked us to help them pointing out that if we merely give them a grant, that will not help them because they will not be able to get the new necessary personnel. So we are setting up a regional station. But, by and large, our policy is not to set up new stations. Also, we had a meeting of Central Directors where we decided that, first of all, each

institute will do its own scrutiny as to whether it needs all the stations it has got and, secondly, in terms of reference for Achievement Audit Comments which examine each Research Institute once in every five years, this task has been specifically assigned. The problem also pertains to research centres in the States and about four years ago the Minister of Food and Agriculture addressed a letter to agricultural universities and to State Governments suggesting that they should review the number of technical research centres under their control and bring it down to a smaller number in order that they should be properly looked after with competent staff, good library and good apparatus, and so on. The replies received indicate that they are giving consideration to this Punjab said that they had already done this. So, this subject is receiving attention."

2.14. At the instance of the Committee, the Department of Agriculture (ICAR), have furnished a copy of a circular letter dated 14.5.1965 addressed by the Minister of Food and Agriculture to the Agriculture Ministers of States expressing the need for small number of well planned research stations in the States. In his letter, the Minister of Agriculture had stated: "The several Committees appointed during the last ten years to review the progress of agricultural research in our country had all suggested that to get the maximum return from the technical and financial resources deployed, it is essential to carry out the work in a concentrated and intensive manner rather than in small isolated stations widely dispersed all over the country.....The scope as well as the need for such a review are obvious from the fact that while in a country like the United States there are only about 200 agricultural research stations, we have over a thousand in India. Most of our stations are both ill-equipped and inadequately staffed. The staff also change frequently, a feature which itself is partly a consequence of the innumerable research stations we have. Had there been a small number of well planned research stations, such a rapid migration of technical personnel as well as dispersal of the meagre resources available could have been avoided... The scientists panel has suggested, that hereafter all agricultural research should be carried out through the coordinated projects involving cooperation between Central and State institutes rather than through the establishment of sub-stations of central institutes. This would imply that we should develop very strong centres of research in all the States. In view of its importance for gearing up the tempo of agricultural research, I do hope you will initiate a serious study as well as speedy action on this question. I need hardly say that the transition from a primitive form of agriculture to a science-oriented one which we aspire to bring about would require more intensive and effective research and not less."

2.15. In a written reply, the Department of Agriculture (ICAR) have stated that at a meeting of the Directors of Institutes held on 7th June, 1970, the following decision was taken regarding the need for effective supervision over and coordination of the activities of the regional sub-stations by the Central Institutes:

"An assessment should be made of the role played by each regional or sub-station of the I.C.A.R. Institutes and the purpose served by each. Wherever it was felt that the sub-station served a useful purpose and was not duplicating the work of State agency, such stations should be kept. Regarding others, recommendations may be made to the ICAR for winding up or handing over the stations to the appropriate State agencies."

The proceedings of the Directors' Conference which contain the above recommendation have been sent to the Directors of the Research Institutes for necessary action.

2.16. Explaining the functions of some of the Research Centres, the Director, Indian Agricultural Research Institute stated: We have a Soil Correlation Centre, Bangalore. It is just outside the agricultural university. The purpose of the Centre is that as the entire Indian soils have been divided into four groups, this centre caters to the need of laterite soil that is present in Mysore, Andhra Pradesh, Kerala and Tamilnadu. This Centre works for the entire region.

Last year they prepared a detailed soil correlation and land use map for the Rayalseema Development Board of the Andhra Pradesh Government. In other words although the Centre is located in a particular campus, its own function is beyond that particular state. It transcends and covers that entire region and thus we have a centre which is located in the Coimbatore College within the area of the proposed Tamilnadu Agricultural University. This centre provides for off-seasonal facilities for millets and cotton. Take the crop of Jawar, Bajra or Maize. If we harvest the crop in October, we send the seed in November to Coimbatore. In January-February it might go to Bangalore where they maintain the crop. In fact these centres provide us an opportunity to take the maximum advantage of the climatic variability in our country. In foreign countries such crops are grown in phytotron the climate house in which you can reproduce in any given climatic condition. We use the natural climatic variables in the country, as the Europeans use phytotrons.

Bhowali Agricultural Station has been established because there is very severe rust infection. Whether it is from Madras or

Maharashtra or from Gujarat, they are all brought there and grown at Bhowali Station as there is a very good infection with rust. Brown rust comes and this provides an opportunity for all the other stations in the country to get material tested. These regional or sub-stations have a servicing role in all-India Projects. Certain centres might have lost their necessity or utility. A constant review is being made in this regard.

Agricultural University will take a regional task. Many of the ICAR stations work beyond a particular State. They help a number of stations all over the country.

In the next few years the position will be reviewed and it will be seen whether the Centre and Universities accomplish the same purpose.

2.17. The Director General, ICAR, stated: "There is one particular point i.e. we recruit persons from all-India. We have, therefore, got very competent staff. Universities tend to recruit local people. We have to see whether the type of work being done can be carried out by others. If it can be, we will hand it over but it requires careful examination."

2.18. The need for reviewing the existing research stations currently run by the Centre has been emphasised by the High Level Committee of the Ministry of Food and Agriculture in 1962 and the Study Team of the Administrative Reforms Commission in 1967. In his letter addressed to the Agriculture Ministers of the States in 1965, the Minister of Food and Agriculture while pointing out the need for review of the research stations of States observed: "The scope as well as the need for such a review are obvious from the fact that while in a country like the United States there are only about 200 agricultural research stations, we have over a thousand in India. Most of our stations are both ill-equipped and inadequately staffed." The Study Team of A.R.C. have observed: "A review of all the Research Stations and Farms currently being run by the Centre should be made by competent experts and action should be taken to close down such of the stations and farms which are not running on reasonable standards and the remaining should be handed over to the States...The Centre should only maintain national and all-India institutions and farms." The Committee have been informed that at a meeting of the Directors of Institutes held in June, 1970, it was decided that an assessment should be made of the role played by each regional or sub-station of the I.C.A.R. Institutes and the purpose served by each. Wherever it was felt that

the sub-station served a useful purpose and was not duplicating the work of State agency, such stations should be kept. Regarding others, recommendations may be made to the ICAR for winding up or handling over the stations to the appropriate State agencies. The Committee regret that although the need for reducing the number of research stations has been felt for a long time, no concrete steps has been taken towards this direction. The Committee desire that a time-bound programme should be drawn up to implement the decision taken at the meeting of the directors of the Institutes held in June, 1970, and the Committee informed of the progress made in this behalf.

2.19. The Committee desire that the question of intensifying research at Research Stations under the State Governments should also be pursued with them.

Dry Farming

2.20. The Committee desired to know about the research programme about Dry Farming in the Fourth Plan. The representative of the ICAR stated: "...realising the importance of developing technology for the dry farming area, which constitutes about 80 percent of the country, in the Fourth Plan we are taking a coordinated project on dry land agriculture. Now this coordinated project will cover most of the States where dry farming is practised. There would be 24 centres in the country. In reply to the particular question that you would like to know whether we have already developed certain technology, I would submit that already certain varieties have been developed which are suitable for dry farming. Actually, in this case our approach is two-fold. One is known technology which has been developed in the past—should be made use of. Secondly, better technology should be developed on top priority basis... Now in case of wheat, barely, jawar and bajra, we have at present some varieties which can stand the test and which gave distinctly better performance over the existing varieties even under dry farming conditions provided the new technology is used. It is not one practice but a package of practice which produce the desired effect. It means that as a first step soil and water has to be conserved, then fertiliser has to be judiciously added and suitable agro-economic practices followed. Generally, in case of dry farming conditions, there is a feeling that if we apply fertiliser, we may burn the crop but if scientific method of fertiliser application is used, the fertilizer can become an insurance against drought. Then ...the particular type of variety which is suitable for that condition that has to be produced. Here I will give an example, there is a traditional dry farming area Ballary, where a long duration 'jawar' variety used to be grown there. Re-

searches have developed the new variety CHS-I which is of a shorter duration and better yield potential. It gives there to four times the yield. That shows that we have certain varieties which can be used under dry farming conditions.

2.21. We are now trying to make use of the package practices. We have taken up this new project of coordinated dry farming project, which will cover most of the States. This project will also provide support for the dry farming development programme which the Ministry of Food and Agriculture is taking up and actually all these known practices and which have been developed in the last few years—those practices would be tested and tried under those conditions. The scientists working in the coordinated project and in the Institute would be providing the support for that purpose.”

2.22. The Director, Indian Agricultural Research Institute stated: “We try to understand, although it is very difficult to draw general inferences about weather pattern. Thanks to computers, we can try to understand as to what is the general rainfall in an area during the last 40-50 years. From that we try to develop a variety which is likely to avoid the rigorous of drought. On that basis, we selected our varieties and got them tested before they were used. We found that in hybrid jawar CHS-I in the early stages of seedlings, their roots go deep down. The male parent of this hybrid is from the United States and its grains are coarse and not of good quality. For this purpose we tried to develop what is known as CHS-3 a new hybrid jawar with good grains. One of the problems for developing jawar hybrids for drought conditions is that we had to depend on one parent which has been developed in U.S. for mechanical harvesting. But, at our Coimbatore station, we have developed our own variety of male sterile parent using the best local Indian varieties. They are of better quality and have better straw. Our farmers use this variety from which the male sterile plant was developed.

2.23. Recently for dry areas a rice strain of high yield potential has been developed at the Central Rice Research Institute, Cuttack. It is known as C.R. 42-38. It takes only 90 days to grow. One parent of this variety is Nagina 22 which also does well under upland conditions. In Tamil Nadu they have developed one variety known as I.E.T. 355 which is being tried in the U.P. region. First we try them in All-India coordinated trials and then only we release these varieties. In all these things, our idea is to see that new seeds are grown in drought areas; they are drought resistant, capable of responding to fertilisers such as nitrogen and so on. The importance of fertilizer's response lies in the fact that there is a relationship between input and output in yield. For example, to get one tonne

of rice, we have to supply the plant with 24 Kg. of nitrogen. The whole technology is available in all its details and this is a valuable document. These can be used on a large scale in the fields and can be adopted as they are or can be modified according to local conditions. In dry farming conditions, pulse crops are very important. We have now a large number of varieties of pulses which are quite good in yield and quality and which can be grown quicker. For example in *arhar*, we have varieties which can be grown in 130 days in the place of 250 days in present-day varieties. This can completely revolutionise the production of pulses in our country.

Take the case of Telengana in Andhra Pradesh. There we have released a variety of castor known as Aruna. It takes only 120 days in place of the old variety which takes about 220 days. By this, we shall be able to replace one single long duration crop with two short duration crops."

2.24. Asked whether the new variety of rice had been tried in Rajasthan, the witness replied: "Trials have been conducted in Rajasthan also. This variety has done well. Dry paddy has certain advantages. Pests and diseases are more serious in the humid, heavy monsoon areas. Under dry conditions if we have a variety with a good yield potential and if we give adequate nutrition to such varieties we can increase production substantially."

2.25. The Committee note that the Indian Council of Agricultural Research propose to launch an all-India coordinated project on dry farming during the Fourth Plan, covering most of the States where dry farming is practiced. In view of the fact that the dry land area constitutes about 80 per cent of the country, the Committee desire that the project should be made fairly comprehensive covering all the States where dry farming is undertaken.

The Committee would like to emphasize that the research efforts for improvement of dry farming technology should be made with a sense of urgency, so that the application of the improved technology in the dry-farming areas may help increase the food production.

Dissemination of Results of Research

2.26. The Committee asked about the measures taken to disseminate the results of the research to the farmer. In a written note, the Department of Agriculture (ICAR) have stated that "communication of results of research to cultivators is primarily the responsibility of the Directorate of Extension and Training of the Ministry of Food and Agriculture (Department of Agriculture). However, the Council has taken the following measures in this regard:—

National Demonstrations—Through the National Demonstration Programmes, the agricultural scientists demonstrate the latest researches in different aspects of crop production to the farmers. In 1969-70, 1330 demonstrations were conducted in the farmers' fields. During the year 1970-71, 1430 such demonstrations are to be taken up in 50 districts spread all over the country.

Publicity—On an average about four news|feature articles on agricultural research are sent out to the newspapers including Regional Languages for publication every month in Hindi and 10 Regional languages.

Press handouts are issued on important conferences, seminars, workshops and important decisions.

Special Newspaper Supplements on various aspects of agricultural research in English, Hindi and other Indian languages are brought out every year.

Results of researches are communicated to the Farm and Home Division of All India Radio and Krishi Darshan Programme of the Television Centre for dissemination.

Most of the ICAR Institutes organise Kisan Melas once or twice in a year where latest techniques are demonstrated to the farmers.

The Institutes with Extension Division have advisory services to help the farmers. Extension Division of some of the ICAR institutes have taken up extension work for helping the farmers in the adjoining areas."

2.27. In another note, the Department of Agriculture (ICAR) have stated that the following institutes have Extension Divisions:

- (1) Indian Agricultural Research Institute, New Delhi.
- (2) National Dairy Research Institute, Karnal.
- (3) Indian Veterinary Research Institute, Izatnagar.
- (4) Jute Agricultural Research Institute, Barrackpore.
- (5) Central Tobacco Research Institute, Rajahmundry.
- (6) Central Plantation Crops Research Institute, Kasaragod.

2.28. The Extension Divisions of the Institutes, in collaboration with the Directorate of Extension of the Ministry of Food and Agriculture organise courses for the extension staff working in different States. These divisions also arrange farmers' fairs and carry out extension work in the areas adjoining the institutes.

2.29. It is expected that by the end of the Fourth Five Year Plan, all the institutes excepting Animal and Plant Virus Research Institute and Soil Salinity Research Institute, will have extension divi-

sion. Whereas Soil Salinity Research Institute has just been started, the Animal and Plant Virus Research Institute will only get established by the end of the Plan. Moreover, these Institutes will be carrying out fundamental research and results for application in the field will be available after some period of time.

2.30. During evidence, the Director General, ICAR, stated: "In the Fourth Plan for all our institutes, on the agriculture side, we have provided for extension units because we feel that they are necessary. We also arrange 'Farmers Day', at our institutes where the farmers can see the work in progress and ask any questions for which answers are given. A panel of experts is there and the farmers ask questions and they get answers straightway. All over the country, National Demonstrations on farmers' fields are being done. In demonstrations, we use high yielding varieties which are very good. And we invite the States to participate in this also. In the fields of farmers these demonstrations show how the yield targets could be achieved. The results were so good that in most cases the target had exceeded. At first the demonstrations were for simple crops but now multi-crop patterns are being demonstrated. Still more research is being done. And it has now been felt that where we have these first-class demonstrations, there are places where you can train the farmers who are invited to come from surrounding areas. Arrangement is made for competent staff to explain to them the various procedures for growing high yielding varieties. These are very useful to them." The witness further stated: "Though extension at the Centre comes within the purview of the Department of Agriculture, but we do keep in touch with them. The Department of Agriculture has set up Development Councils in Tobacco, and Jute and so on. The representative of the ICAR attend such meetings and they keep a note of any fresh problem that comes up so that research and work for its solution can be taken up."

2.31. The Committee asked about the nature of problems referred to the Council. The Director, Indian Agricultural Research Institute, replied: "The problems are of various kinds. We receive queries from farmers, field extension staff and block development officers. Some of the problems even go to the agricultural universities. Last year in Bihar, there was a lot of damage done to the crop in Saharsa-Purnea area by an epidemic. The State Agriculture Department was interested in getting top-level scientists and a group of scientists, virologists and plant pathologists went from IARI and also from the Central Research Institute at Cuttack. They suggested some immediate remedial measures as well as some long-term measures. This year also there are possibilities of the same epidemic

there and we have given them advance information as to how to meet it. The ICAR also receives queries about various new diseases, pests, etc. from various parts of the country."

2.32. In a note the Department of Agriculture (ICAR) have stated that a number of problems in the field of agriculture and animal husbandry are continuously referred to the ICAR institutions by State Departments of Agriculture, Extension Directorate of the Government of India, Agricultural Universities and also farmers. Many such problems relate to the incidence of diseases and pests, suitability of varieties and soil fertility problems. These are attended to immediately and suitable corrective measures are suggested. In addition to the provision of such consultancy services, special surveys are also made as and when there is a need. A few examples are given below:—

- (a) Soil survey and land use maps are prepared constantly for the use of various State Governments. Soil Conservation Boards and River Valley Development authorities. A special report on land use planning for the Rayalaseema region of Andhra Pradesh was prepared in order to help in the scientific planning of agricultural development in this economically backward region
- (b) Whenever there are serious pest epidemics, special studies are undertaken. For example, a detailed survey of the Jassid out-break in paddy in Bihar and U.P. during the Kharif season of 1969 was undertaken.
- (c) A constant survey and surveillance of major diseases like wheat rust, paddy blast, etc., are undertaken and newsletters are issued giving up-to-date information to the State Departments on the disease situation and on the advance action that should be taken to prevent the spread of the disease.
- (d) Special problems such as those relating to Dry Land Farming are also taken up for survey and study. A recent example is the standardisation of a technique for supplying nutrients to unirrigated wheat crop. A pilot study undertaken in the Kota District of Rajasthan showed that by the supply of even 10 Kg. of nitrogen per hectare through foliar feeding the yield of wheat could be increased from about 6 quintal per hectare to about 10 quintal per hectare."

2.33. The Committee asked whether the ICAR had set up any pilot projects to test the results of research. In a written reply, the Department of Agriculture (ICAR) have stated: "In respect of the

newly developed varieties and techniques for maximising their yield per acre, maximum potential plots incorporating all the improved practices are laid out at the Central Institutes as well as the research centres located under the All-India Coordinated Crop Improvement Projects. This enables the new variety on the yield potential on a sizeable area. It also provides material for the training of the farmers.

The new strains as well as the agronomic and plant protection practices are demonstrated in the cultivators' fields by the scientists themselves under the National Demonstration Scheme. The area of such plots is kept at least one acre each. The national demonstrations are conducted under the direct supervision of research scientists of the universities or research institutes in collaboration with the extension agency of the State in order to effectively demonstrate the efficacy of the research findings. Started originally to demonstrate the highest yield potential of individual crops under farmers field conditions, the scheme was subsequently enlarged to cover multiple cropping adopting the concept of maximum production per unit area per annum. Impressed by the results of this approach, Government of India has asked the ICAR to run this project in 100 districts on an intensive and in other districts in extensive scale. The subject matter specialists are also being provided in all those 100 districts so as to create a full technological impact. The project also provides base for the training of farmers and use of rural radio for transmitting the observations to larger number of farmers. It may not be out of place to mention that the Department of Agriculture of the Ministry of Food and Agriculture, Government of India, has planned pilot projects in different States to popularise the technology of multiple cropping emerging from the national demonstration.

Some of the techniques like spray application of urea on wheat developed by IARI has been tested on a pilot scale with the help of the State Department of Agriculture, Rajasthan and Madhya Pradesh and the Department of Agriculture, Government of India. The results of pilot demonstration show the effectiveness of the technique for rainfed wheat in those areas."

2.34. From the information furnished to them, the Committee gather that the communication of results of research to cultivators is primarily the responsibility of the Directorate of Extension and Training of the Ministry of Food and Agriculture. The Committee find from the Report of the Study Team of the Administrative Reforms Commission that "as it is organised today, the Extension Directorate is handling functions most of which are entirely the responsibility of the States." The Study Team have recommended

that "the Directorate of Extension in the Ministry of Food, Agriculture, Community Development and Cooperation should be abolished forthwith. Functions relating to international aspects, national obligations and responsibilities pertaining to extension and coordination among the States should be handled by a top level technical specialist in extension of the rank of Joint Secretary. He should work in close coordination with the ICAR." The Committee attach utmost importance to the communication of the results of research work to the farmer and would like the Government to consider whether any change in the set-up is necessitated to handle this task.

2.35. The Committee note that five institutions of I.C.A.R. have extension services and it was proposed to provide extension units to almost all the institutes during the Fourth Plan. The institutions of the ICAR also communicate the results of research to the farmers through National demonstration, publicity in newspapers and attending to the problems of farmers. The Committee hope that the extension work by the I.C.A.R. will be done in close coordination with other organisations and made really effective.

The Committee suggest that it should be examined whether adequate arrangements exist for the practical training of farmers so that they may adopt improved technology to increase agricultural production.

Evaluation of the work done by the Institutions of the Indian Council of Agricultural Research

2.36. The Committee desired to know whether any evaluation of the working of different research institutes under the Council had been undertaken by an independent agency. In a written reply, the Department of Agriculture (ICAR) have stated: "There has been a periodic evaluation of the working of most of the Research Institutes under the Council by special Achievement Audit Committees constituted for the purpose. . . . The Council has also taken a recent decision that the work done by the various research institutes under its control should be subjected to quinquennial review by high-powered Achievement Audit Committees composed of eminent scientists specially selected for the purpose. The first batch of reviews is expected to be commenced during 1970-71 and all the institutes under the Council will be covered in the course of two to three years."

2.37. The Committee suggest that the High Powered Achievement Audit Committees proposed to be set up to review the working of the various research institutes would also include some scientists from outside the Indian Council of Agricultural Research.

CHAPTER III

AGRICULTURAL AND DAIRY RESEARCH

The Committee have been furnished with detailed notes on the research work done in respect of wheat, rice, jute, cotton, oilseeds and dairy science and its impact on increase in production during the years 1967-68, 1968-69 and 1969-70.

Wheat

3.2. The introduction of the new dwarf varieties of wheat heralded an era of increased production in the country. Though these new dwarf varieties imported from Mexico were high yielders, the quality of the grains was comparatively poor. The grains were red-coloured and the 'chapati' making quality of these new wheats was not very much liked by the consumers. Immediate research was hence taken up after the release of the new exotic dwarfs to produce a new variety as high yielding as the exotics with the additional characteristic of good grain. A new amber-coloured, dwarf, high yielding variety (Sharbati Sonora) was evolved by irradiating the dwarf mexican variety (Sonora 64). This new amber variety resembled the original parent in its yielding ability and disease resistance properties in addition to having the desirable grain character. Further it contained a higher amount of lysine, one of the important protein components for growth. Followed by the release of this variety, a number of amber-coloured, hardgrained wheat varieties have been related during the years 1967-70. They are kalyansona, sonalika, safed lerma and chhoti lerma. All these varieties are dwarf with high yielding potential and they have the desirable grain qualities required by the Indian consumer. The agronomy for growing these new dwarfs differed from the ones that is adopted for the local varieties. For example, the new dwarfs when sown deep like the tall Indian wheats did not give high yields. Researches on the agronomy of growing these dwarfs have resulted in the optimum depth of sowing for these new wheats and the number and time of application of irrigation to obtain the maximum yield potential of these crops. These results have been passed on to the producers and the large increase in the production of wheat which is often called wheat revolution during the past years is proof of the efficacy of the results of research that have accrued from

these projects. Further, new cropping schedule has been evolved which became necessary due to the short duration of the new wheats.

3.3. An inservice training course for a duration of 4 weeks was conducted for training the active research workers in wheat breeding from 1966-67. The training course was organised at the Indian Agricultural Research Institute where the Project Coordination of the All India Coordinated Wheat Improvement Project is located. No additional expenditure other than the amount sanctioned for the All India Coordinated Project was involved in this training. So far 7 wheat breeders from the States have been trained under this programme.

3.4. The Committee asked whether research had been done to produce protein rich variety of wheat. The Director, Indian Agricultural Research Institute, stated: "The protein content is one of the criteria for selection of varieties which we have raised and the protein property of wheat has to be both from the nutrition point of view as well as from the chapati making point of view. We have to study the physical properties and chemical properties. It has been our aim to increase the protein-content without affecting in any way either the yield or the chapati-making property or bread-making property. Our first variety was released in 1967—Sharbati Sonera—which has 15 per cent protein content. The local varieties have 12 to 10 per cent protein while the Sharbati Sonera has 16 or 16.5 per cent. We are developing wheat varieties which will have 18 per cent protein. We hope we will be able to release one variety with both high protein as well as the amino acid lysine which is very important for vegetarian diet. We have found some of the minor millets have excellent protein but unfortunately the digestibility of protein is very poor. We are trying to eliminate this difficulty. In regard to wheat, one variety has already been released. Several other new varieties will be released. But sometimes the plant may have an inherent property for high protein but it may not pay for the farmer, because the farmer gets the same price whether he grows the wheat with 15 per cent or 10 per cent protein. That is why in other countries like United States there is a premium for protein-content in the pricing policy. If that is introduced here also, there will be a real inducement to grow more protein-rich wheat." Asked if the ICAR had taken up the question with Government, the witness replied: "There is a price commission. At present they are using the market classification which goes by colour—red wheat, white wheat, etc."

3.5. In a written reply, the Department of Agriculture (ICAR) have stated that total production of wheat has increased from 113.93

lakh tonnes in 1966-67 to 165—40 tonnes in 1967-68 and 186.52 lakh tonnes in 1968-69.

3.6. The Committee desired to know the present level of production per hectare in India and other countries. The Department of Agriculture (ICAR) have furnished the following information :—

Country	Yield per hectare in Kilograms
Australia	830
Canada	1320
Pakistan	810
U.S.S.R.	1160
U.S.A.	1740
India	890

3.7. India occupies the second position in its low yield. The latest average of wheat yields have been reported round about 1250 Kg/ha which are yet to be officially confirmed. This average yield compares favourably with other countries.

3.8. With regard to the future research programme, it has been stated that the new dwarf wheat varieties are capable of giving high yields. Still higher yields seem to be possible with a shorter plant type that can stand (without lodging) very high fertilisation. Such dwarfs (3-gene dwarfs) are in the assembly line and need to be intensively tested for agronomic and other characters at a large number of locations. Moreover, there is a demand for somewhat shorter duration varieties so that the farmer can follow greater intensity of cropping. This view is receiving attention.

3.9. Growing of the new high yielding strains under extensive cropping conditions may lead to micronutrient deficiency which may limit yield. Intensification of research on the micronutrient requirement of this crop is necessary and already a coordinated scheme on micronutrient is investigating this problem.

3.10. Upto now yield increases have been obtained mostly under irrigated conditions. Efforts have to be made to evolve varieties and suitable agronomic schedules for raising the yield of the wheat grain under barani conditions. Physiological studies may have to be taken on the physiology of drought and evolve varieties which may stand moisture stress conditions.

3.11. Industry requires different types of wheat which are needed for the manufacture of wheat products like samolina, noodles, biscuits, etc. Steps have to be taken to study the type of wheat required for the manufacture of these products and evolve varieties with those characteristics. This aspect is receiving necessary attention.

3.12. Though the present recommended high yielding varieties have better grain quality (colour, size, hardness, chapati-making quality, etc.) varieties with still better grains quality need to be evolved. Further, the protein contents of these new varieties have to be raised. The present varieties grown possess a certain amount of resistance to the rusts of wheat. Varieties with better resistance would be welcome. With the introduction of these high yielding varieties, the insect pest problem, which was not very much evident in wheat cultivation is assuming serious proportions. Insects like army worm, cut worm, aphids and borers and nematodes are evident and are likely to pose very serious problems if they go unchecked. Hence, studies on the incidence of these pests need to be taken up, alongwith suitable controlled measures.

3.13. The Committee are glad to note the good research work done by the Indian Council of Agricultural Research on high yielding new dwarf wheat varieties which has resulted in wheat revolution during the past few years. The total production has increased from 113.93 lakhs tonnes in 1966-67 to 165.40 lakhs tonnes in 1967-68 and 186.52 lakh tonnes in 1968-69. The latest average of wheat yields (1250 Kg/ha) compare favourably with other countries. The Committee hope that efforts will continue to achieve still higher yields and to meet the demand for somewhat shorter duration varieties to promote intensive cropping. Efforts should also be made to enrich the protein content of wheat. Early steps should be taken to study the types of wheat required for the manufacture of wheat products like samolina, noodles, biscuits etc.

3.14. The problem of growing the new high yielding strain under extensive cropping condition is that it may lead to micronutrient deficiency which may limit the yield. The Committee desire that research effort should be intensified on the micronutrient requirement of this crop.

3.15. The Committee are, however, concerned to note that with the introduction of the high yielding varieties, the insect pest problem which was not very much evident in wheat cultivation is assuming serious proportions. The Committee desire that serious attention should be taken up alongwith suitable controlled measures.

3.16. The Committee have been informed that upto now yield increases have been obtained mostly under irrigated conditions. The Committee consider it important that efforts should be made to evolve the varieties and suitable agronomic schedules for raising the yield under dry farming and drought conditions.

Rice

3.17. Research programmes on rice were being sponsored by the ICAR under three categories. First, the All India Coordinated Rice Improvement Project which started functioning from 1st April, 1965. The project included 22 centres of research spread all over the country. During the Fourth Plan, this project is being continued at an estimated cost of Rs. 1.6 crores. Secondly, the ICAR Institute, the Central Rice Research Institute at Cuttack have also their regular programme of work on rice. The work under the All India Coordinated Project aims at the evolution of high yielding dwarfs strains of paddy which are fertiliser-responsive and possess disease and pest resistance and good grain quality. While the work under the Coordinated Project is production-oriented research, the Central Rice Research Institute takes up basic problems for study. Basic studies, like the mode of inheritance of desirable characters, physiology of drought, salinity and disease resistance, physiologic races of the pathogens causing blast, bacterial blight and nutritional quality of grain are being undertaken at the Central Institute. Thirdly, the ICAR has sponsored some *ad hoc* schemes on rice in the State Departments of Agriculture and Agricultural and other Universities. These projects are expected to provide additional research information which are not available either at the Central Rice Research Institute or the All India Coordinated Project.

3.18. The expenditure incurred are financed mainly from the specific grants made by the Government of India to the Council. The following is the expenditure for the years 1967-68 to 1969-70:—

1967-68	..	Rs. 21.28 lakhs
1968-69	..	Rs. 41.26 lakhs
1969-70	..	Rs. 40.39 lakhs

3.19. *Number of field surveys made:* Field visits are made by the Project Coordinator (Rice) and the Joint Project Coordinator during the crop season. In addition during the year under report, a survey of insects and diseases of rice in India was made by a team of experts from the International Rice Research Institute, Mainla who are co-operating in the All India Coordinated Rice Improvement Project.

That survey was undertaken to evaluate the comparative field susceptibility to insects and diseases of the new introductions like IR-B and TN—1 and the indigenous varieties in order to project the implication of their large scale cultivation. During the survey, most of the major rice areas of the country were visited. It was noted by the team that, among the insect pests, Gallmidge appeared to be most severe of all pests of IR-8. Further it was noted that all the rice areas contained moderate populations of rice green leaf hoppers. These insects, in addition to damaging the crop, were found to transmit virus diseases. The team further felt that bacterial leaf blight is a serious yield-reducing problem in many areas in India. These findings of the survey team helped to focus the attention of the breeder to evolve varieties resistant to Gallmidge and bacterial blight. A number of lines persistent to the above are already under trial. During 1969-70, the Kharif Rice crop was effected by yellowing disease in the Eastern States (U.P., Bihar, Bengal). Survey teams consisting of a plant pathologist, entomologist, and breeders visited these areas. The above surveys indicated the presence of a new virus disease (Tungro virus) in the affected areas. The result of the survey indicated the unsuitability of the strain Padma for the Kharif season in the Eastern States. This has further led to the evolution of a new resistant variety which has been recommended, during the current year for these areas.

3.20. *New Processes Developed.*—Despite the introduction of high-yielding varieties of rice, rice production had to face some serious problems in this country, (i) the new varieties produced were coarse grains to which there was a degree of consumer resistance to some States: (ii) the new varieties did not fare as well in areas of heavy rainfall and prone to water-logging as they did under upland or well-drained conditions: (iii) the new varieties were more susceptible, since they were grown under intensive conditions of cropping and fertilisation, to diseases—like the bacterial leaf blight and the 'tungro' virus, and insect pests—like the stem borers, gallmidge and 'leaf hopper' (which is instrumental in the transmission of the tungro virus diseases) and 'plant hoppers'.

3.21. The Indian rice improvement programme is actively tackling these problems in a coordinated manner. The following are some of the important results of research:—(i) A good range of dwarf high yielding varieties possessing acceptable fine to medium type of grains have now been evolved (examples; Padma, Hamsa,

Jagannath, CRI-6, CR-10-5437, CR-44-11, IR-20 and strains derived by crossing exotic dwarf varieties with local basmati type of rices, BC-5 and BC-6; CR-44-1, in addition to possessing superior grain type, is resistant to stem borer and is recommended for areas where stem borer is a problem. IR-20 has been recommended for release in U.P., Bihar and West Bengal where rice tungro virus is a serious problem; (ii) The varieties; Pankat and Jagannath, approved for release in 1969, do very well in areas of heavy rainfall and water-logging especially in Bihar, Bengal, Orissa and Coastal Andhra Pradesh; (iii) Short duration rice varieties (CR-42-38-173, IET-400, IET-355) have been developed for growing under upland conditions (drilled and broadcast)—they can well substitute local varieties, like N. 22, Dular and others in the upland areas.

3.22. Particulars of the new strains evolved, viz., yield, duration and grain quality are given in the following statement. Out of these varieties, only Java, Padma, Hansa, Jagannath and Pankaj have been officially released for cultivation. The other varieties have been recommended by the All India Rice Workshop held recently for release and release proposals are being prepared for submission to Central Variety Release Committee:—

Name of Variety	Yield in kg/ha	Duration in days	Grain quality
Java	6891	120	Long bold white grain with good cooking quality.
Padma	3713	110	Short bold white grain with very good cooking quality.
Hansa	3495	122	Long slender white grain with very good cooking quality.
IET-400	4215	113	Short bold white grain with very good cooking quality.
CRI-6	3954	118	Medium slender white grain with very good cooking quality.
IET-355	3673	113	Short bold white grain with very good cooking quality.
CR-42-38-173	3399	107	Do.
Jagannath	3973	151	Medium slender white grain with very good cooking quality.
Pankaj	3859	149	Long bold white grain with very good cooking quality.
CR-10-5437	4009	140	White slender translucent grain with very good cooking quality.

Name of variety	Yield in kg/ha	Duration in days	Grain quality
CR-44-11	4121	120	Long slender white grain with very good cooking quality.
BC-5	3538	118	Medium slender white grain with very good cooking quality.
BC-6	3270	112	Long slender white grain with very good cooking quality.

3.23. Protection of the crops from plant diseases has been occupying the attention of the research scientists under the All India Co-ordinated Project. Chemical control of these diseases (the blast and bacterial blight) restricts incidence of the disease though it does not completely help to achieve the full yield potential of the high yielding strains. It has been noted that Kasumin (1. og) and Hinosan were the most consistent in reducing the neck infection of blast disease. Control of bacterial blight by chemical means at the moment seems to be difficult. The virus diseases can be controlled to a certain extent by keeping a check on the insect population which transmit the disease. Application of Diazinon granules applied at 5,20 and 40 days after transplanting is found to give effective control of Gallmidge. This treatment also reduces the incidence of stem-borers.

3.24. Efforts have been directed towards production of high yielding varieties with built-in resistance towards these diseases. Donors of genetic resistance to the bacterial leaf blight (i.e. la-cross Zenith Neera, Sigadis and some others) and the tungro virus disease (i.e. Pankhari 320, Latisail, Kataribhog, etc.) have been isolated and so also donors of resistance to stem borers (e.g. TKM-6) and gallmidge (e.g. Iswarkorra, Ptb. 18 etc.) and they are now being used for breeding disease and pest resistant varieties. The new strain IR-20 which is resistance to the tungro virus has been recently recommended for release by the Rice Workshop in areas affected by tungro virus viz. Bihar, West Bengal and U.P. Another variety CR-44.11 which has superior grain quality is also resistant to stem borer and has been recommended for areas where stem borer is a problem.

3.25. Agronomic schedules for the different strains released under the programme are formulated at the different regional centres and are passed on to the extension agencies, while the new varieties are recommended for release. The agronomic schedules for the different regions and for the different strains vary considerably.

3.26. New Process actually being employed.—Of the new processes described above, the ones that are being widely employed are the newly evolved high yielding dwarf varieties viz. Jaya, Padma, Hamsa. The new strain Pankaj, Jagannath which were released for cultivation during the last year are expected to cover considerable areas during the Kharif 1970. The other strains which are reported are yet to be released for cultivation. It is anticipated, they may occupy considerable acreage during the year 1971. The plant protection and agronomic recommendations are relatively slower in being employed due to other considerations like the availability of insecticides, their cost, etc.

3.27. Machinery for dissemination.—The main machinery for dissemination is the extension agencies of the Central Government and the State Governments. Seed multiplication is being taken up in cooperation with the National Seeds Corporation. The new strains as well as the Agronomic and Plant Protection practices are demonstrated in the cultivators field by the scientists themselves under the 'National Demonstration' Scheme. The National Demonstrations are conducted under the direct supervision of research scientists in collaboration with the extension agency in order to effectively demonstrate the efficacy of the research findings. Started originally to demonstrate the highest yield potentials of individual crops under farmers field conditions, the scheme was subsequently enlarged in order to cover the whole rotation of crops. This has proved to be an effective instrument to take the results of research to the farmer.

3.28. Impact on increase in production.—The impact of the research results on production is not very noticeable. It has not been possible to obtain the full potential of the new high yielding strains due to the lack of proper water management and incidence of some serious diseases and pests like bacterial blight and gallmidge and stem borers. It is proposed to educate the rice farmers in the water management practices by imparting training to them. An Extension Training Programme has been proposed to be taken at the Central Rice Research Institute, Cuttack to train the extension men from the State Departments of Agriculture who in turn are to educate the rice cultivators in the growing of the dwarf rices. This programme is to be taken up during the Fourth Plan period. With the imparting of this training and the adoption of plant protection schedules along with the evolution of more resistant varieties, rice production is expected to register significant rise in the coming years.

3.29. In a further note the Department of Agriculture (ICAR) have stated that average yields obtained by farmers under National

Demonstration show that these yields have been gradually improving as is evident from the following data:—

Year	Average yield under National Demonstration (Q & ha)	No. of demonstrations
1965-66	41.95	123
1966-67	47.95	465
1967-68	53.34	926
1968-69	59.46	863

3.30. In another note the Department of Agriculture (ICAR) have furnished the following figures of the present level of production per hectare of rice in India and other countries:—

Country	Yield per hectare in Kilograms
Burma	1610
Indonesia	1850
Japan	5750
Pakistan	1680
Philippines	1380
India	1550

3.31. Yield is lowest India when compared to other countries excepting Philippines. With the new high yielding varieties possessing fine grains and their suitability to the different environments, the average yield is likely to register an appreciable increase in the coming years when the new strains had reached the farmers.

3.32. The total yield of rice in the country has been stated to have increased from 353.31 lakh tonnes in 1966-67 to 376.12 lakh tonnes in 197-68 and 397.61 lakh tonnes in 1968-69.

3.33. The National Training Course for rice breeders and technicians is being conducted at the Central Rice Research Institute since 1960. Nine to fourteen technicians have been trained each year under this training project. Rice breeders and technicians

working in the different States are trained under this project which is held for a period of 3 months every year. No additional staff has been sanctioned for the training programme as the scientists at the Institute themselves attend to the work. The expenditure on the training course annually approximates to Rs. 1000|-. So far 76 technicians have been trained under this training programme. In the Fourth Five Year Plan the training programme is being intensified. Provision of hostel and other facilities has been made under the scheme, towards strengthening Central Rice Research Institute, Cuttack. Under the national demonstration schemes, one district is allotted to the Institute for intensive demonstration on cultivator fields and training farmers. Jeep and necessary financial support has been made available for the purpose. Some scientists are being trained in rice cultivation techniques and research methodology at IARI, Manila. So far ten scientists have been trained; this programme is being continued.

3.34. During evidence, the Director, Indian Agricultural Research Institute stated: "We have probably 10,000 varieties of rice in this country and to replace them by one or two exotic varieties is an impossibility. Recently more than about 15 varieties have become available and they gave fairly good response to fertilisers. There is also consumer acceptance and they have a high degree of resistance to diseases and pests. That is why it is considered by many that 1970 may mark the beginning of an upsurge in rice in productivity. In the recent State Ministers' Conference also the problems were analysed. In the monsoon belt the water management is a more difficult problem. In heavy rainfall areas like Assam, Kerala and Bengal the application of nutrients and fertiliser technology are being developed. Now the basic conditions necessary for making greater achievements in rice production have become available.... Their quality preference varies from State to State. So, some sort of zonalisation of varieties according to local preferences is also necessary. That is why we are considering identification of varieties which are suited to different agro-climatic as well as consumer-preference zones... Consumer acceptance is coming although one of the problems in the regular monsoon season is still pests and diseases in rice. Wherever there is water logging the problem of water management is great. But, otherwise, purely from the cooking quality point of view many of the new varieties satisfy the demands of the people but the agronomic management practices in rice extension work is a little more difficult. Coming to water management, in the case of wheat every farmer is his own master. They will have a well and they will let in water. But, in the case of rice,

sometimes you will have to drain out water into the neighbour's field and unless the neighbour agrees you cannot flood his field. In a country like Taiwan they have water cooperatives both for letting in water and for drainage for which each village or block is made into a unit. So, extension work in the case of rice is much more complex than in the case of wheat. This is one of the difficulties we are experiencing. Unless land coordination is done and unless the whole village is taken as one drainage and irrigation unit, we would not have that high levels of management which we think we ought to have." Referring to the research work done on varieties suitable for unirrigated areas, the witness stated: "Out of 36 million hectares come purely under unirrigated rain-fed areas, which is almost one-third. There the yield can never be as great as in irrigated land. What we are trying to do is to make their yield substantially better than what they were before. For this purpose we have to think, on the one hand, of a little better soil conservation and water conservation measures and on the other on improved varieties which are capable of responding to nutrients. One variety which was developed in Coimbatore is doing well in Tamil Nadu and Uttar Pradesh. The parent of this variety is TKM-6 which is resistant to stem-borer. This variety and Taichun Native—are good for dry farms. When they were released in 1965-66 in our country the farmers of Madhya Pradesh and Rajasthan took to it because it is ideally suited to those areas."

3.35. The Committee asked whether any contact was being maintained with development in rice production in Taiwan. The witness stated: "The Government of India sent one team last year under the leadership of the Agricultural Commissioner, Dr. Cheema. They have given a report of their visit. Several Members of Parliament have also visited that country in their individual capacity. But I do not think we have got any direct official link." The witness added: They have got conditions similar to ours, very small holdings; the average farm holding is four acres and they have large farm families. So, they have developed a technology which is relevant to these requisites...how to increase the income potential of a small holding and how to increase the employment of these small holdings. They have been pioneers in the field of multiple cropping—how to get the best out of the sunlight received throughout the year. They have been very good in the field of cooperative management of agriculture. So, I personally would consider that there is much to be gained on both sides."

3.36. The Committee find that researches taken up so far have resulted in the evolution of high yielding varieties of rice suited

for different environments, but the impact of the research results on production is not very much noticeable. The total yield of rice in the country is stated to have increased from 353.31 lakh tonnes in 1966-67 to 376.12 lakh tonnes in 1967-68 and 397.62 lakh tonnes in 1968-69. The yield per hectare is the lowest in India being 1550 Kg. against 5750 Kg. in Japan. The limiting factor in increasing the yields of paddy crop has been the incidence of some serious diseases and pests like bacterial blight, gall midge, stem borers which affect the crop. The Committee hope that besides formulating chemical control measures, the research efforts will be intensified to evolve varieties with a built-in resistance to the disease and pests which afflict the crop.

3.37. Another problem requiring serious attention is improvement of water management. The Committee desire that the reserch programmes on this important problem should be strengthened. The Committee feel that the present training facilities for the farmers in growing the dwarf varieties, adoption of plant protection schedules and water management practices need to be expanded.

3.38. In view of the fact that most of the area under rice is under rain-fed conditions, the Committee emphasise that for a breakthrough in rice production in these areas, better varieties specifically suited to tolerate or escape the water shortage and suitable agronomic practices for maximising yields under these conditions should receive special attention. Further, for obtaining good yields, researches on balanced use of fertilisers including micronutrients should be intensified.

3.39. The Committee feel that efforts should be continued to evolve high yielding varieties with increased nutritional quality suitable to Indian condition.

Jute

3.40. Research programmes on Jute are being sponsored by the ICAR under three categories. First, the All India Coordinated Jute Improvement Project which started functioning from 1967. The project involved jute, mesta, ramie and sannhamp.

3.41. Eleven centres spread all over the jute growing region function under this programme. During the Fourth Plan this project is estimated to cost Rs. 53 lakhs.

3.42. Secondly, the Jute Agricultural Research Institute, Barrackpore is also taking up research on jute crop. While the coordinat-

ed project is a problem oriented project dealing with applied research, the institute takes up basic investigations which are required under the All India Coordinated Project. The programme of work of the project as well as institutes have been drawn up in such a way that it avoids duplication. Thirdly, the ICAR is sponsoring a few *ad hoc* schemes at the University, Department|State Department of Agriculture and Agricultural Universities. These *ad hoc* projects are more often complimentary to the work done at the JARI and under the coordinated project.

3.43. The expenditure incurred for jute research during the years 1967-68, 1968-69 and 1969-70 are given below:

1967-68	..	Rs. 19.66 lakhs
1968-69	..	Rs. 26.61 lakhs
1969-70	..	Rs.28.02 lakhs

(I) Number of field surveys made : Nil

New processes developed:

3.44. The new processes developed can be classified as follows:—

1. Evolving of high yielding varieties.
2. Formulation of agronomic practices, and
3. Formulation of new plant protection schedules.

Evolving of high yielding varieties :

3.45. As a result of the research work done in recent years on the improvement of jute, a number of high yielding varieties possessing desirable attributes have ben identified. One of them JRO 878, has been released for general cultivation. This is an Olitorious (Tossa) variety which possesses a special feature of resistance to pre-mature flowering. It is, therefore, quite suitable for double cropping with paddy in high and mid-land, where irrigation can be provided. The variety is tall and vigorously growing when shown early and it does not put forth side branches. Further, it possesses non-shattering pods due to which there is no loss of seeds even when the harvesting of seed is delayed by a month. Under the cultivator's conditions, the average yield of fibre of the variety is about 25q/ha. When sown in March, the variety yields beyond 30q/ha.

Besides the above, a number of other promising varieties have ben evolved which are undergoing further tests and will be considered for release shortly.

JRO 514, an Olitorius variety which has been found to do better than the standard JRO 632 in Orissa and also in Purnea and West Bengal.

JRO 7835 is an olitorious variety suitable for areas in which sowing is delayed beyond 15th April, where it is found to give better yield than the standard JRO 632. It possesses non-shattering pods.

With regard to Mesta, the following high yielding varieties have been released for general cultivation.

HC 583: It is a variety of *Hibiscus Cannabinus*, which yields about 23q|ha of fibre with 40 kg N|ha. If sown earlier i.e., in March or early April, the yield can be raised to a much higher level. It is suitable for western Orissa, Andhra Pradesh, drier regions of West Bengal and Raigarh of M.P.

H.S. 4288: It is a very high yielding variety of *Hibiscus safdariffa*. In early sowing, the yield of the fibre is around 30 q|ha with 20 kg|ha. The variety is suitable for areas of rainfall between 30" and 80".

(2) Formulation of agronomic practices

3.46. Agronomic studies are underway pertaining to time of application of fertilisers and time of sowing, harvesting rotation, etc., of jute. Results obtained indicate that even with low doses of N.P. and K. at 33:33:45 kg ha the average increase in the fibre yields of Olitorius jute was about 5.16 q|ha and of white jute about 6.25 q|ha the increase being 41 per cent and 51 per cent respectively.

3.47. In the trials conducted at JARI, Barrackpore, very high response to nitrogen has been obtained in Jute, even when it was sown after taking a crop of high yielding wheat. Application of 45 and 90 kg|ha of nitrogen, on the average, increased the fibre, yield over the control by 54—70 per cent in Olitorius jute and 76—125 pr cent in capsularis. Fibre yields with higher doses of nitrogen have been found to be more than double that of the All-India average of 12.12 q|ha. Results so far obtained indicate that the optimum requirement of Olitorius jute is about 40 kg|ha and that of Capsularis 60 kg n|ha. In red soil tract (old alluvium), the quantity of nitrogen can be increased to 60 kg and 90 kg. respectively. With regard to potassic fertilisers. It was observed that, depending on soil conditions, 20—60 Kg. K₂ O|ha was beneficial to the crop.

3.48. The work carried out on foliar application of nitrogen has indicated that soil application of fertiliser is better where quantity of nitrogen to be used is at or above 30 kg N/ha. It has been found that at the time of excess drought or flood, foliar feeding of nitrogen from urea would be useful and 10—15 kg/ha may be given in two sprays.

3.49. The studies on crop rotation have brought out clearly the advantages of following two, three or even four rotations with jute, depending upon the availability of irrigation facilities and other inputs. This not only enables the farmer to obtain very high yields of fibre and food crops from the same plot but the fertility of the soil can also be maintained by the proper use of fertilisers and manures.

Results achieved shown that in a multiple cropping programme of jute and rice, jute sowings should be completed by the end of April and the crop should be harvested by early August to facilitate timely transplanting of paddy. For early sowing in March, JRO 878 and for later sowing JRO 632 in case of *Olitorius* while JRC 212 in the case of *Capsularis* did very well. In the JARI, Barrackpore, the total annual production from jute paddy wheat crops recorded during 1968 were 132.87 q/ha in 337 days and 131.16 q/ha in 320 days.

Formulation of new plant protection schedules

3.50. Work on plant protection carried out has enabled formulation of suitable plant protection schedules which enables jute crop to remain free from insect attack and thus give increased fibre yield. Experiments conducted showed that plots receiving recommended plant protection measures (four sprays 0.04 per cent Endrin) in addition to all agricultural practices and inputs give higher fibre yield both in Tossa (48.48 q/ha) and white jute. (31.93 q/ha) than those which did not receive the protection measures (42.28 and 26.27 q/ha respectively) and the net gains due to these measures came to Rs. 300/ha and Rs. 578/ha for *olitorius* and *capsularis* respectively.

New processes actually being employed

3.51. Of the results of research obtained during the past three years the following have been actually employed in the cultivators' fields:

- (i) Variety JRO 878 which has been released for cultivation has covered significant area.

- (ii) Spray of Urea to the Jute crop.
 (iii) Multiple cropping programmes like jute, rice and jute potato.

Machinery for dissemination.

3.52. The main machinery for dissemination is the Jute Development Council of the Ministry of Food and Agriculture, who is in close contact with the extension agencies of the States Department. The new jute material and multiple cropping rotations are demonstrated by the scientists under the National Demonstration Programmes.

Impact on production

3.53. The impact of the research results on production of jute is particularly difficult to assess since the period under consideration, 1967-68, 1968-69 and 1969-70 experienced unfavourable weather conditions during the early period, particularly during 1967-68 to 1969-70 as in the case of oilseeds and cotton.

3.54. The following data about the present level of production per hectare in India and other countries have been furnished to the Committee:

Jute	Kg/ha of fibre
Brazil	1050
Pakistan	1280
India	1290

yield obtained in India is the highest.

3.55. The Committee have been informed that the total yield in the country during the years 1966-67, 1967-68 and 1968-69 was 53.58 lakh tonnes, 63.20 lakh tonnes and 35.52 lakh tonnes respectively.

3.56 It has been stated that like the other crops, yield increase in jute can be obtained by evolution of varieties with a high yielding potential. As the vegetative part of the jute crop is the final product for the industry, attempts have been made to eliminate factors which contribute to the low yields of the stems. One of the factors has been the premature flowering of the Oliterius jute. A new high yielding, Tossa (Oliterius) variety, JRO 878 with resistance to premature flowering has been released for cultivation. Besides the above, a number of other promising varieties have been evolved which are undergoing further tests and will be considered for release shortly. There are areas where the jute sowing is delayed beyond the 15th April. So far, a new variety, JRO 7845, has been evolved for such areas. This variety in addition to its higher yields

, possesses non-shattering pods which is one of the characteristics one has to look for in a good variety of jute strain.

3.57. Agronomic studies are under way pertaining to the time of application of fertilisers, time of sowing, harvest, rotation, etc. Results obtained indicate that even with low doses of NHK, the average increase in fibres was significant, the increase being between 40—50. Spraying of urea in the rainfed jute crop has appreciably increased the fibre yields of jute. Studies in crop rotation have brought out the possibility of growing 2, 3 or 4 crops in rotation with jute, depending upon the availability of irrigation facilities and other inputs.

3.58. Work on plant protection carried out has enabled the formulation of suitable plant protection schedules. Four sprays of 0.4 per cent endrin, in addition to proper agronomic practices has given net gains upto Rs. 300—Rs. 500 per hectare. These results of research when applied in field, can certainly increase production of jute.

3.59. The Committee are glad to note that the level of jute production per hectare in India is the highest (1290 kg. per hectare) as compared with other countries (Pakistan 1280kg. per hectare, and Brazil 1050 kg. per hectare). The Committee are, however, concerned to note the fall in production of jute during the year 1968-69 to 35.52 lakh tonnes from 63.20 lakh tonnes in 1967-68. The Committee have been informed that the decrease in production was due to unfavourable weather conditions experienced in 1967-68 to 1969-70. All the same, the Committee desire that the research on jute should be intensified. The Committee hope that as a result of improvement in technology, the jute production will be stepped up in the subsequent years and the requirements of the country fulfilled.

3.60. From the information furnished to them, the Committee find that new jute varieties which are better yielding than the present one, have been released for cultivation. The Committee hope that the new varieties would push up the yield per hectare of this crop. The Committee desire that efforts should continue to be made to evolve new varieties which will possess the desirable qualities like resistance to premature flowering and non-shattering of pods.

3.61. The Committee hope that agronomic studies pertaining to the time of application of fertilisers, time of sowing, harvest, rotation etc. will be intensified. In view of the fact that studies in crop rotation have brought out the possibilities of growing two, three or four crops in rotation with jute, efforts should be intensified to evolve short duration varieties of jute. Necessary steps should also be taken to improve the quality of jute.

3.62. The Committee note that work on plant protection carried out has enabled the formulation of plant protection schedules and resulted in gains upto Rs. 300 to 500 per hectare. The Committee desire that results of the research in this behalf should be suitably disseminated to the cultivators by arranging for their training so as to increase jute production.

Cotton

3.63. Research programmes on cotton were being sponsored by the ICAR under three categories. First, the All India Coordinated Research Project on cotton which commenced to function since 1967 and was originally estimated to cost Rs. 56 lakhs for four years; the project involved the study of American cotton, the Egyptian cotton and the indigenous cotton. During Fourth Plan it is proposed to include in the All India Coordinated Project a programme on agronomy and physiology of cotton, which was being operated outside the coordinated cotton project during the past three years. The expenditure during the Fourth Plan period is estimated at Rs. 122 lakhs for a period of five years. Secondly, ICAR institutes have been also on their programme work on cotton. This is particularly so with the IARI and its Regional Research Station at Coimbatore. Thirdly, the ICAR sponsored some *ad hoc* schemes at the University Department State Departments of Agriculture and Agricultural Universities. With functioning of the All India Coordinated Project, practically almost all the *ad hoc* schemes have been either terminated or amalgamated into the coordinated project. As regards the actual expenditure, an amount of Rs. 27, 34, 749 in 1967-68 and Rs. 26, 70, 926 in 1968-69 has been incurred. It has been stated that the actual expenditure for 1969-70 is not available at this stage but the expenditure is estimated at Rs. 31, 80, 387 the increase being due to termination of some *ad hoc* schemes.

Number of field surveys made

3.64. Field visits are made by the Project Coordinator of the All India Cotton Project and the Director, Cotton Technological Research Laboratory, Bombay. They are also accompanied by the Director of Regional Office of the Cotton Development Council located at Bombay. This team of three officers visit the cotton growing tracts during the main cotton season to study the performance of released varieties with regard to their yield, quality of fibre, incidence of pest and diseases etc. The association of the representative of the Cotton Development Council in these visits enables the feedback for the reorientation of research problems with particular reference to the allocation of priorities.

New processes developed.

3.65. The new processes developed in the field of cotton research during the past three years can be classified as under:

- (i) Developing new cotton strains with staple length of 1-3/16" and above.
- (ii) Evolution of high yielding varieties of hirusutum and desi cottons to replace the existing ones.
- (iii) Formulation of new plant protection schedules for the control of pest and diseases.
- (iv) Formulation of new agronomic practices.

The above four items are dealt with briefly in the succeeding paragraphs.

- (i) *Developing new cotton strains with staple length of 1-3/16" and above.*

3.66. The requirement of cotton of the Indian Cotton Textile Industry, which consumes on an average 60 lakh bales of lint annually, includes 3 lakh bales which fall under the staple length group of 1-3/16" and above. This group of cotton constitutes mainly the Egyptian type and is at present imported largely from U.A.R. and Sudan at an estimated cost of over Rs. 30 crores annually. Hence in respect of cotton with staple length of 1-3/16" and above, a major breakthrough in research was found necessary. Work under the All India Coordinated Project resulted in the ushering in of two superior strains with over 1-3/16" staple length viz. Sujata and MCU-5.

3.67. *Extra long staple varieties:* This variety was recently developed at the IARI Regional Station, Coimbatore. It has a high fibre strength with a spinning value of 100's HSC. It is the highest spinning cotton so far developed in India. In trials conducted at a number of Centres during the 1968 summer, Kharif and winter seasons, it recorded an average yield of 1930 kg. of kapas per hectare. It is resistant to black and disease in the field and also under artificial conditions when inoculated with the disease pathogen. It is also resistant to a new wilt disease now spreading in Coimbatore to which the American varieties of cotton at present grown in the area are susceptible.

3.68. *MCU-5:* Strain MCU-5 developed in Tamil Nadu has extra long staple with 1-3/16" and can give good 60's counts under mill conditions. It is suitable for the irrigated winter Cambodia tract in Tamil Nadu, where it has given about 1900 kg. seed cotton per hectare. When in full production, it is envisaged that nearly two lakh bales of superior cotton comparable to some imported styles can be produced in India from MCU-5, thereby reducing the need for

importing quality cotton. This strain has also proved to be adaptable to other areas viz. Surat in Gujarat.

(ii) *Evolution of high yielding varieties of hirusutum and desi cottons to replace the existing ones.*

3.69. Based on the further intensified work during the last three years, new varieties of cotton like PRS-72 for the rice fallows of Tanjore, AC-122 (Krishna) for the rice fallow tract of Andhra Pradesh, Hybrid-4 suited for cotton areas of Gujarat and Maharashtra, Khandwa-1 for the rainfed Nimar tract in Madhya Pradesh and MCU-6 (names as Bharathi) to replace the desi strain K-7 in the unirrigated areas of Tamil Nadu have been released.

3.70 A new promising strain (A-218) has also been identified during the current year for replacing the existing variety 320-F in the Abohar-Ganganagar tract, which had recorded on average kapas yield of 1622 kg/ha and average spinning value of 46S counts as against 31S of 320-F. This constitutes a significant advance in quality improvement of cotton grown in the northern tracts.

3.71. A significant development relating to the stepping up of yield of cotton for the rainfed tracts is the identification of a high yielding variety, Reba-B.50 at the IARI, Regional Station, Coimbatore. In view of the promising performance of this new variety under unirrigated conditions, a large number of multilocation trials have been organised during 1970 kharif and rabi seasons with this variety in Maharashtra, Madhya Pradesh, Mysore, Andhra Pradesh and Tamil Nadu.

3.72. Apart from the release of new improved strains as mentioned above, a concerted breeding programme has been initiated under the project, using early maturing cluster-boll type from the USSR to evolve a newer type of cotton plant, short in duration, with compact plant habit and bearing large bolls in open clusters, which would make it possible to achieve a major break-through in cotton yield in India.

(iii) *Formulation of new plant protection schedules for the control of pest and disease*

3.73. Plant protection schedules have been evolved for the production of the cotton crop grown both under irrigated and rainfed conditions. It has been noted from the experiment conducted under the All India Coordinated Cotton Improvement Project and the demonstration trials conducted by the textile industry in cultivators fields that plant protection measure, if taken as advised, increase the yield of the cotton crop considerably.

3.74. As regards the general schedule for protection of experimental crop at research stations, it was recommended that protection from early season sucking pests may be obtained by the soil applications of systemic granulates like phorate (Thimer 10 G at 10 kg/ha) or disulfotore salairex 5 G or disyston 5 G at 20 kg/ha. From the 45 day after sowing the crop may be protected from the pest complex by alternate sprayings with carbaryl/sulphur wettable carbaryl methylparathion or carbaryl/endsulian at 15 day intervals.

3.75. The spray schedules vary from the one cotton tract to the other. The number of schedules have already been fixed for the different cotton growing areas. The latest experience conducted have proved that 6-spray schedule proved as effective as 8-spray schedule in controlling the insect pest complex on cotton.

(iv) *Formulation of new agronomic practices*

3.76. Agronomic experiments have been conducted in the States of Punjab, Haryana, Rajasthan, Madhya Pradesh, Tamil Nadu and Mysore. On the basis of above experiment an agronomic schedule has been formulated for the cotton crop in Tamil Nadu. Such schedule for the other States are likely to be finalised during the coming year. The agronomic schedule formulated for Tamil Nadu is given below:

- (1) Sowing date of cotton in the irrigated winter and summer Cambodia tracts be advanced by a fortnight from the present practice of first week of September and first week of March in the winter and summer tracts respectively. Earlier sowing has given higher yield of seed cotton and the increase was of the order of 18 per cent to 40 per cent.
- (2) In the rainfed cotton tracts in Tamil Nadu sowing in the first fortnight of October with the receipts of early showers resulted in increase of yield of seed cotton by 10 per cent to 27 per cent in the dry-farming areas in southern districts.
- (3) As regards manurial recommendations, irrigated cotton may be fertilised with 60 kg. N/ha alone either fully at sowing or half at sowing and half before flowering.
- (4) For rainfed cotton (arboreum) full soil application of nitrogen at 30 kg. N/ha as basal dose was the best.
- (5) Inter-cropping of cotton (rainfed arboreum) and blackgram (variety k-1) in the ratio of 1:2 (area basis) was best in the matter of cash returns.

New processes actually being employed

3.77. Of the new processes described above, the ones that are being most widely employed are the newly evolved high yielding varieties of cotton. Varieties Sujata and MCU-1 have become very popular in Tamil Nadu and are being grown to a considerable extent in the State. PRS-72 and Krishna are occupying the rice fallows in the districts of Tanjore and Krishna in the State of Tamil Nadu and Andhra Pradesh. Hybrid-4 is already occupying above 10 thousand acres in Gujarat. Khandwa-1 and Bharathi which are released in 1969 and which are meant for rainfed areas of the Nimar tract in Madhya Pradesh and unirrigated areas of Tamil Nadu respectively are likely to occupy considerable areas in the coming years. Seed multiplication of the above varieties are being undertaken to saturate areas suitable for these varieties.

3.78. The plant protection schedules (the spray schedules) have become popular and are being adopted to a considerable extent by the cultivators. The development agencies of the States are making considerable efforts to increase the area under plant protection. Aerial spray have also been restored to in some of the States for the control of the cotton pest.

Machinery for dissemination

3.78. The main machinery for dissemination is the Cotton Development Council of the Ministry of Food and Agriculture which is in close contact with the various extension agencies with the State Departments. The scientists themselves are arranging to demonstrate the potential of their new high yielding strains under the central project national demonstrations.

Impact on production

3.79. The impact of the research results on production of cotton is particularly difficult to assess, since the period under consideration experienced unfavourable weather conditions during the early periods in the case of oilseeds. Further the new varieties and the plant protection schedules have recently been formulated. The spread of area under the new varieties, which would have an impact on the production of cotton in the country, will take some time for as the multiplication of seed taken considerable time. The new plant protection schedules have yet to reach all the cultivators in the different cotton growing tracts. It may be pointed out in this connection that the yield potential of the new strains have been demonstrated without doubt both in the experimental centres as

well as in the cultivators' fields. Impact on production will be certainly noticeable in a couple of years by the time it is anticipated that both the new seeds and better agronomic and plant protection schedules reach the farmers of all the cotton growing areas.

3.80. It has been stated that the research programme on cotton is oriented strongly towards increasing production. The twin objective of improving the per acre yield and simultaneously securing qualitative improvement in fibre and spinning properties has been set forth for the newly developed varieties, since the country requires both quantitative as well as qualitative self-sufficiency in cotton in respect of the various staple length and spinning quality groups. The agronomic practices and crop production schedules are developed to increase the per acre yield from the newly evolved varieties. So far, two high yielding extra-long staple cottons (Sujata and MCU-5) have been released which when grown on large scale can reduce the imports of high spinning cotton to a considerable extent. A better-spinning hirsutam (A. 218) has been identified for the northern cotton regions. Two short duration strains suited for growing in rice fellows (PRS-72 and Krishna) have also been released. A significant development relating to the stepping up of yield of cotton in rainfed areas is the identification of a high yielding variety. Riba-B-50. In view of its promising performance, a large number of multi-locational trials are being organised in rainfed cotton areas. Research findings have proved that a systematic plant protection schedule increases the yield of cotton and hence such schedules have been formulated for the different cotton growing regions.

3.81. The following figures of present level of production of cotton per hectare in India and other countries have been furnished:

<i>Country</i>	<i>yield of line per hectare in kgm.</i>
Pakistan	290
Sudan	370
USA	500
USSR	840
UAR	640
India	120

3.82. Yield is the lowest in India because 80 per cent of the cotton grown in this country is under rainfed conditions while in other countries of assured irrigation. When compared to the yields obtained under rainfed conditions in Uganda, which 73 kgm/ha, yields obtained in India are better. Further a large proportion of

the cotton area (nearly 60 per cent) is covered by the Asiatic species whose production potential is inherently lower than that of the new world species which are the predominant types grown in other leading cotton growing countries. Hence attempts have now been directed towards replacing the asiatics with the new world types.

3.83. The Committee have been informed that the total yield of cotton in the country has increased from 49.73 lakh tonnes in 1966-67 to 54.54 lakh tonnes in 1967-68 and 52.70 lakh tonnes in 1968-69.

3.84. The Committee are concerned to find that the yield of cotton in India is the lowest (120 kg/ha) as compared with other countries (USSR 840 kg/ha, UAR 640 kg/ha). There has been no appreciable increase in the production of cotton in recent years. This leads to the conclusion that research work undertaken so far has not resulted in stepping up of production of cotton in the country. The total yield of cotton in the country was 49.73 lakh tonnes in 1966-67, 54.54 lakh tonnes in 1967-68 and 52.70 lakh tonnes in 1968-69. It has been stated that the average yield in India is the lowest because 80 per cent of the cotton grown in this country is under rainfed conditions while in other countries it is grown under conditions of assured irrigation. The Committee have been informed that the research programme on cotton is strongly oriented towards increase in production. The twin object of improving the per acre yield and simultaneously securing qualitative improvement of fibre and spinning properties has been set forth for the newly developed varieties, since the country requires both quantitative as well as qualitative self-sufficiency in cotton in respect of various staple lengths and spinning cotton groups. The Committee desire that research to evolve high yielding and high spinning varieties of cotton should be intensified and a phased programme drawn up in this behalf, so that India can become self-reliant in this vital field.

3.85. In view of the fact that 80 per cent of the total cotton area is rainfed, the Committee desire that the future activities should in particular be devoted to evolving short duration and high yielding varieties. It is very essential to increase the total production of cotton grown in the country by introducing better agronomic schedules for both irrigated and rainfed conditions. Efforts should also be intensified to evolve disease resistant and insect resistant high yielding varieties.

Oilseeds

3.86. Research programmes on oilseeds are being sponsored by the ICAR under three categories. First, the All India Coordinated Research Project on Oilseeds which commenced to function since April, 1967 was originally planned to cost Rs. 1 crore for four years.

The project involved five major oilseed crop *viz.* groundnut, rape-seed and mustard, sesamum, castor and linsed. Thirty-two centres, spread all over the country, function under this programme, during the Forth Plan it is proposed to include staff-flower and the estimated cost of the project upto 1974 is Rs. 1.65 crores. The expenditure incurred are financed from the Oilseeds Cess funds. So far upto 1969-70 about Rs. 44.18 lakhs have been spent.

3.87. Secondly, ICAR institutes have also on their regular programme, work on oilseeds. This is particularly so with the IARI at headquarters in New Delhi and Regional Research Centres at Kanpur, Sirsa and Hyderabad. The expenditure incurred on oilseeds from a part of the main items of expenditure of IARI. Further institutions like the Institute for Soil Salinity or dry farming are also expected to undertake work on oilseed crops.

3.88. Thirdly, the ICAR is sponsoring *ad hoc* schemes on oilseeds at University Departments, State Departments of Agriculture. The details of expenditure incurred are available with the ICAR.

Number of field surveys made

3.89. The field surveys referred to here have been made by the staff of the All India Coordinated Research Project on Oilseeds. This is a part of the technical programme of work of the project. It consists of visits to the cultivators, field during the crop seasons, field assessment regarding stand of the crop prevalence of diseases and pests, varietal purity, collection of seed material etc. The number of such field surveys in the different regions that have been conducted so far under the Coordinated Project is as follows:—

- (1) Punjab—1 for groundnut and 1 rape seed
- (2) Haryana—1 for rape seed
- (3) Rajasthan—2 for til.
- (4) Maharashtra—1 for groundnut
- (5) Andhra Pradesh—1 for groundnut and 1 for castor
- (6) Mysore—2 for groundnut
- (7) Tamil Nadu—2 (1 for groundnut and 1 for castor)
- (8) West Bengal—1 for mustard

3.90. Due to limitations of personnel and funds the above field surveys have been in the nature of small sample surveys, in their coverage. In Rajasthan, however, more than half of the State has been covered, the remaining half not being so important for sesamum.

3.91. These surveys have yielded valuable plant material as also information towards the identification of field problems, the cultivators face. These are formulated into research problems for investigation. As an example the survey of irrigated summer groundnut crop in the TBP area of Mysore may be cited; the main limiting factor towards high yield here appeared to be that of white grub attack, over-irrigation and continuous cropping with groundnut. The first problem of grub attack has already been under investigation and remedial measures by means of chemical control with pesticides already formulated. But their application in the field by the cultivators on questioning, appears to be one of cost and availability of insecticides involved. It was, therefore, decided to intensify the research work on the biological control of white grub. This is being done in collaboration with the Oilseeds Development council and the Commonwealth Biological Control Field Station, Bangalore. This is a typical example of how a field survey provides the feed back for the reorientation of research problems with particular reference to the allocation of priorities.

New processes developed

3.92. The new processes developed in the field of Agricultural Research on Oilseeds during the past three years can be classified as follows:

- (1) Developing new high yielding varieties and hybrids of oilseed crops already under cultivation.
- (2) Developing and introducing new oilseeds crops not under general cultivation in India so far.
- (3) Formulating new plant protection schedules for the control of pests and diseases.
- (4) Formulation of new agronomic practices.

3.93. The above four items will be dealt with briefly here.

- (1) *Developing new high yielding varieties and hybrids of major oilseed crops.*

3.94. High yielding varieties and hybrids of oilseed crops were evolved during the past three years as a result of the previous research activities culminating in varieties and hybrids. This is a continuous process and with the advent of the All India Coordinated Research Project is proceeding at an accelerated pace. The fol-

lowing are the high yielding varieties and hybrids released during the last three years:

Crop	Name/ No. of the variety or hybrid	Approximate yield in kg. per ha in large scale trials.	% increase in yield over the best variety already available.
A. <i>Groundnut</i>	J-11	1287	9%
	M-145	1960	24%
	S-206	1004	10%
	Pol-1	1550	1% - 26%
B. <i>Castor</i>	NPH-1* (Aruna)	1600	58%
	CCH-3* (Hybrid)	1543	80%
	SA-1*	1772	119%
*All the above varieties and hybrids are of 150-160 days duration as against the 210-220 days of existing varieties.			
C. <i>Rapeseed & Mustard</i>	DS17M	1548	43%
D. <i>Linsced</i>	r297	783	20%
	Hira	773	18%
	Mukta	758	16%
	Neelum	679	4%

3.95. In addition to the above, there are several other types that are at present undergoing large scale testing and in view of their promising performance have been taken up for pre-release multiplication during 1970 kharif. These are groundnut kg. 61-240, C-148, NG-268 and T.C. 1 and Til 62-32.

(2) *Developing and introducing new oilseed crops*

3.96. In view of the fact that India's vegetable fat economy is predominantly based on groundnut a crop of uncertain performances, a diversification of our vegetable oil resources becomes essential. Towards this end, at the suggestion of Shri A. P. Shinde, Union Minister of State for Agriculture, Russian varieties of sunflower have been introduced and feasibility studies are under way. This work started in the rabi 1969-70 season and is being intensified during the kharif 70 season. The rabi trials involved about 8 centres in the

different States and kharif besting involves 30 centres spread out all over India. The rabi trials have yielded the following results:

Sunflower variety	No. of days for maturity	Yield in kg. per ha	
		Rainfed	Irrigated
1. Vniimk 8931	114	1458	1894
2. Peredavik	115	1515	1729
3. Armavirsky—3497	109	1614	1963
4. Armaverts	100	1245	1621
5. Sunrise	110	1130	2002

The area best suited for sunflower cultivation appears to be heavy soil areas of Maharashtra, Andhra Pradesh, Mysore and Tamil Nadu.

(3) *Formulation of new plant protection schedules for the control of pests and diseases.*

During the past three years the following practical plant protection measures have been formulated as a result of research findings.

(a) Seed dressing treatment for groundnut with Flit 406 (83 per cent) at 3 gms per kg. of Kernals, plus Thimet Granules 10 per cent at 15 kg. per hectare applied in furrows and BHC dust 10 per cent at 40 kg/ha applied to the soil. This treatment is against diseases like collar rot, wilt as well as pests like aphids, groubs and termites. This results in a net increase in the yield over control of nearly 2 quintals of pod: and an increase in the net profit by Rs. 90 per hectare.

(b) The control of the castor semi-looper *Adhoca janata* pest biologically the egg parasite *Telenomus*. The techniques for the large scale rearing of this parasite and its release in the castor field have been standardised. The Oilseeds Development Council has taken up this as a developmental activity and is sponsoring large scale release of the parasites of this important pest of castor.

(c) In the control of the groundnut seed borne disease caused by *Aspergillus niger*, it has been found that different seed treatments require different rest periods before becoming fully effective. Thus Brassicol required a 3 month period after seed treatment to be fully effective while for thiran the seed treatment should be just before sowing.

(4) *Formulation of new agronomic practices*

3.97. During the past three years the one new agronomic practice that is being recommended from research results is the nipping of side branches in castor. In a closely planted crop of Aruna, or CCH-3 or SA-1, increased yield per unit area, earlier completion of the harvest and bolder seed size has been demonstrated to be achieved by the nipping away of the side branches at the young stage. The economics of this agronomic practice has been worked out and net profit of Rs. 80-100 per hectare has been shown to be feasible. New processes actually being employed.

3.98. Of the new processes described above, the ones that are being most widely employed are the newly evolved high yielding varieties and hybrids. Seeds of groundnut J-II, Castor Aruna and GCH-3 have been most widely adopted in the field. The other varieties are spreading gradually. The plant protection and agronomic recommendations are relatively slower in being employed in the field due to other considerations like the availability of the insecticide of the cost involved etc.

Machinery for dissemination.

3.99. The main machinery for dissemination is the Oilseeds Development Council of the Ministry of Food and Agriculture which is in close contact with the various extension agencies in the State Departments. One of the areas which should be strengthened is the seed multiplying agency. The National Seeds Corporation has taken up multiplication of improved high yielding oilseeds varieties and hybrids only recently and it is hoped that soon they will be able to cater to the increasing demands.

Impact on production.

3.100. The impact of the research results on production of oilseeds is particularly difficult to assess since the period under consideration 1967-68, 1968-69 and 1969-70 experienced unfavourable weather conditions during the early period, particularly during 1967 to 1969. Consequently the oilseeds production which touched a peak of 8.45 million tonnes in 1964-65 dropped to 6.9 million tonnes in 1968-69 and is gradually catching up with that of the 1964-65. Hence it is difficult to assess the impact of these research findings on the production on an all India basis. However, increase in the production in restricted areas where the high yielding varieties have commenced to spread can be assessed for the year 1969-70 rabi and 69 kharif. This refers to the groundnut areas under Junagadh-11 in Gujarat, Maharashtra and Madhya Pradesh and Aruna Castor in Andhra Pradesh. A conservative estimate of increase in production by 10-15 per cent can be made.

3.101. It has been stated that the total yield of oilseeds during the years 1966-67, 1967-68 and 1968-69 were 64.25 lakh tonnes, 83.03 lakh tonnes and 69.26 lakhs tonnes respectively.

3.102. The Department of Agriculture (ICAR) have furnished the following data about the present level of production of groundnut per hectare in respect of India and other countries:

Groundnut:—	Kg/ha
U. S. A.	1980
Senegal	970
Japan	2190
Burma	710
India	760

The low yields is due to the major portion of the crop being grown under rainfed conditions.

3.103. The Committee are concerned to note that the oilseed production which touched a peak of 8.45 million tonnes in 1964-65 dropped to 6.9 million tonnes in 1968-69. From the figures of average yield per hectare given in respect of groundnut, the Committee find that the yield in India is the lowest (760 kg/ha) as compared with other countries (Japan 2190 kg/ha, USA 1890 kg/ha).

3.104. The Committee feel that there is an urgent need to increase the per hectare yield of oilseed crops which are mostly grown under rainfed conditions. The research effort should be intensified to build up resistance to major pests and diseases that affect these oilseed crops. In order to achieve higher yields, it is also essential that the varieties evolved need to be drought resistant or drought escaping. For this purpose suitable agronomy for cultivation of these crops in dry lands needs to be paid special attention.

3.105. The Committee have been informed that in view of the fact that India's vegetable fat economy is in the main based on groundnut, a crop of uncertain performance, diversification of our vegetable resources has become essential. With this object in view, some Russian varieties of sunflower have been introduced and feasibility studies are under way. The Committee desire that intensive studies should be made in the selection of suitable strains for the various

areas and agronomic and other schedules for successful growing of the crop should be evolved.

Dairy Science

3.106. Some of the important items of work of practical importance carried out at the National Dairy Research Institute during the past three years are described below:

Feed and fodder requirements for growth and production

3.107. Extensive studies carried out at Karnal, Bangalore and other places in India have indicated that considerable economy in the feeding of dairy animals could be effected by feeding good quality roughages. On the basis of these studies it is now recommended that when good quality leguminous fodder is available as much as five to ten kg. of milk production in addition to maintenance could be sustained without recourse to concentrates in the ration. Alternatively, 20 per cent of DCP requirement in the concentrate mixture could be replaced with good quality non-leguminous fodder.

3.108. Calves could be reared upto maturity on high roughage feeding schedule thereby saving about 50 per cent of concentrate mixture without untoward effect on growth.

Calf starters

3.109. Studies have shown that the cost of rearing calves could be reduced to less than half the cost of rearing on milk (by the conventional procedure) when calves were fed on high protein concentrate feeds of vegetable origin. During the earlier stages, it was necessary to fortify these feeds with cheap sources of animal protein (e.g. fish meal) in the form of gruel. The calf starter supplemented with antibiotics and mineral mixture would ward off the risks of scours and deficiencies during the early stages of life.

Animal Breeding

3.110. A study of the performance of the pedigreed Tharparkar herd at Karnal indicated that in a superior herd closed to outside breeding for as long a period as 30-40 years, the benefits obtained in the matter of improvement of genetic worth economic characters by use of superior sires and judicious culling of inferior stock outweighed the deterioration due to rise in intensity of inbreeding. Among the animals studied, the intensity of inbreeding varied from zero to 30 per cent with an average of 9.7.

3.111. A formula was evolved by which the transmitting capacity of a bull could be predicted from as few as six daughters with-

without losing much of the statistical precision. In this formula sire index is given as:

$$I = u + \frac{n}{n+12} (D - CA_d) - b(MC - CA_m)$$

where u is the herd average, n is the number of daughters for the sire, D is the average production of daughters, CA_d is the average production of the contemporaries of the daughters in dams, M is the average production of the dams and CA_m is the average production of the contemporaries of the dams.

Crossbreeding

3.112. Crossbreeding of Indian cattle with outstanding exotic bulls has been adopted as the policy for increasing milk production in India especially in the milk shed areas. However, information on carefully recorded data and controlled experiments are still lacking.

3.113. While there has been no agreement as to what is the most suitable exotic breed for cross-breeding in India, some of the highest figures for productive and reproductive efficiency have been recorded at Karnal when imported frozen semen from outstanding Brown Swiss sires was used for breeding Sahiwal and Red Sindhi cows. The average first lactation yield for Brown Swiss X Sahiwal F₁ animals was 3180 kg. (3 x milking, 305 days) and they required only 1.3 services per conception and calved at 30 months with a first calving interval of 13 months compared to 1.6 services and 42 months for contemporary Sahiwals. The cross-breeds were well adapted to the climate of Karnal (typical of North Indian Plains) as indicated by the physiological norms, feed and water consumption, sweating rates, etc. At Bangalore, crossbreeding of Tharparkar cows with Jersey bulls followed by F₁ intercrossing has given satisfactory results.

Conservation of fodder

3.114. One of the interesting recent developments has been the production of good quality silage from paddy straw by ensiling with berseem and also by ensiling paddy straw mixed with water hyacinth (*Eichornia crassipes*). In both cases ensiling has improved the utility of paddy straw as a feed for dairy cattle. Ensiling berseem is important because of surplus berseem produced during rabi season usually a problem. On the other hand, water hyacinth is a pernicious water weed which causes damage in many ways in paddy growing areas and this as such is not eaten by cattle.

The paddy straw berseem silage had at DCP content of 8.0 while paddy straw water hyacinth silage had a DCP content of 2.4 per cent.

Technology of milk and milk products

3.115. Research work in dairy technology has been mainly concerned with methods of chilling and transport of milk, techniques for production of concentrated|dried milk products and cheese from buffalo milk, as also, developments of techniques for better utilisation of surplus|substandard milk.

Processing and Transport of milk

3.116. Work on the production and storage quality of plain condensed milk under refrigerated conditions has opened out the possibility of transporting pre-condensed milk in refrigerated transport over long distances. Systematic studies on the comparative efficiency of different methods of cooling milk has led to the development of a milk cooler working on the principle of absorption refrigeration. Methodology has been evolved for the assessment of losses of milk solids during various stages of handling milk in fluid milk plants.

Condensed and dried milk

3.117. In view of the fact that buffalo milk is the most suitable raw material for dairy manufacture considerable attention has been paid towards the development of technology for production of condensed, dried and coagulated milk products from buffalo milk. Problems of early gelatin an discolouration in sweetened condensed full cream buffalo milk encountered by earlier workers have been satisfactorily solved. Use of tri-sodium citrate as stabiliser and pre-heating of standardised milk to temperatures higher than 115°C have been suggested as modifications to be standard technique of the production of sweetened condensed full cream buffalo milk. Importance of pre-concentration for the drying of skimmed buffalo milk to yield a skim milk powder with solubilities over 90 per cent has been stressed. Techniques for the production of dried ice-cream mixes corresponding to low, medium or high fat contents have been evolved. Such work along with the development of formulated products like coffee complete (coffee with condensed milk base) and tea complete (containing tea solids, milk, fat, non-fat milk solids and sugar) in ready to reconstitute forms will make the diversification of milk utilisation possible in milk condensories.

Quick Curing Cheese

3.118. The requirement of a prolonged curing period for cheese from buffalo milk led to the investigations for the development of quick curing varieties of cheese. One such variety developed at the National Dairy Research Institute is a quick curing Cheddar type brine-cured cheese requiring only 6—8 weeks for maturing. The procedure for the preparation of Brick Cheese using buffalo milk has also been developed at the above Institute. A process for the rapid curing of cheese under carbon dioxide atmosphere has been evolved.

3.119. Along with the work on the development of semi-hard chesses as above, attention has also been paid to the standardisation of techniques for the isolation of milk solids from skimmed milk and buttermilk. Such isolation helps in the production of soft cheese-like base suitable for subsequent conversion into sweet spiced varieties of edible products.

Other products

3.120. Conservation of surplus milk in the form of khoa in dairy plants is now possible by the use of a continuously operating milk desiccating unit designed at the National Dairy Research Institute. Techniques for the bottling of butter milk using permitted preservatives has been developed to enable storage and distribution of such bottled milk over extended periods under atmospheric conditions of handling. The feasibility of manufacturing high grade lactose in milk condensing plants using casein or cheese which has been demonstrated. Studies have also been reported on the standardisation of techniques for the production of sterilised cream from buffalo milk. Suitable techniques have also been developed to produce edible casein and soluble caseinates for skim milk which will enable elimination of import of such products.

3.121. Processes for manufacture of products like cheese spreads and powder, shrikhand powder, milk puddings, have been standardised and demonstrated. Such products are of considerable importance for defence services.

Chemical and Bacteriology Studies

3.122. Investigations in dairy chemistry and bacteriology have been mainly directed towards (i) building up basic data regarding the variations in chemical and bacteriological quality of milk for formulating standards of quality, (ii) getting an insight into the physico-chemical properties of buffalo's milk with a view to modify

the procedures for the utilisation of buffalo's milk for manufacture of milk products, and (iii) preparation of various import substitutes and other materials required by the industry.

Composition of milk and milk products

3.123. In continuation of earlier studies further work has been done to elucidate the differences in the gross composition and major and minor constituents of milk of different species, particularly cow and buffalo, and their variations due to factors like breed, age and stage of lactation. Buffalo's milk has been found to contain greater amounts of fat, protein and lactose than cow's milk apart from showing other interesting differences.

3.124. Electrophoretic studies have revealed interesting differences between cow and buffalo milk caseins in regard to their compositional make-up, electrophoretic mobility, sialic acid residue, proportion of casein fractions like k-casein, rate of rennet action, nature of the casein micells and molecular size. No genetic polymorphism was observed in k-casein fraction from buffalo's milk unlike cow's milk. Rennet action on buffalo milk casein appeared to be slower than that on cow milk casein as indicated by the release of glycopeptide from casein. Buffalo's milk was found to contain only one form of beta-lactoglobulin unlike in cow's milk. The proteose-peptone content of buffalo's milk was also lower than that of cow's milk. Similar differences have been found in regard to viscosity, surface tension, curd tension, electrical conductivity, salt balance and heat stability of milk. These differences are of considerable significance in understanding the behaviour of buffalo's milk towards processing and manufacture of products like cheeses and condensed and evaporated milks.

3.125. The chemical composition of market samples of products like ice-cream, khoya, burfi, rasgolla, shrikhand has been studied and the data have been useful in suggesting chemical standards for these milk products.

3.126. Detailed studies have been made of the nutritive value of milk and milk products. The protein efficiency ratio, digestibility coefficient and biological values for raw and boiled milk have been evaluated. In connection with the formulations of infant foods the modifications required in buffalo's milk to have it suitable for infant feeding have been worked out.

Chemical analysis and detection of adulteration

3.127. Based on the immunological differences in milk proteins of different species, the 'Hansa' test has been developed for the detection of adulteration of cow's milk with buffalo's milk. This technique has been widely applied in the field.

3.128. Adulteration of ghee with vegetable fats and animal fats is another challenging problem which has received considerable attention. Paper and thin layer chromatographic techniques have been developed for the rapid detection of adulteration of ghee with vegetable fats. An opacity method for detecting the addition of animal body fats in ghee has also been worked out. It is now possible to detect adulteration of ghee without any ambiguity.

Bacteriological quality of milk

3.129. Detailed studies of the microflora of milk produced under different conditions have revealed that lactic streptococci, coliform bacteria, spore-forming aerobes and micrococci constitute the predominant types of bacteria occurring in milk and they are generally responsible for the spoilage of milk and the products made from it. The incidence of thermotolerant and psychrophilic bacteria, which have assumed considerable importance with the increasing adoption of pasteurisation and low temperature storage of milk for market milk distribution, has also been studied.

3.130. Heat resistant and pathogenic strains of coliform bacteria and enterotoxin producing staphylococci were encountered in many samples of raw as well as pasteurised milk which is a matter of serious public health concern requiring urgent attention.

3.131. Experiments on the extraction of rennet from fistulated cow and buffalo calves without sacrificing the animals have been successful. The liquid rennet obtained in this manner gave satisfactory results in the manufacture of cheese while the calves continued to grow normally without showing any ill effects due to fistulation. Methods for distinguishing rennets from cows, buffaloes and microbial sources have been standardised. Other materials which have been prepared in the laboratory for use in the industry include butter colour from annatto and para nitrophenyl phosphate required for conducting phosphates test in pasteurised milk.

Microbiology of milk products

3.132. The microbiological quality of milk products like ice-cream, kulfi, khoa, burfi, pera, rasgolla and shrikhand sold in the

market in Bombay, Delhi, Bangalore and a few other centres has been the subject of some investigations. The number of types of bacteria occurring in these products, their sources of contamination and their role in the spoilage of the products during storage have been determined. Pathogenic strains of *E. Coli* and enterotoxigenic staphylococci were encountered in some samples of ice-cream, kulfi, and khoa indicating the need for exercising greater hygienic control over the production and sale of these products. Bacteriological standards for the quality control of the products have been suggested and these have been adopted in the ISI standard specifications.

3.133. In the course of studies on the preservation of khoa, the use of sorbate was not found to be very effective since spore-forming bacteria and micrococci were not inhibited by this chemical and, therefore, brought about the spoilage of khoa, rapidly particularly when the moisture content was high.

3.134. Incorporation of Nisin (an antibiotic produced by some strains of *S. lactis* (in processed cheese was found to inhibit the growth of anaerobic spores responsible for the spoilage of processed cheese and other canned products. It was observed that cheese tins containing Nisin at concentration of 100 units per g of cheese remained in a good conditions for over 3 months at 30°C as compared to the control samples which showed signs of spoilage in 20 days. Work is in progress to isolate more powerful strains of organisms producing anti-bacterial substances like nisin and standardise the conditions of production and use of the antibiotic preparation for preserving milk products.

Starter cultures

3.135. From detailed studies of the growth characteristics and biochemical activities of different grains of lactic acid bacteria, isolated from dahi and other fermented milk products, single strain and mixed starter cultures suitable for use in the manufacture of Dahi, Yoghurt, butter, cheese and other products have been developed. Optimum conditions for the freeze-drying of the cultures in ampoules or vials have also been standardised and the lyophilised cultures have been found to retain their viability and activity for over one year at atmospheric storage temperatures. These cultures are being distributed to the industry and the public.

3.136. Studies on the glucose and citrate metabolism of selected strains of lactic acid bacteria, using radioactive techniques, have revealed interesting information on the mechanism of production of flavour compounds.

Dahi and fermented milks

3.157. The methods of preparation of dahi, yoghurt and acidophilus milk have been standardised. Two processes—

- (i) a short set process for making dahi of yoghurt type in 5 to 6 hours, and
- (ii) a long set process for making sweet and flavoured dahi after over-night incubation for 18 hours have been developed for adoption in commercial dairy plants. A special dahi making outfit for the incubation and cooling of bottled dahi in the short set process has also been designed.

3.138. With a view to improve the shelf life of dahi and yoghurt which usually undergoes spoilage after 48 hours of storage at atmospheric temperature due to growth of yeasts and moulds, a process of incorporating carbon-dioxide in the fermented product to inhibit the growth of spoilage types has been worked out. It has been possible to keep the carbonated dahi or yoghurt in a good condition for over 20 days at atmospheric temperature.

Bacteriological tests for quality control

3.139. The application of various bacteriological tests for the examination of milk and milk products and the interpretation of the data under local conditions have been the subject of considerable research. Methylene blue reduction time was found to be much shorter, particularly in buffalo's milk, than that reported for milk samples of similar bacteriological quality in Western countries. Certain anomalies were also encountered in conducting the resazurin reduction test. Suitable modifications in techniques and interpretation of data have been suggested. A two minute accelerated resazurin test for the rapid screening and elimination of very poor quality milk supplies on the receiving platform has also been developed. These data have formed the basis for the preparation of standard methods of bacteriological analysis by the Indian Standards Institute and for formulation of bacteriological quality control programmes for adoption in market milk plants and dairies.

Preparation of dairy sanitizers

3.140. In the course of the studies on detergent and sanitizing compounds for use in the dairy industry, procedures for preparations of iodophors from raw materials available in the country have been standardised. The iodophors prepared at the Institute have been found to be comparable with preparations obtained from abroad.

Impact of new processes on increase in production

3.141. (1) Due to the work carried out on cross-breeding a number of progressive farmers have taken to rearing of cross-breed animals around Bangalore with the help of superior quality semen supplied by the Institute.

(2) A number of farmers have been introduced to promising fodder grasses and they adopted the matter as a routine.

(3) The Institute is doing A.I. work and taken prophylactic measures in 26 villages around Karnal. Similarly cattle improvement work through distribution of semen from better quality bulls is being carried in the Regional Stations as well.

(4) Commercial possibilities of transporting concentrated milk demonstrated by the Institute have subsequently been practiced with advantage by organisation like D.M.S.

(5) Recent research work on the diversification of milk for new dairy products has also attracted the attention of a number of private and public sectors who have been supplied with details of projects for commercial production.

(6) Manufacture of tea complete, coffee complete and sodium caseinate have been demonstrated to M/s. Brooke Bond (India) Ltd., M/s. Cadbury-Fry and other parties.

Number of processes actually being exploited/utilised

3.142. (1) The Baroda Milk Supply Scheme was advised on details of production and marketing of dahi of long keeping qua.

(2) Based on the results of experiments carried out at the Institute and subsequent suggestions from the National Dairy Research Institute, the Delhi Milk Scheme arranged for the long transport of pre-concentrated milk from Mehsana to Delhi.

(3) Projects for the manufacture of cheese and sterilized cream from collected milk in the Ootacamund area were furnished to M|s. Polson & Company, Bombay.

(4) Surveys were carried out at the regions of Mysore and Andhra Pradesh and Kerala regarding the status of health in the nutrition of animals in these areas.

(5) Visits were made to M|s. Keventer Dairy at New Delhi and suggestions made for the improvement of sweetened milk, butter and ghee presently purchased and marketed by this Organisation.

Machinery deployed for dissemination of the process to the users

3.143 (a) As soon as confirmed results of research are available on any particular aspect these are written up in scientific papers as research articles and also in popular non-technical language for publication in journals like 'India Dairy Man'. The results are also communicated to the Directorate of Extension in the Department of Agriculture, who bring out the publication known as 'Dairy Extension'. Besides these, the Institute itself publishes pamphlets in the research series as well as extension series which are distributed widely, particularly on the occasion of the Annual Dairy Industry Conference.

(b) Whenever any parties make any enquiries, the technical information is supplied by the Institute through information obtained from the respective divisions of the Institute.

(c) The Institute itself does not organise any exhibition except on the Annual Day each year and key village calf rallies when a demonstration and exhibition is organised for the benefit of the villages roundabout the Institute. The Institute, however, participates in exhibitions organised by the Ministry of Food and Agriculture, ICAR and State Governments, as also those organised by non-official agencies like the Farmers' Forum, Gosamvardhana Council, National Agriculture Fair, etc. The Institute staff also give radio talks at the invitation of the All India Radio. The Institute publishes articles in newspapers and other technical journals from time to time when special features on agricultural research are brought out or on the occasion of the Dairy Industry Conference in which the processes evolved by the Institute are highlighter.

(d) The technical staff of the Institute visit dairy industry factories when such visits are requested for. Teams are then appointed to examine the entire situation and render suitable advice to the organisation concerned.

(e) The Institute supplies rennet, Hansa serum (for detecting the adulteration of cow milk with diluted buffalo milk), annatto butter colour, phosphatase reagent (to detect efficiency of pasteurisation) and dahi cultures to interested parties. These products evolved by research at the Institute gain popularity through industrial use and it is hoped will stimulate manufacturers to undertake the production of these products, using the processes developed at the Institute.

3.144. The following data have been furnished about the number of problems referred to the National Research Institute:

	1967-68	1968-69	1969-70
State Government	3	1	2
Extension Directorate, Government of India	1	..	..
Directorate of Marketing Inspection, Government of India	1	..	..
Agricultural Universities . . . . .	..	1	1
Dairy Industry	6	9	7
Farmers	3	2	2
TOTAL	14	13	12

3.145. The following table shows the number of research schemes pending during the years 1967-68, 1968-69 and 1969-70:

Year	No. of fresh schemes started	No. of continuous schemes	Year of commencement.
1	2	3	4
1967-68	16	2	1954-55
		2	1955-56
		2	1956-57
		2	1957-58
		1	1958-59
		1	1959-60
		1	1960-61
		2	1961-62

I	2	3	4
			3 1962-63
			8 1963-64
			8 1964-65
			12 1965-66
			14 1966-67
			<u>58</u>
1968-69	II		2 1955-56
			2 1956-57
			1 1957-58
			1 1958-59
			1 1960-61
			1 1961-62
			2 1962-63
			4 1963-64
			3 1964-65
			10 1965-66
			12 1966-67
			15 1967-68
			<u>54</u>
1969-70	7		2 1955-56
			2 1956-57
			1 1957-58
			1 1961-62
			2 1963-64

Year	No. of fresh schemes started	No. of continuous schemes	Year of commencement.
		1	1964-65
		4	1965-66
		10	1966-67
		15	1967-68
		12	1968-69
		<u>50</u>	

3.146. The following data about the average milk yield per milch cattle in India and other countries have been furnished to the Committee:

Country	Average milk yield per milch cattle*	
	Kg. per annum (cow)	Kg. per annum (buffalo)
India	448	438
Denmark	3875	..
Australia	2300	..
U. K.	3830	..
U. S. A.	4001	..
New Zealand	2906	..
Sweden	3650	..

* Production year book FAO (1968)

3.147. The total milk production in India during the years 1966 and 1967 has been stated as 20.991 million metric tonnes and 21.103 million metric tonnes respectively. No authentic information is available with regard to the total milk production in India for the years 1968, 1969 and 1970.

3.148. The Committee have been informed that in order to increase milk production the Council had taken up research programmes on selective breeding and upgrading of different breeds of cattle under research schemes sanctioned by the Indian Council of

Agricultural Research. Having observed that the rate of progress through selection was extremely slow, in 1965 research was taken up on cross breeding of Indian cattle with exotic breeds like jersey, the work being confined to non-descript cattle in hilly and heavy rainfall areas. The ultimate object of this research programme was to determine the level of exotic blood to be introduced in the Indian breeds so as to produce an animal with optimum level of production and adapted to local environments. Under this breeding programme taken up at 11 centres in different parts of the country it was observed that introduction of exotic blood doubled the milk production.

3.149. The findings of the research conducted on cross-breeding with jersey cattle in hilly and heavy rainfall areas were reflected in the breeding policy of the country. As a result of this, cross-breeding with jersey, Friesian and other exotic breeds is in progress under the Intensive Cattle Development Projects in operation in the various States. Certain development projects in collaboration with foreign countries like Denmark, Switzerland have been taken up to introduce exotic breeds for increased milk production. Such projects are in operation in Mysore State (Indo-Danish Project) and Kerala State (Indo-Swiss Project). A large-scale breeding project has been taken up at Haringhata (West Bengal) with the collaboration of UNDP, PL-480, Government of India and West Bengal. Breeding programme with three exotic breeds is in progress under this project. The Council has also drawn up an All India Coordinated Research Project on improvement of cattle for milk production whereby it is proposed to study the combining ability of important indigenous breeds like Haryana, Gir and Ongola with three exotic breeds viz. Friesian, Jersey and Brown-Swiss. While two preliminary units of the Project are already in operation at the Indian Veterinary Research Institute, Izatnagar and Haryana Agricultural University, Hissar, three new units are likely to be sanctioned shortly at Maharashtra Agricultural University, Jawahar Lal Nehru Krishi Vishwa Vidyalaya, Jabalpur and Andhra Pradesh Agricultural University.

3.150. Buffalo presently occupies an important position as a dairy animal in the country. So far, limited research has been conducted for the improvement of this species. The Council has sanctioned an All India Coordinated Research Project for the improvement of buffaloes at three centres viz. National Dairy Research Institute, Karnal, Punjab Agricultural University, Ludhiana and University of Agricultural Sciences and Technology, Bangalore. Another

centre is proposed to be located either in the State of Gujarat or Southern Rajasthan.

3.151. Another All India Coordinated Research Project has been formulated for increasing production of goat milk. This project which is being finalised gives special stress to improvement of goat milk. This project which is being finalised gives special stress to improvement of goat as a dairy animal for the weaker section of the community.

3.152. The Committee are distressed to note that average milk yield per milch cattle in India is very low. The average yield per milch cow per annum in India is 448 kg. as against 4001 kg. in USA, 3875 kg. in Denmark, 3830 kg. in U.K., 3650 kg. in Sweden, 2906 kg. in New Zealand and 2300 kg. in Australia. The Committee have been informed that in order to increase milk production, the Council have taken up cross-breeding of Indian cattle with exotic breeds in different parts of the country. Certain development projects in collaboration with foreign countries have been taken up to introduce exotic breeds for increased milk production. The Council has also drawn up an All India Coordinated Research Project on improvement of cattle for milk production whereby it is proposed to study the combining ability of important indigenous breeds with exotic breeds. The Council have also formulated All India Coordinated Research Projects for the improvement of buffaloes and goats. The Committee desire that the research efforts to improve the cattle should be intensified with a view to increasing the milk yield.

3.153. The Committee note the research work done by the National Dairy Research Institute in regard to cattle feed, fodder, milk, milk products, chemistry, bacteriology, etc. The Committee desire that close coordination should be maintained with the industry so that these research processes are actually put to use. The coordination with the industry should also be aimed at taking up on priority basis research projects which would help resolve the problems that are facing them. The figures furnished to the Committee show that at present only a few problems are referred to the Institute by the State Governments, industry, farmers etc. During the years 1967-68, 1968-69 and 1969-70, the number of problems referred to the Institute was 14, 13 and 12 respectively. The Committee would like to know about the efforts made to establish closer coordination with the industry.

3.154. The Committee find that during the year 1969-70, the Institute took up seven fresh schemes for research while there were 50 continuing schemes already under research. Some of the schemes which were commenced more than 10 years back are still continuing. The Committee desire that the reasons for delay in completion of the old schemes should be analysed and necessary action taken to complete them.

CHAPTER IV

PUBLICATIONS

The stock of unsold publications with the Council (excluding publications worth Rs. 3 lakhs taken over from the defunct Commodify Committees) was as follows:

Year	Value of publications at the beginning of the year.	Value of publications brought out during the year.	Value of publications sold during the year (including complimentary copies)	Value of stock of publications at the end of the year.
(In lakhs of Rs.)				
1964-65	10.06	3.99	3.29	10.76
1965-66	10.76	3.57	3.97	10.36
1966-67	10.36	5.11	3.36	12.11
(Para 3 of Audit Report on the accounts for 1966-67)				

4.2. The Committee desired to know the reasons for holding stock of publications to the tune of nearly three times the yearly sales. In a written reply, the Department of Agriculture have stated: Printing and sale of publications is a continuing process. Broadly speaking, the publications issued by the Council can be categorised as (i) scientific monographs and highly technical books or (ii) books of semi-technical or general nature. The scientific publications under category (i) take 4-6 years or even more to sell while the semi-technical and general books are sold out within a period of 2-3 years. A list of some of the scientific monographs issued by the Council is given below:

Sl. No.	Title	Year of printing	Print order	Copies sold	Stock in hand
1	2	3	4	5	6
1	Zygnomaceao	1959	3000	1600	1400
2	Cyanophyta	1959	3000	1900	1100

1	2	3	4	5	9
3	Role of Blue Green Algae	1961	2000	1700	300
4	Vaucheriaceae . . .	1962	2000	1100	900
5	Charophyta . . .	1962	2000	800	1200
6	Clavariaceae of India . . .	1962	2000	700	1300
7	Indian Cercosporae . . .	1964	2000	500	1500
8	Ulotrichales . . .	1965	2000	600	1400
9	Phaeophyceae . . .	1967	1000	350	650
10	Mucorales of India . . .	1968	1000	150	850

These are specialised publications with limited demand and have to be published to provide information to research workers. These books are written by Indian authors. In case these are not published, the country will have to depend on foreign material. Even though these publications do not have a very wide market, it is essential to have them published irrespective of the sale potential. These standard publications are useful for a number of years. In order to keep the price of such publications at a reasonable level to promote its sale, the print number is not allowed to fall below a certain minimum.

4.3. Semi-technical and general publications are sold out in two to three years. In most of the cases, the copies were sold out within a period of 2-3 years. The Council had to reprint some of these titles to meet the public demand.

4.4. Of the total stock value as on 31-3-1970 of Rs. 15.74 lakhs, publications worth Rs. 7.60 lakhs fall under the category of monographs. The value of publications of semi-technical nature is Rs. 8.14 lakhs.

4.5. In view of the slow selling nature of scientific monographs and additions of fresh stocks, the total stock value of the publications is likely to be more than the value of annual turnover by 2-3 times. Efforts are, however, being made to reduce the stock by (i) intensive sales promotion measures, such as issue of special circulars, publicity folders, catalogues, press reviews, press advertisements, sale and display at exhibitions/conferences and (ii) increasing the ratio of titles of general nature.

4.6. During evidence, the representative of the Council stated: "We also consider reducing the prices of books which do not find a ready market in one or two years after their publication in consultation with the Committee which advises the ICAR on publications."

4.7. The Committee asked whether in the light of the experience gained, the Council has examined and laid down any general principles to be adopted for assessing printing requirements in future. In their written reply, the Department of Agriculture have stated: "The print order for the Council's publications is decided on the basis of (1) estimated demand for each title and (2) sale performance of similar titles in the past.

4.8. Print order of journals is fixed on the basis of actual number of paid subscribers as on date, requirements of free and exchange distribution, authors and advertisers' complimentary copies. Additional provision of 100 to 200 copies is also made to meet the demand from the new and casual customers. In case of Special Numbers, the print order is increased depending upon the likely extra demand. The number of unsold copies of journals for the period April, 1969-September, 1969 is as follows:

Journal	No. of unsold copies	Print order per issue
1. Indian Farming (Monthly)	8 (for 6 issues)	14.500
2. Kheti (Monthly)	66 (for 6 issues)	7.500
3. Indian Journal of Agril. Sciences (Monthly)	407 (for 6 issues)	1.300
4. Indian Journal of Animal Sciences (Bimonthly)	143 (for 3 issues)	750
5. Indian Horticulture (Quarterly)	385 (for 2 issues)	3.500

4.9. These copies are required to meet the demand from various agencies for back issues. Thus it may be seen from the statement that the print order is fixed on a realistic basis, and that we are generally left with not many unsold copies.

4.10. Print order of scientific monographs, technical books and bulletins are assessed on the basis of estimated requirements of agri-universities/colleges, research institutions, research scholars, university, libraries, State and Central Governments agencies and probable demand from foreign countries. As the aggregate demand from these sources is generally not much for these specialised titles, the print order is generally not above 10,000 copies.

Any print order below this figure increases the cost of production per copy.

4.11. For general books like 'Poultry, Keeping in India' and books like 'Handbook of Agriculture', the print order is fixed by taking into account the demand from the general public, students, etc., besides demands from sources referred to above. Their print order is fixed between 2,000 to 10,000 copies keeping in view the demand for and price of each title as also the sales performance at similar titles in the past.

4.12. For semi-technical books having lesser sale prospect, the print order is decided in a similar manner keeping in view the demand from the various sources as indicated above. Their print order generally varies from 1,000 to 5,000 copies.

4.13. The Committee desired to know the position of disposal of about Rs. 3 lakhs worth of publications taken over from the defunct Commodity Committees. The Department in a note stated that publications worth Rs. 3.29 lakhs were taken over from the Commodity Committees. Out of these, publications worth Rs. 1.19 lakhs have been sold out. The value of unsold stock as on 31-3-1970 is Rs. 2.10 lakhs. Concerted and continuing efforts are being made to sell the remaining stock.

4.14. The Committee desired to know whether any steps had been taken to weed out obsolete publications. In their written reply, the Department of Agriculture have stated that "the Council framed rules in 1965 for weeding out its publications with the approval of the Governing Body. The weeding out of obsolete publications is done accordingly. Before publications are weeded out, their prices are reduced and further sales promotion measures taken to dispose of as many copies of a title as possible.

4.15. During the past five years, the Council has thrice weeded out back issues of journals which were for weeding out as per rules. So far no books have been weeded out because they did not become due for weeding according to rules."

Journals

4.16. The Committee are not satisfied over heavy accumulation of unsold publications of the Indian Council of Agricultural Research particularly scientific monographs which have a limited demand. A large number of copies of the publications published as early as 1959 are still lying in stock. The Committee have been informed that as on 31st March, 1970, the total value of the unsold publications increased to Rs. 15.74 lakhs of which the scientific monographs ac-

counted for 7.60 lakhs and semi-technical publications Rs. 8.14 lakhs. The Committee desire that in the light of the experience of Council regarding the sale/issue of the publications, the print order of both scientific monographs and semi-technical publications should be carefully fixed. In their opinion the print order of scientific monographs should be kept to the minimum.

4.17. The Committee desire that vigorous steps should be taken to reduce the stock of old publications by adopting various sales promotion measures and by distribution of copies to libraries, Agricultural Universities, Research Institutes etc.

Journals

4.18. The Committee pointed out that the proforma accounts of Council's journals for 1968-69, indicated that there was a net deficit of Rs. 10,456 without taking into account the cost of establishment and that some journals were sold much below cost price. The Committee desired to know the proportionate cost of establishment relating to journals for the years 1966-67 to 1968-69 and the reasons for selling journals below the cost price. In a written reply, the Department of Agriculture, stated: "The Council's publications programme includes journals, books, monographs, bulletins, reports and other forms of literature. No officer or staff is exclusively meant for looking after the journals. As such it is not possible to work out the establishment charges relating to the publication of journals alone".

4.19 The Council publishes five journals, Indian Farming, Kheti, Indian Horticulture, Indian Journal of Agricultural Sciences and Indian Journal of Animal Sciences. The figures relating to their cost of production after taking the advertisement revenue into account and their sale price during 1969-70 are given below:

	Cost per copy after taking the advertisements revenue into account.	Sale price per copy
	R. P.	Rs. p.
1. Indian Farming (Monthly)	0.47	0.85
2. Kheti (Monthly)	0.39	0.60
3. Indian Horticulture (Quarterly)	1.36	1.00
4. Indian Journal of Agricultural Sciences (Monthly)	3.11	2.25 & 4.00 w.e.f. 1-1-70.
5. Indian Journal of Animal Sciences (Bimonthly)	4.95	2.25 & 4.00 w.e.f. 1-1-70

4.20. The journals at Sl. 1, 2 and 4 listed above are not sold now below their cost of production. The sale price of Indian Farming has been raised from 85 paise to Re. 1.00 per copy w.e.f. 1-4-70. The profit and loss is worked out for the journals as a whole and not separately for each journal. Indian Horticulture is primarily meant to provide information to orchardists, vegetable growers and amateur gardeners and any major increase in its price would have serious repercussions on its sale. However, price of the journal was reviewed and it has been increased from Re. 1.00 to Rs. 1.25 per copy w.e.f. April, 1970.

4.21. Simultaneously, the following measures have been taken to reduce the cost of production and to make the Indian Horticulture as self-supporting as possible:

- (i) The number of pages in the journal has been reduced from 40 to 32; the colour plates have been dispensed with excepting in special issues; and Indian art paper is being used for the cover instead of foreign art.
- (ii) Among other steps being undertaken are reorientation of the contents to make it acceptable to a wider clientele to improve its sale; sales promotion measures to popularise the journal; increasing the advertisement revenue in the journal to meet the deficit.

4.22. Indian Journal of Agricultural Sciences and Indian Journal of Animal Sciences are highly technical periodicals meant to disseminate scientific information among research workers in the country. Their demand is limited and because of low print orders, their cost of production is higher than that of the popular journals. Any increase in their sale price affects circulation adversely and the scientists will be deprived of the valuable information contained in them.

4.23. Their prices have recently been reviewed. As a result, the sale price of Indian Journal of Agricultural Sciences has been increased from Rs. 2.50 to Rs. 4.00 per copy and that of Indian Journal of Animal Sciences from Rs. 2.25 to Rs. 4.00 per copy with effect from 1st January, 1970. The Indian Journal of Agricultural Science after revision of the sale price is thus not sold below cost as can be seen from the statement above. While revising the sale price of the above journals, it was explained to the Governing Body that publication of scientific journals need not always be planned with a view to be self financing as their main value lay in

keeping the scientist informed of the latest researches. The scientific information disseminated in this way, therefore, should not be measured in terms of profit and loss. Accepting this position the S.F.C. and G.B. agreed to the revising of the price of our scientific journals as above.

4.24. Efforts are, however, being made to increase earnings from advertisement and circulation to reduce deficit on these journals taken together. It may also be mentioned that most of the scientific journals produced in the country are subsidised by research bodies/learned societies.

4.25. The Committee asked reasons why the cost of production of the publications was high. The representative of the Council stated that the books were of a technical nature and needed very careful editing. The main reason for high cost was that the print order was small and that sometimes there were coloured blocks, a number of illustrated pictures and diagrams. The Committee pointed out that most of the publications including the Annual Reports were printed on art paper and asked whether it was not possible to print a few copies meant to be sent to foreign countries, embassies etc. on art paper and the remaining on ordinary paper. The Director General of the Council replied: "We will get our Publications Committee to examine it."

4.26. The Committee find that two of the five Journals published by the Indian Council of Agricultural Research are still being sold below the cost price. The Committee desire that steps should be taken to make all the Journals self-supporting by reducing the cost of production or increasing the sale price.

4.27. The Committee are of the view that one of the factors contributing to the cost of production of publications of the Indian Council of Agricultural Research is the use of art paper. The Committee suggest that the publications and annual reports may be printed on ordinary paper. A few copies required to be sent to foreign countries, embassies etc. may, however, continue to be printed on art paper.

4.28. The Committee desired to know whether steps were taken to publish the books in regional languages so that these could be understood by the cultivators. The representative of the Indian Council of Agricultural Research stated that normally the first category of books (scientific and technical) were brought out in

English as they were on important research. But a large number of the other category of books (Semi-technical and popular books) were being published in Hindi. They had selected four or five more popular books to be published in the regional languages.

4.29. The Director General, ICAR, stated that: "we do not deal directly with the farmers or students. The education department and agriculture department of the State Governments deal with them and we feel that the information contained in our books and journals should be utilised. The results published have to be adapted to the particular regions. Of course, we also publish two popular journals and a number of bulletins which are sent to the State Departments of agriculture, agricultural universities and are also available on sale. We also have some staff for translating some of these books into regional languages. Work has started on some but none has been completed so far."

4.30. The Committee asked whether State Governments were translating any books published by the Council. The Director General replied: "If any one wants to translate a book published by ICAR he must take our permission." The representative of the Council added that the State Governments were quite interested in having the book if it was translated but they were not interested in translating them. Explaining the background of undertaking translation of books in the regional languages by the Council, the witness stated: "The origin of translation in regional languages is that the Regional Assistant Editors were appointed to feed the news in regional language with regard to research. They did not have full-time work. So they were given the duty of this translation. Except one editor in each regional language there is no additional staff for this purpose." The witness added that they had so far started work on about 5 books in each regional language. One book 'Agricultural handbook' had been translated in most of the regional languages but it has not yet been printed. The Committee asked whether after translation, the books were published by the Council or the manuscripts were sent to the States. The witness replied: "We bring them here. But for future we are exploring whether after the manuscripts are approved by the ICAR, the bringing can be handed over to an approved publisher or to the State Government."

4.31. The Committee consider that there is need for publishing books of semi technical and general nature in regional languages also so that they may be of use to the farmers. They note that in the whole country for this purpose the Indian Council of Agriculture

ral Research are at present utilising the services of the Regional Assistant Editors who have been appointed to feed the news in regional languages. The Committee would suggest that the question of bringing out publications in regional languages may be taken up by the Council with State Governments.

Staff employed in the Publications Wing

4.32. The Committee desired to know the number of publications brought out year-wise for the last four years. The Department of Agriculture furnished the following statement:

	1966-67	1967-68	1968-69	1969-70
1. Journals	5	5	5	5
2. Books	5	12	7	8
3. Technical Bulletins	7	16	10	8
4. Reports	11	8	11	5
5. Farm Bulletins	10	8	Since transferred to Date of Extension.	
6. Brochures . . . . .	..	..	5	17
TOTAL	38	49	38	43

From another statement furnished to them, the Committee find that the number of posts of technical and supporting staff in Publications Wing was 130 during the year 1969-70.

The following table shows the expenditure on the technical officers and staff and the supporting ministerial staff in the Publications Wing:

Expenditure on Technical Officers and Staff of Publication Wing Unit-wise

Unit	1967-68	1968-69	1969-70
	Rs.	Rs.	Rs.
1. Director . . . . .	..	..	18,900.00
2. Editorial			
(a) English	1,71,026.40	1,64,200.68	1,63,660.20
(b) Hindi and other Indian languages	1,45,752.00	1,70,894.40	1,61,239.80
3. Production	26,618.40	40,711.80	44,502.00
4. Art and Photo	1,03,672.44	1,10,355.00	1,17,077.00
5. Business, Publicity and Public Relations	96,031.80	1,14,396.00	1,16,453.40
TOTAL	5,43,101.04	6,00,557.88	6,21,332.40

Expenditure on Supporting Ministerial Staff for the Publications Wing Unit-wise.

Unit	1967-68	1968-69	1969-70
	Rs.	Rs.	Rs.
1. <i>Editorial Units</i>			
(a) English	91,673·16	86,040·06	89,552·64
(b) Hindi and Other languages . . . . .	..	..	..
2. Production . . . . .	..	10,266·04	8,313·60
3. Business, Publicity and Public Relations	90,743·16	89,723·80	1,11,535·08
TOTAL	1,82,416·32	1,86,029·90	2,09,401·32

4.33. The Committee asked whether a number of senior posts in the Publications Wing were necessary. The Director General replied: "For the type of publications that we bring out... I think it is necessary because we have publications for research people and post-graduate students and if our publications are to find a place in the universities and research institutions, these are necessary..... some foreign books are re-printed at cheaper prices. So, according to the present standards they appear to be necessary, but we constantly review the position. Sir, we have re-organised in 1966. We have a system of reviewing our activities."

4.34. The Committee desired to know whether any review had been made of the work done by the staff in order to effect economy in expenditure in staff. In a written reply, the Department of Agriculture had stated: "The publications programme in English for the year 1970-71 was reviewed at the Senior Officers meeting of the ICAR presided over by the Director General. The manuscript pages of the above programme roughly work out to 15,000 manuscript pages (10,000 pages—books etc. and 5,000 pages—journals). The other approved titles include 2 books, 9 bulletins and 6 reports which are to be published as early as possible. In addition to the above, reports, proceedings of conferences, symposia, workshops, seminars etc. which are of high priority are added from time to time. Keeping this publication programme in view, the staff is considered essential."

4.35. In their written reply, the Department of Agriculture have given the volume of work with units of Publications Wing as follows.

“Editorial Unit (English).

4.36. The editing work on manuscripts ranges from marginal to the most exhaustive at times involving re-writing of certain portions. The work involves editing the text, consultation of books to check references, re-arrangement of data, re-writing legends and captions, selection of illustrations, preparation of index and bibliographies. In addition to the above, first galley proofs, first page proofs and second page proofs have to be scrutinised and compared with the original manuscript in respect of each publication.

4.37. The responsibilities of handling the above items of work on 50 publications and 4 journals is borne by one Chief Editor, three editors assisted by 6 assistant editors apart from the lower staff. At any point of time, each officer works on the manuscript taken up for processing as well as on a number of publications under production in various stages. The workload is heavy and would more than compare with that of the corresponding officers in CSIR or the Publication Division of the Information and Broadcasting Ministry.

4.38. An Editor/Assistant Editor can handle about 1,200 pages of manuscript according to normal standards obtaining in India. The existing editorial staff can handle a maximum of 10,800 manuscript pages as against a total of 15,000 pages on the programme. It is, therefore, obvious that the Council is not over-staffed on editorial side and no economy could be effected here.

Editorial Unit (Hindi and other Indian Regional Languages.)

4.39. Apart from the items of work listed in para 4.34, the editorial staff on the Hindi has also to translate books originally written in English. This is a very heavy responsibility.

4.40. The above items of work on 11 books and other publications and one journal included in 1970-71 programme are being handled by one Editor and two Assistant Editors besides junior staff.

4.41. Under the Agriculture Information Service designed to disseminate scientific information on a country-wide scale features and special articles are, issued to a large number of news-papers and journals in Hindi, Assamese, Bengali, Gujarati, Kanada, Oriya,

Marathi, Tamil and Telegu. On an average, four features are issued in each language every month. For this work there is only one assistant editor in each language. In addition to above there are seven major books in the programme for 1970-71 for translation and publication in the regional languages. There is no scope for economy here too.

Production Unit

4.42. Some of the major items of work handled in Production Unit are: To inspect presses and approve them for the Council's work; to prescribe specifications and the format of publications; to invite and finalise quotations, renewal of existing contracts; to prepare production estimates; to fix sale price; to examine manuscripts from the production angle; to examine illustrations for block-making; correspond with the presses; to check the bills; to prepare printing schemes; and to supervise all the printing jobs on-the-spot to arrange for the purchase of paper, its storage and distribution to the presses.

4.43. For handling of above items of work, there is one Chief Production Officer, one Assistant Production Officer, one Press Liaison Officer and two Technical Assistants apart from other lower staff. The total publication programme of the Council for 1970-71 consists of 50 publications in English, 11 in Hindi and 6 in regional languages in addition to five journals. The work of this unit is cumbersome requiring contacts with different firms which have to keep up the schedules during labour-unrest and material-scarcity conditions. Therefore, the staff mentioned above is considered essential.

Art and Photo Unit

4.44. The main items of work handled in the Art Section are to prepare original designs, to draw illustrations, maps, histograms, charts to select photographs, to size mark them for block making, to check their reproduction etc. The above items of work are handled for 50 publications in English, 11 publications in Hindi and 5 journals. For this there is one Chief Artist supported by 8 artists. This section has to do a great amount of creative work requiring time.

4.45. The photo unit in this section consists of a Senior Photo Officer and a photographer apart from dark room assistants. For illustrating council's publications and helping the Publicity Unit, the photographer has to take photographs and colour pictures.

Business, Publicity and Public Relations

4.46. Business Unit of the Council look after sale and distribution of publications; procuring advertisement for the Council's periodicals; sales promotion work of the publications; participation in exhibitions; main accounts of sales and advertisements; enrol subscribers

to periodicals; maintain proper stock account of publications; despatch of publications; release of advertisement relating to publications; arranging review of publications; undertake tours for sales and advertisement.

4.47. For undertaking the above items of work, one Business Manager, one Assistant Business Manager, one Sales Promotion Officer, one Stores Officer and other supporting staff at lower levels are employed.

4.48. The Council has at present publications worth about Rs. 15 lakhs in stock. It sold publications worth about Rs. 6.18 lakhs during 1969-70. The advertisement during the period was about Rs. 1.44 lakhs. In order to increase the revenue from sales and advertisement and to attend to the other items of work mentioned above, the present staff is considered to be absolutely essential and no reduction in staff is possible.

Publicity and Public Relations Unit

4.49. The Publicity and Public Relations Unit of the Council consists of one CP and PRO, one AP, PRO and one Senior Publicity Assistant. Agricultural publicity is a specialised job requiring full time attention. After the Council started handling its own publicity work, the Press, Radio, TV, etc., began to take note of the activities of the council and it received wider coverage.'

4.50. From the information furnished to them, the Committee find that the number of books, journals etc. published by the Indian Council of Agricultural Research during the years 1966-67 to 1969-70 was 38,49,38 and 43 respectively. The expenditure on staff employed on publications wing increased from Rs. 7.26 lakhs in 1967-68 to Rs. 7.87 lakhs in 1968-69 and Rs. 8.31 lakhs in 1969-70. The posts of technical and supporting ministerial staff during 1969-70 numbered 130 including a number of senior posts. Considering that the number of books, journals, etc. brought out by the Council during the last four years ranged from 38 to 49, the Committee feel that staff employed for the purpose is not fully justified. Elsewhere in this report, the Committee have already recommended that the staff of the Council as a whole should be reviewed by an independent body.

CHAPTER V

MISCELLANEOUS

Delay in utilisation of building and equipment—Cotton Technological Research Laboratory, Matunga.

Audit Paragraph

For expansion, modernisation and accommodating the testing section of the Cotton Technological Research Laboratory, Matunga, a building costing Rs. 3.76 lakhs was constructed in March, 1964. The building and also spinning machinery worth Rs. 4.60 lakhs (foreign exchange expenditure of Rs. 3.43 lakhs) purchased in June-December, 1964 have not been put to use (March, 1969) due to delay in installation of air-condition plant in the building.

5.2. For providing humidity and temperature control plant in the building for maintaining standard atmospheric condition, an offer from a firm for supply of a plant for Rs. 67,500 (foreign exchange expenditure Rs. 13,500 was received in December, 1962). The offer was not accepted by the Council till September, 1967 when only foreign exchange for Rs. 4,860 was released. Meanwhile, the firm increased the price to Rs. 2.61 lakhs, which was ultimately accepted. The delay in providing foreign exchange entailed extra expenditure of Rs. 1.94 lakhs (approximately). The Council stated (August, 1969) that the Government of India could not release foreign exchange to the extent asked for because of tight foreign exchange position and the probable availability of some parts of the plant in India.

(Para 5 of Audit Report on the accounts for the year 1967-68).

5.3 During evidence, the representative of the Indian Council of Agricultural Research stated that in this case there was a programme to modernise the laboratory which before its transfer to the ICAR in 1966 was under the Indian Cotton Committee. That Committee had appointed an expert Committee to go into the question of modernisation of the laboratory. There were four units in the building for ginning, blowing, spinning and testing of the fibres. These four units in the building had to be partially modernised, particularly in the blowing room of the apparatus had to be modernised and replaced by a new one. Partly the spinning unit also was removed and the fibre testing unit had to be removed to a new laboratory. The programme included construction of a building and modernisation of the machinery in that particular building. After the ground floor of the

new building was built, the ginning machine was shifted from old building to the new one, as soon as the first floor was in a position. Some of the testing machinery or instruments which could be transferred were transferred. From the very beginning efforts were made to procure the machinery or humidity and temperature in new building because it was essential without which the control and testing instruments could not be fitted.

5.4. In a written note, the Department of Agriculture, stated: "The necessity of providing the Humidity and Temperature Control Plant in the new building was foreseen by the laboratory even at the time the proposal for the new building and for the new imported machinery was mooted. The Special Sub-Committee which finalised in May, 1957, the list of equipment necessary for modernisation of the laboratory realised the need for maintaining constant atmospheric conditions of 27°C temp. and 65 per cent relative humidity in the Spinning and Testing Sections. Accordingly, the Sub-Committee had recommended the import of a Conditioning Plant manufactured by Messers 'A', USA at an estimated cost of Rs. 1,80,000. However, in view of the difficulty of the foreign exchange position of the country, it was decided in 1961-62 to explore the possibility of obtaining the conditioning plant locally with a view to minimise the requirement of foreign exchange. Accordingly, quotations were invited for the Humidity and Temperature Control Plant in December, 1962 from fifteen local firms. Representatives of various firms visited the laboratory to inspect the site and to have an idea of the extent of work involved. The lowest quotation for one plant was submitted by Messers 'B' for Rs. 67,500, in early 1963, involving a foreign exchange component of Rs. 13,500 on condition that the I.C.C.C. will arrange for the release of foreign exchange to this extent. This quotation did not include the cost of installation and other ancillary works such as provision of false ceiling, plumbing, ducting, electrical wiring, etc. The Government of India in the Department of Agriculture approved the proposals of the ICCC regarding the release of foreign exchange of Rs. 3.43 lakhs for the spinning machinery and Rs. 13,500 for the necessary parts of the control plant. However, the D.G.T.D. who cleared the requirement for the machinery would not clear the requirement of Rs. 13,500 for the required parts of the control plant. Before he could clear from the indigenous angle he wanted the laboratory to contact Messers 'C' whether they could supply the required parts. This was in July, 1963. After making enquiries with Messrs 'C' the laboratory informed the Government of India in October, 1963 that the firm was not in a position to supply the particular essential parts required for the carrier model. The Government of India wanted to know whether the work could not be entrusted to any other firm who might be ready to complete it with

indigenously available material. The laboratory stated after consulting the ATIRA that the only Indian firm capable of giving constructive advice on the installation of the plant was Messers 'B'. As suggested by the D.G.T.D., the Government of India again directed the I.C.C.C. to approach Messers 'D' Bombay, Messers 'E', Calcutta and Messers 'F', Bombay. Complete quotation was received only from 'G' who also wanted foreign exchange to be provided. After weighing all the pros and cons and also considering the stature and capability of the various firms in India, the I.C.C.C. requested for approval of the Government of India for entrusting the work of air-conditioning the testing laboratory to Messers 'B' at a cost of Rs. 1,35,000 (excluding the charges for ancillary items). This was in June, 1965. It would appear from the alternative suggestions made by the D.G.T.D. while withholding clearance from the indigenous angle to the import of component parts, essential for maintaining the temperature and humidity levels, constantly within a rigid narrow range, for which the foreign exchange was asked for, that the D.G.T.D. did not properly appreciate the requirements of the laboratory. Air-conditioning equipment for general purposes such as offices, theatres, hospitals etc., was locally available. In these cases, the temperature inside the room is kept lower than that outside, mainly for providing comfort for the occupants. On the other hand, the requirement of the laboratory was a plant to maintain the temperature and humidity as constant levels of 27°C and 65 percent relative humidity. Hence, the indigenous plants were not suitable for the laboratory as these did not have necessary arrangements to control the temperature and humidity. This point was repeatedly stressed in the letters from the laboratory to the Government and to the D.G.T.D. and was also personally explained to the D.G.T.D. Authorities by the then Director of the Laboratory in July, 1964. It was also pointed out repeatedly that these special controls were not being manufactured in India.

5.5. During the intervening years, Messers 'B' had established their own factory near Bombay for manufacture of air-conditioning equipments. Hence, in November, 1965, the firm informed us that the requirement of foreign exchange was reduced from Rs. 13,500 to Rs. 3,600 as only six components were required to be imported. However, the price of the plant had been increased to Rs. 1,62,000 due to various factors such as increase in cost of raw material, labour charges and excise duty. Even this price did not include ancillary work such as false ceiling, plumbing etc. This was in December, 1965. Even at this stage, the D.G.T.D. insisted on exploring the local market for the six components. For example, the laboratory was asked to contract Messers 'H' and Messers 'F'. The I.C.A.R. could not process

the case further due to the Government ban on utilisation of foreign exchange during 1965-66, following the national emergency. In the meanwhile, the requirement of foreign exchange for the six components was revised to Rs. 4,860 in August, 1966 consequent on the devaluation of the rupee. No Indian firm was in a position to supply these components and only in September, 1967, the I.C.A.R. was able to get release of foreign exchange and the contract with Messers 'B' was finalised for Rs. 2,61,000 included Rs. 36,000 for Standby Compressor and Rs. 63,000 towards the cost of ancillary works. Though the Government had released foreign exchange for Rs. 4,860 to import the six control parts required, the Chief Controller of Imports and Exports issued a licence for Rs. 3,200 only in October, 1968 to cover only three of the six items. After protracted correspondence with the C.C.I. & E. at a high level from the I.C.A.R., the licence for another Rs 1,200 to cover the import of two more parts was received by the end of September, 1969 Messers 'B' agreed to procure the sixth item from their own quota. This installation of the plant was completed and the plant was commissioned to service on manual controls on the 25th September, 1969, and the yarn testing section was at last shifted to the first floor of the new building in September, 1969.

5.6. Messers 'B' have now imported the control parts required and fitted them on the Humidity Temperature Control Plant during July, 1970.

5.7. It would be apparent from the above that the delay was mainly due to the fact that the Government wanted every indigenous source to be explored before releasing foreign exchange and partly due to the national emergency following the Chinese and Pakistan aggression. In view of the peculiar circumstances, it will not be possible (or desirable) to fix the responsibility for the delay on any individual."

5.8. The Committee are surprised that in this case while the Directorate General, Technical Development cleared the foreign exchange of Rs. 3.43 lakhs for purchase of the spinning machinery, they appear to have dealt with in a routine manner the request of the laboratory for sanctioning foreign exchange amounting to only Rs. 13,500 required for certain components in the Air-Conditioning Plant without which the spinning machinery could not be installed. Even after the efforts made to explore the possibility of getting the air-conditioning plant from the indigenous sources had failed, the DGTD did not clear the foreign exchange component of Rs. 13,500. Although after establishment of their factory in India

The manufacturer reduced in November, 1965 the foreign exchange requirement from Rs. 13,500 to Rs. 3,600 (later revised to Rs. 4,860 consequent on the devaluation of the rupee), the total cost of the air-conditioning equipment was increased from Rs. 67,500 quoted in 1963 to Rs. 1,62,000 in 1965 due to increase in cost of raw materials, labour charges and excise duty. Ultimately, a contract was finalised with the firm in September, 1967 for Rs. 2,61,000 which included Rs. 36,000 for a stand-by compressor and Rs. 63,000 towards the cost of ancillary works. The Committee are unhappy that delay in clearance of foreign exchange component of Rs. 13,500 in 1963 resulted in extra cost of the air-conditioning equipment to the tune of Rs. 94,500. Besides extra cost paid for the procurement of the air-conditioning plant, the installation of the costly machinery valued at Rs. 4.60 lakhs (foreign exchange expenditure Rs. 3.43 lakhs) in the new building was delayed. The Committee feel that responsibility should be fixed for the delay at various stages in this case. The Committee desire that necessary steps should be taken by the Director General, Technical Development to prevent recurrence of such cases.

Audit Paragraph
Outstanding Utilisation Certificates

5.9. (i) For grants given by the Council (excluding Commodity Committees) upto 31st March, 1967, utilisation certificates for Rs. 230.35 lakhs (detailed below) are still awaited (February, 1969).

(a) State Governments	Rs. 106.84 lakhs
(b) Central Universities/Institutions	Rs. 110.02 lakhs
(c) Private and non-Government bodies	Rs. 13.49 lakhs

(ii) Out of grants given by the defunct Commodity Committees upto 31st March, 1966, utilisation certificates for Rs. 140 lakhs were outstanding on that date. Of that, utilisation certificates for Rs. 31.81 lakhs (detailed below) were awaited (February, 1969):

(a) State Governments	Rs. 28.21 lakhs
(b) Semi-Government institutions	Rs. 3.31 lakhs
(c) Universities	Rs. 0.29 lakhs

(Para No. 2 of Audit Report on the accounts of the Indian Council of Agricultural Research for 1966-67 and 1967-68).

5.10. The Committee desired to be furnished with a statement showing the latest position of the outstanding utilisation certificates for grants paid upto the end of March, 1969. In a written reply the Department of Agriculture (Indian Council of Agricultural Research) have stated that "an amount of Rs. 691.46 lakhs is outstanding at present for want of audit and utilisation certificates in respect

of grants paid upto 31-3-69 (excluding those paid by defunct Commodity Committees). This amount consists of:—

Year (s)	Total grants paid	Amount for which utilisation certificates are outstanding .
	(In lakhs of Rs.)	
Up to 31-3-1964	654.70	45.27
1964-65	54.58	20.53
1965-66	50.88	21.45
1966-67	237.84	70.04
1967-68	289.71	186.02
1968-69	402.25	348.15
Up to 31-3-1969	1,699.56	691.46

5.11. The total outstanding amount of Rs. 691.46 lakhs is inclusive of Rs. 348.15 lakhs paid during 1968-69 for which utilisation certificates are due to be received upto 31.3.71 and Rs. 186.02 lakhs paid during 1967-68 in respect of which utilisation certificates were due by 31.3.1970.

5.12. Regarding the schemes sponsored by the erstwhile Commodity Committees upto the date of their abolition, utilisation certificates for Rs. 140.00 lakhs were outstanding as on 31-3-1966. This has since been reduced to Rs. 24.61 lakhs."

5.13. During evidence the Committee desired to know the reasons for delay in furnishing utilisation certificates for the grants given by the Council. The representative of the Council stated that they were giving grants to a number of bodies for *ad hoc* schemes and centres of coordinated research projects and also for agricultural universities, under the plan. The amount of grant had been increasing from year to year; it had increased from Rs. 54.58 lakhs in 1964-65 to Rs. 237.84 lakhs in 1966-67, Rs. 289.71 lakhs in 1967-68 and Rs. 402.25 lakhs in 1968-69. During the past 2-3 years there had been some improvement in that the Council had been collecting Audit Utilisation Certificates of much larger magnitude than before 1966. The witness added that there had been some old cases which had to be pursued with the Accountants General. One of the reasons for delay in getting audited certificates was the reorganisation of the States and the formation of agricultural universities with the resultant change in the auditing authority. The witness added that

the Council were regularly receiving the annual progress reports which indicated that the amounts had been utilised. But their register continued to show the grants as outstanding for want of audit utilisation certificates, which were required to be submitted according to the schedule of terms and conditions.

5.14. The Committee were informed that the Advisory Board and Governing Body finally approved a comprehensive revised schedule of terms and conditions for giving grants in October, 1969. According to the revised terms and conditions, further payments in respect of a scheme would be stopped unless an audit utilisation certificate was furnished by the grantee within a period of 2 years after the end of the financial year during which the grant had been made. The representative of the Council assured that with the revision of the schedule, the grantees would be made to send the utilisation certificates very quickly. Besides the progress reports which were required to be sent within a stipulated period would indicate whether the work was progressing satisfactorily on the lines approved by the Council, otherwise the grants could be withheld.

5.15. The Committee were informed in a written reply that according to the revised terms and conditions, further grants were stopped in 16 cases where the grantees had failed to furnish the audit certificates within the prescribed time. The total amount of grants involved in these cases was Rs. 22.44 lakhs. During evidence the representative of the Council stated that after the grants were stopped in these cases, the Council received utilisation certificates in five cases. He quoted the case of U.P. Agricultural University where the auditor and the Examiner of Local Fund Accounts had refused to give an audit certificate separately for individual schemes for which the Council had given the grants and wanted to give an overall certificate. The discussion continued for three years. But after the procedure for refusing release of money was tried, the Vice-Chancellor was able to make them agree to give the requisite certificate under protest.

5.16. The Committee asked about the procedure followed for releasing the next instalment of the grant. The representative of the ICAR stated that the grantees were required to furnish a demand for the money supported by a statement of expenditure for the earlier years as also the audited utilisation certificates showing the opening balance from the last instalment and the future requirements. The grants were given every six months. Each time the demand based on the actual expenditure for the previous six months and the projection for next six months.

5.17. The Committee suggested that it was proper for the Council to discuss any procedural difficulties in the issue of the old utilisation certificates with the Comptroller and Auditor General of India so that if audit were satisfied that the funds had been properly utilised, the arrears could be cleared. The representative of the Council agreed to this.

5.18. The Committee drew attention to the recommendation of the Estimates Committee, para 17 of their 55th Report (Second Lok Sabha) that the Administrative Ministries should obtain annually a performance on achievement report from the grantees in respect of each grant and review its utilisation with assistance of some leading non-officials interested in the objects of the scheme so as to regulate the payment. The Committee desired to know whether the Council had obtained performance or achievement reports from grantees in respect of each grant and reviewed its utilisation so as to regulate the payments of grants in aid in future. In a written reply, the Council have stated:

“In accordance with the schedule of terms and conditions governing the grants-in-aid from the Council the Institutions operating the ICAR schemes are required to submit to the Council a fiscal and a technical report in September and March each year in the prescribed proforma. In the case of all India Coordinated Projects, the report is to be sent to the project coordinators in August and February with a copy to the Council so as to enable the coordinators to send the consolidated report to the Council by September, March of each year. These reports in so far as they pertain to schemes financed out of Cess Funds of the Council are examined by the technical officers in the ICAR and are also placed before the appropriate scientific panels, appointed by the Director General, ICAR. The scientific panels consist of Specialists (both officials and non-officials). They scrutinise these reports on the basis of their expert knowledge of the subject/disciplines. The progress reports for the All India Coordination Projects which are financed from the Plan Funds allocated by the Government of India are discussed and examined in the workshops which are attended not only by the scientific workers of the particular scheme, but also by eminent scientists from the various disciplines, specially invited for the purpose.

Detailed instructions have also been issued that the progress report in respect of the schemes sanctioned by the Coun-

cil should be received from all the schemes authorities by the prescribed dates. It has also been prescribed that the following para may be included in each letter of sanction issued to the grantee institution:

"The remittance of funds for the scheme|project would be withheld by the Council in the event of the Annual Progress Report of the scheme not being received by the Council by the date prescribed by it for the purpose and also in case it is found to be unsatisfactory.' (vide circulars No. 38-7|68-Cdn (I) dated 24-12-1968 and 1-3-1969.

The procedure laid down is being followed in the ICAR."

5.19. The Committee are not satisfied over a large amount of Rs. 691.46 lakhs outstanding for want of utilisation certificates in respect of grants paid by the Indian Council of Agricultural Research upto 31st March, 1969. The Committee are particularly concerned about the pendency of the old utilisation certificates. The amount outstanding in respect of the grants issued upto 1966-67 is Rs. 157.29 lakhs which includes Rs. 45.27 lakhs paid upto 31st March, 1964. Besides an amount of Rs. 24.61 lakhs was outstanding in respect of grants given by the erstwhile Commodity Committees. The Committee desire that any procedural difficulty in the issue of utilisation certificates in the old cases should be discussed with Audit with a view to clear the arrears. The Committee would like to know the concrete measures taken in this behalf and the progress achieved.

The Committee note that according to the Council's revised schedule of terms and conditions, further payments of grants should be stopped unless audit utilisation certificates were furnished by grantees within a period of two years. The Committee hope that the revised procedure will be strictly followed in future in order to avoid accumulation of utilisation certificates.

Delay in adjustment of advance

Audit Paragraph

5.20. Of Rs. 44.64 lakhs advanced to the Chief Controller of Printing and Stationery, Central Public Works Department, officials of the Council and other parties during 1958-59 to 1966-67, Rs. 4.03 lakhs (including Rs. 2.59 lakhs for the period upto March, 1965) were pending adjustment (June, 1969).

(Para 3 of Audit Report on the accounts for 1967-68).

5.21. The Committee desired to know the latest position of the recoveries. In a written note, the Department of Agriculture, have stated:

“The amounts were advanced to the C.P.W.D., Chief Controller of Printing and Stationery, Pay and Accounts Officer (Department of Supply) and Customs Department of the Central Government. Advances were also given to the officials for departmental expenditure. The adjustment accounts are normally to be rendered by the Department of the Central Government officials when the services are rendered, supplies are made or the work for which the amounts were advanced is completed. For the day-to-day working of the Council, the advances are made as and when the need arises and, therefore, it is a continuous process. As a result thereof the adjustment of those advances is also a continuous process. Some delay occurs in the receipt of adjustment accounts from the various Departments of the Central Government. The Council regularly issues reminders to get the accounts and as a result of the repeated reminders the bulk of amount has been adjusted leaving a balance of only Rs. 2.22 lakhs against the total advance of Rs. 44.64 lakhs which works out to less than 5 per cent of the amount advanced.”

5.22. The Committee desired to know whether adequate steps had been taken to safeguard the recoveries. In their written reply, the Department of Agriculture have stated:

“Mostly advance payments were made to the various departments of the Central Government and the element of risk is not involved. As regards advance to the officials for the departmental expenditure, it was paid to the official authorised by the competent authority under a clear acknowledgement. While making such authorisation, the competent authority is required to take into consideration the status of the employee and therefore the element of risk is not involved in these cases also. As a measure of safeguard, there is also a system of bringing to the notice of competent authority the cases of delays of adjustment in the advances. Adequate steps are always taken for prompt recovery adjustment and the system is working satisfactorily.”

5.23. The Committee find that out of Rs. 44.64 lakhs advanced to the various parties during the years 1958-59 to 1966-67 a sum of Rs. 2.22 lakhs is still pending adjustment. The Committee desire that efforts should continue to be made to adjust the outstanding amount. Necessary steps should also be taken to ensure that the advances are adjusted promptly in future.

**Non-submission of *pro forma* accounts.
Audit Paragraph**

5.24. Non-submission of *pro forma* accounts in respect of Biological Products Division of the Indian Veterinary Research Institute, Izatnagar, which the Council is required to submit in pursuance of Ministry of Food, Agriculture, Community Development and Cooperation (Department of Agriculture)—Indian Council of Agricultural Research—note for the Public Accounts Committee on SI. No. 196 of Appendix LIII (Para 5.101) their 41st Report (Third Lok Sabha), have not been submitted so far (August, 1969).

(Para 6 of Audit Report on the accounts for the year 1967-68).

5.25. The Committee desired to know when this Division was established and when the Division was asked to prepare the *pro forma* accounts. In a written reply, the Department of Agriculture, have stated that the Imperial Bacteriological Laboratory was originally established at Poona in the year 1889. It was shifted to Mukteswar (U.P.) in the year 1893. By 1901, six different biologics, some of them prepared from local hills bull had been evolved and issues were started. A site (Kurgaina) near Bareilly was also acquired to test the products under plain conditions. Later on it was found that sera could be produced more economically from cattle in the plains. A substantial portion of the manufacture was, therefore, shifted to Kurgaina. This site was sold in the year 1923 and extensive site was acquired at Izatnagar where a sub-station of the laboratory was established. In 1930 the name of the sub-station was changed to Imperial Veterinary Serum Institute. In 1936, it was renamed as Biological Products Section of the Imperial Veterinary Research Institute and in 1948 the section was redesignated as Biological Products Division, Indian Veterinary Research Institute, Izatnagar.

5.26. The Government of India, Education, Health and Lands Department accorded sanction to the introduction of a scheme of costing with effect from 1st August, 1930. The method of cost accounting suggested in 1930's were modified as and when found necessary. Last revision was made in 1960's in consultation with the Ministry of Finance (Cost Accounts Branch) and with the concurrence of the Comptroller and Auditor General of India and the revised Cost Accounting Manual was introduced with effect from 1st April, 1965. The *pro forma* accounts are being prepared in the revised form from the year 1965-66.

5.27. The *pro forma* accounts for the year 1968-69 has been prepared and audited by Accountant General, Uttar Pradesh *vide* his

letter No. CAW/III/PF-Bio-Pro/68-69/445 dated 23-7-1970. The Biological Products Division is mainly engaged in the manufacture and supply of veterinary medicines and also in conducting research for improvement of these products. It is at present manufacturing different kinds of sera and vaccines numbering 33. These can broadly be classified into four groups as follows:—

- (1) Serum
- (2) Bacterial Vaccine
- (3) Viral Vaccine
- (4) Diagnostic Antigens.

5.28. The Department of Agriculture have furnished a statement showing the cost of production per unit of the various biological products manufactured during the years 1966-67, 1967-68 and 1968-69. It has been stated that the cost of production of certain items was higher than that of the previous year due to increase in the price of raw materials used for manufacture of biological products and increase in direct and indirect charges including overheads.

5.29. The profit and loss during three years ending 1968-69 are indicated below:

	1966-67	1967-68	1968-69
	Rs.	Rs.	Rs.
Sale	5,37,896	8,23,887	8,32,747
Gross profit/loss + (—)	[37,134	(—)27,032	40,270
Net profit/loss	(—)1,99,994	(—)2,81,445	(—)2,59,375
Percentage of gross profit/loss on turn (%) (—) over	6.9%	(—)3.28%	4.8%

The State Governments, Union Territories, Defence Department are the principal buyers of the products. The policy of the Government of India has been to sell the products in the country on 'no profit no loss' basis. The selling rates fixed for inland sales are also made applicable to the sales in foreign countries.

5.30. In pursuance of the recommendations of the Public Accounts Committee in their Twenty-Third Report (Third Lok Sabha), the prices are reviewed and revised by the Government of India, Ministry of Food and Agriculture (Department of Agriculture) *vide* their

letter No. 15-1/64-L dated 10-9-1964 subject to review and revision after the introduction of the revised cost Accounting Manual for this Division, which was then under consideration. The revised Cost Accounting Manual was introduced with effect from 1st April, 1965. As decided by the Government of India earlier, the prices were again revised based on the cost of manufacture as per the accounts for the year 1965-66 and were brought into effect from 1st June, 1967. Since the gross profit of the year 1968-69 is not sufficient to meet the selling and administrative expenses and net loss is on the high side, a proposal is under consideration to revise the selling price based on the *pro forma* accounts of 1967-68.

5.31. The Committee are concerned to note that the *pro forma* accounts of the Biological Products Division of the Indian Veterinary Research Institute, Izatnagar disclosed a net loss amounting to Rs. 2.00 lakhs in 1966-67, Rs. 2.81 lakhs in 1967-68 and Rs. 2.59 Lakhs in 1968-69. The Committee desire that necessary action should be taken to increase the selling price of the products based on the *pro forma* accounts of 1967-68. The Committee suggest that the institute should lay down a procedure for periodical review of the selling prices of the products so as to ensure that no losses are suffered on the sale. The Committee also suggest that the administrative expenditure of the institute should be kept under check.

Assets of terminated/completed schemes.

Audit Paragraph

5.32. (i) Out of 390 schemes terminated upto 1967-68, the value of assets of 262 schemes left with the grantees is yet (December, 1969) to be assessed and recovered from State Governments/grantee institutions.

(ii) Similarly, the value of assets of 224 schemes out of 280 completed upto 1967-68 sponsored by the defunct Commodity Committees is yet (December, 1969) to be assessed and recovered from State Governments/grantee-institutions.

(Para 2 of Audit Report on the accounts of ICAR for 1968-69)

5.33. During evidence the representative of the Council stated that the number of schemes the assets of which were to be assessed and recovered had since been reduced from 262 to 224. The witness added that actually there was slight confusion about the word 'assets'. Under the pattern of aid the Council paid 50 per cent of the total amount required for normal schemes to the State Governments. While the State Governments were supposed to have their own buildings and other important equipment, the money given by

the Council was mostly meant for meeting expenses on salary and allowances of the staff employed and there was some provision for contingencies. The contingent expenditure related to the purchase of small articles such as test tubes, test tube holders, lights etc. According to the terms of the scheme, all the leftover articles purchased out of the money given by the Council would be the property of the Council. There was no such provision in the other schemes of the Government of India. But under the schemes of the Council the grantees were required to prepare a list of these articles and send it to the Director General of Agriculture who forwarded it to the Council after verification. As some of the schemes were operating in very remote places, there was some delay in the assessment of the left-over articles. The witness added that these articles could be utilised by the grantees for other schemes and book adjustments made. The witness added that the Council had since made some changes in the procedure so that the grantees had to report to the Council the details of the articles purchased and consumed during the year. The grantees were required to maintain a proper stock register of these articles which should be shown to the auditors. After the end of the financial year an inventory of the equipment purchased was required to be sent to the Council in the prescribed form.

5.34. When the Committee asked about the accounting of important equipment, the witness replied: "There is no problem on account of any special equipment because if there is any special equipment it is specially mentioned in the sanction and the sanction order spells out so much money is sanctioned for such and such purpose". He added: "There should be specific sanction for the purchase of important items of furniture or equipment given by the standing Finance Committee which was appointed only after the scientific panel gives its approval. Otherwise utilisation certificates would not be given by the auditors. In a written reply, the Department have stated:

"Clause 4 of the Schedule of Terms and Conditions currently governing the grants-in-aid from the Council reads as follows:

"The equipment and apparatus, if any, purchased out of the grant given by the Council from time to time shall remain the property of the Council and proper stock accounts should be maintained therefor. An inventory of equipment purchased out of the grant paid by the Council should be sent to the Council immediately after

the close of the financial year concerned in the prescribed *pro forma*.

"The Stock Registers maintained for the purpose should be shown to the auditors for applying the necessary check with reference to the grant paid by the Council.

Equipments such as air-conditioners, refrigerators, exhaust fans, furniture, steel almirahs, type-writers, etc., should not be purchased out of Council's grant unless specifically sanctioned by the Council as an item of expenditure.

The grantee may take over at the end of the scheme:—

- (a) Consumable stores at their cost price; and
- (b) equipments at their depreciated cost. The value of consumable stores and equipments arrived at on the above basis should be communicated to the Council within a month after the termination of the Scheme."

5.35. According to this clause it will be seen that specific sanction of the Council is required in the form of details under the sanctioned schemes for the purchase of certain special equipments which are costly in nature. It was in this context that during the evidence it was stated that normally there should be no problem on account of settlement of the value and recovery thereof in respect of special equipment purchased out of the grant given by the Council and specially detailed in the sanctioned scheme. During the evidence the essential difference between special and costly equipments *vis-a-vis* the sundry articles purchased out of the provision for contingencies was sought to be pin-pointed.

5.36. The Committee would like the Indian Council of Agricultural Research to examine whether it is desirable to have the present degree of meticulous accounting in the case of small left-overs like test tube holders etc. after the schemes are completed. The Committee are of the view that the question of the recovery of their cost should be limited to important items. This would avoid delay in assessment and recovery of the assets left with the grantee. The Committee would like to know the outcome of the examination.

Outstanding Recoveries

Audii Paragraph

5.37. Recovery of Rs. 16.36 lakhs was outstanding on 31st March, 1969 from various parties for publications, products, etc. sold on

credit by the Council and its institutes. The corresponding figure on 31st July, 1969 was Rs. 12.17 lakhs.

[Para 3 of Audit Report on the accounts of Indian Council of Agricultural Research for the year 1968-69]

5.38. During evidence the representative of the ICAR stated that the amount outstanding related to both the headquarters and 14 other institutes. The amount had been reduced to Rs. 9.82 lakhs at the end of June, 1970 out of which the major portion of Rs. 6.36 lakhs related to the Indian Veterinary Research Institute, Izatnagar for sale of vaccines and sera to State Governments. Most of the outstandings pertained to the various State Governments and other agencies. Prior to the transfer of control of the Institute to the ICAR the State Governments used to indent these things and the payments were made through the Accountants General by book adjustments. After the ICAR took it over the State Governments were asked to send demand drafts in payments as the council had no accounts with the Accountants General and the State Treasuries. During the transitional period there was some difficulty in payment and this resulted in some accumulation. In many cases, the State Governments had made arrangements for book adjustments but the Council could not realise the money. The witness added: "There was now a very effective mechanism of recovering these amounts." The outstandings also include dues on account of sale of publications on credit to State Governments Departments, reputed booksellers and some foreign parties and advertisements from State Government agencies and National Seeds Corporation appearing in the ICAR journals. These amounts were being recovered.

5.39. The Committee note that the outstanding amount for recovery from various parties for publications, products sold on credit by the Council and its institutions has been reduced from Rs. 16.36 lakhs as on 31st March, 1969 to Rs. 9.82 lakhs as on 30th June, 1970. The Committee urge that vigorous efforts should be made to recover the outstanding amount and that the dues should not be allowed to accumulate in future.

Equipment lying idle

Audit Paragraph

5.40. The following equipments acquired by the institutes under

the Council have been lying unutilised/uninstalled so far (February, 1970):

Sl. No.	Equipment	Name of the Institute	Cost	Year of purchase	Remarks
1	Freeze Drying Apparatus	National Dairy Research Institute, Karnal	Rs. 10,000	March 1964	The equipment was received with certain parts damaged and is lying idle ever since. Necessary claims preferred against insurance company has not materialised so far. te
2	Stroke Freeze Drying Unit with stoppering device vacuum gauge	Indian Veterinary Research Institute, Mukteswar	33,955	July 1956	This equipment was received by the Indian Veterinary Research Institute under the TCA operational Agreement. The Compressor of the equipment was received in a damaged condition. The equipment was temporarily put into working order by using indigenously made compressor but it again went out of order. The equipment is lying idle for want of the compressor import of which was sanctioned by the Council in June 1967.
3	Two 48 K. W. generating sets	Indian Veterinary Research Institute Mukteswar	116,340	July 1967	The generating sets are yet to be installed.

[Part 4 of Audit Report on the Accounts for 1968-69]

Freeze Drying Apparatus

5.41. Ouring evidence the representatives of the council stated that it was considered desirable to utilise the offer of the UNICEF to provide foreign exchange under the scheme known as "Rupee re-imbursable Fund" for the purchase of the Freeze Drying Apparatus in this case. Under the scheme the UNICEF used to provide a certain amount of foreign exchange against an equivalent amount of rupees to be credited to their own in India. Under this arrangement, the UNICEF was a negotiating agency and they placed an order for this equipment with a firm in Switzerland who had also agents in India. At the time of purchase the equipment was the patented machine for research on Dairy products and therefore it

was recommended to the UNICEF who invited tenders and finalised negotiations for purchase. When the consignment arrived in India, it was found damaged from outside. Since the consignment was insured, it was brought to the notice of the Insurance Company who made an inspection. The witness added that they had no idea about the extent of damage inside the package itself. Serious attempts were made not only by the National Dairy Research Institute but by UNICEF and the agents of the Company in India to ask the insurance company to make an assessment of the damage and prepare an estimate so that the amount could be recovered. After a lot of effort the agents of the company in India sent an appraisal and a detailed list of equipment damaged was made which amounted to about 900 Swiss francs (About Rs. 900 at that time.) The representative of the Company did not come to accept the damage and refund the amount. The witness further stated that in view of the fact that the equipment was a patented product they could not temper or just make some local purchase to put it in order. The matter had, therefore, to be kept under correspondence with UNICEF on one hand and the Swiss firm and its agents on the other. The witness admitted "It is unfortunate that quite a lot of time elapsed and the equipment could not be actually put to use." Asked whether the insurance claim has been finalised, the witness replied "They have not finalised the claim". We have decided to take upon ourselves to set the equipment in order. The witness added that during the last four or five years considerable advance had been made in the country and it was possible to get some spare parts and put the instrument in working order because "it is a matter of a thousand rupees and it is a matter of delay of several years." Asked whether the equipment was not inspected, the witness replied "we are not aware of it because the UNICEF would have arranged the inspection, we are not involved at all except as recipients."

5.42. The Committee deprecate the delay of about seven years in utilising the Freeze Drying Apparatus purchased in 1964 for Rs. 10,000 for want of certain parts costing about Rs. 900. The Committee hope that early action will be taken to put the equipment in order. The Committee desire that responsibility should be fixed for delay in putting the equipment in order.

Stroke Freeze Drying Units

5.43. During evidence the Director of the Institute stated that the equipment was received in a damaged condition from the United States. Efforts were made by the TCM Experts to get the damaged parts, but they did not succeed. Later on efforts were made by the Institute to get the equipment repaired through the Indian Supply

Mission, Washington. But due to ban on the Import of parts on account of the Pakistan crisis, the import was stopped. Later efforts were made and the equipment was released in 1967. But this time the Director General, Technical Development advised that as the country had since advanced industrially, an imported compressor was not required. The witness added that the latest position was that they had received an indigenous compressor and the machine had been put in order. There was only one part in the machine which would have to be imported under the actual user's licence. The Committee asked how requirements of the Institute were met during the intervening period. The witness replied that they had another bigger freeze equipment and the work was not held up. Asked when the freeze equipment in the present case was commissioned the witness replied that it was done one month back.

5.44. The Committee feel that there has been unconscionable delay of more than 14 years in replacing the compressor of Stroke Freeze Drying Unit purchased in July 1956 as a cost of Rs. 33,955. The Committee suggest that responsibility should be fixed for the delay. The Committee desire that the compressor should now be procured expeditiously and the equipment commissioned. The Committee would like to know the progress made in this regard.

Generating Sets—

5.45. The Committee wanted to know the position regarding installation of generating sets. The Director of the Institute replied that the set had been already installed and commissioned and it was in a working condition. Asked about the reasons for delay in installation, the witness stated that the set had to be set up at an altitude of 7,500 ft. and the equipment was obtained from the Central Public Works Department. The Central Public Works Department engineers and the engineers of the firm had been making efforts to set the equipment in order.

5.46. The Committee regret to observe that this is another case where the installation and commissioning of costly equipment purchased in July 1967 for Rs. 1,16,340 was delayed. The Committee desire that responsibility should be fixed for the delay.

Audit Paragraph

Central Sheep and Wool Research Institute, Malpura

5.47. For imparting training to the staff of the Central Sheep and Wool Research Institute, Malpura a weaving and finishing expert of an international organisation joined that institute in June, 1968. But by then the building to house the weaving and finishing machinery was not ready nor had the machinery and equipment required for the purpose been procured. The international organi-

sation was to provide equipment, machinery and services of technical experts while Government of India was to provide the building. Some of the weaving machinery was received in October, 1968 and February, 1969 and construction of the weaving shed was taken up only in September, 1968. The original period of assignment of the specialist expired in October, 1969 and his term had therefore to be extended for another six months upto 15th April, 1970.

[Para 5 of Audit Report on the Accounts for 1968-69]

5.48. During evidence the representative of the Council stated that foreign expert was required to assist in the inspection and installation of the machinery ordered by the F.O. under the UN Development Programme for the special fund. The expert had also to train the staff required for the scheme. Another item of work given to the expert was to advise about eight states for the sheep development programme. The order for the weaving and spinning machines was placed by FAO before the arrival of the expert. The expert arrived in June 1968, while the first consignment actually arrived in October 1968 and the second installment in February, 1969. The witness added that to the extent possible certain amount of synchronisation was done in this case. But there was "some delay in this." He added that "there was not inordinate delay". While the building was sanctioned in 1968, the contractors were not forthcoming to do the work at that distant place where there was difficulty of construction. The building was completed in 1969, while the machinery arrived in February, 1969 and commissioned by July, 1969. Thereafter the staff was trained for 3-4 months by the expert in running the machinery.

5.49. The Committee desired to know the work done by the expert during the period June 1968 and July 1969. In a written note, the Department of Agriculture has stated:

"The expert arrived in Malpura in June 1968. After arrival he started helping the institute in initial planning of the departments of Weaving and Finishing; working out their lay outs, details of electric fittings and plan for installation of machinery etc. He also held discussions with his technical counterpart at the Institute and imparted technical know-how to the staff of the Fibre Processing section. Besides this he visited Indian Woollen Mills to study the availability of weaving and finishing equipments and production conditions available within the country. at the Institute he helped in installation and commissioning of equipment which had already arrived for securing

and carbonising of wool, spinning and carding and manufacture of Semi-worsted materials, their processing and spinning.

The weaving machines were received by the Institute in October, 1968 and February 1969. This machinery was installed by the expert in a portion of the spinning shed as the construction of the shed for installation of this machinery had not been completed. After erection and commissioning of the weaving machinery the expert imparted practical training in weaving to the staff of the Institute. He has also been helping in organising fibre-processing section of the Institute for organising the research programme and its implementation.

The foreign expert arrived before the actual arrival of the machinery for weaving because his presence was necessary at the time of arrival of the machinery so as to check breakage, damage etc. at the time of unpacking, prepare claim for insurance and replacement of broken or damaged parts etc."

5.50. The Committee regret to point out that there was lack of planning in this case, as a result of which the foreign expert arrived in India several months in advance of the construction of building and the arrival of the plant and machinery that he was required to instal therein. The Committee feel that had proper liaison been maintained with the supplier about the supply of the plant and machinery, the time of delivery could have been known. In case delay was anticipated in the delivery of the plant and machinery, the arrival of the expert in India could have been deferred and the extension of his assignment for a further period of six months and extra expenditure avoided.

NEW DELHI;
July 8, 1971.
Asadha 17, 1893 (Saka).

ERA SEZHIYAN,
Chairman,
Public Accounts Committee.

APPENDIX

No.	Para No.	Ministry/Dept. Concerned	Conclusions/Recommendations
1	2	3	4
1	1.17	Ministry of Agriculture (I.C.A.R.)	<p>The Committee note that after examining the recommendations made by several teams of experts, the Government of India decided in March, 1965 to reorganise the Indian Council of Agricultural Research. The basic intention behind the decision was to make the Council a trully functional, a technically competent and fully autonomous organisation for promoting, guiding, coordinating and directing agricultural research and animal husbandry research and education throughout the country. Accordingly, during the period 1st October, 1965 to 1st April, 1969, the Council took over the functions of 9 Central Commodity Committees, 15 research institutes and 8 soil conservation centres, which were previously financed by the Central Government grants. Although, the Council has been reorganised from 1st April, 1966 and has taken over the administrative control of the various organisations, the process of consolidation has not yet been completed. The evaluation of the assets and liabilities of three research institutes (Indian Agricultural Research Institute,</p>

Indian Institute of Sugar Research and Sugarcane Breeding Institute) and one Commodity Committee (Indian Lac Cess Committee) has not been done. The formal transfer deeds in respect of assets and liabilities of the erstwhile Government Research Institutes and four Commodity Committees have not yet been executed. As mentioned in the subsequent part of this Report, the Secretariat of the Council has not yet been reorganised and it continues to be an attached office of the Department of Agriculture. A bill for declaring the Indian Council of Agricultural Research as an institution of national importance is still under drafting in consultation with the Ministry of Law. The Committee desire that the reorganisation of the new set up of the Council should be completed without further delay and would like to know the action taken by Government in that behalf.

2 1.18

The Committee hope that the Indian Council of Agricultural Research will play effective role in not only strengthening agricultural research and animal husbandry but also establishing proper co-ordination in the research work and education throughout the country.

3 11.9

The Agricultural Research Review Team (1964) had also suggested bringing under the control of Indian Council of Agricultural Research, certain other organisations dealing with agricultural research. The Committee particularly wish to refer to research work in regard to coffee, tea and rubber, at present being done under the control of the respective Boards which work under the Department of Foreign Trade. According to the Review Team, "Technical staff

practically work in isolation and are denied the benefit of meeting and discussing common problems with staff of identical discipline in the agricultural department." The Study Team of the Administrative Reforms Commission have also pointed out the need for bringing the research respects of these Boards under the overall purview of Indian Council of Agricultural Research. The shortcomings in the research work pointed out by the Study Team are lack of competent men to work in their research posts, lack of expert guidance in their respective subject matter fields and influence of non-scientists on research workers and research programmes. In view of the importance of the three commodities for internal consumption and export, the Committee would urge the Government to pay serious attention to the inadequacy of research work and examine how far the situation can be improved by bringing this work under the purview of the Indian Council of Agricultural Research or establishing closer coordination between the Boards and I.C.A.R.

- 4 1.20 Ministry of Agriculture (I.C.A.R.) The Committee desire that Government should also examine the feasibility of bringing other research organisations concerned with agricultural research under the purview of the Indian Council of Agricultural Research.
- 5 1.36 The Committee are dissatisfied over the Indian Council of Agricultural Research holding large amounts as their closing balances at the end of the years 1966-67, 1967-68 and 1968-69. The clos-

ing balance was Rs. 104.67 lakhs for 1966-67, Rs. 181.80 lakhs for 1967-68 and Rs. 201.56 lakhs for 1968-69. The sources of income of the Council are from the cess levied under the Agricultural Product Cess Act, 1940, and grants received from Government of India. In paragraph 21 of their 35th Report (1964-65), the Committee had pointed out that Government continued to give grants to the Council year after year without considering the financial position of the latter and even properly scrutinising the schemes. With the reorganisation of the Council from 1st April, 1966, the quantum of Government grants has been increased to meet expenditure on their expanding activities. The Committee desire that the Government grants required for the expenditure of the Council should be determined realistically. The quantum of cash grants should be carefully determined taking into consideration the estimated receipts from cess and the after receipts from encashment of securities due to mature during the particular year.

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1.17

The Committee are disressed that there has been an element of unspent balance each year arising out of the drawal in March of sums required during April of the next year. It has been said that the Council has recently approached the Ministry of Finance for sanction of interest free ways and means advances to the Council equal to the requirement of funds for drawal so that the recurrence of intentional-over drawal of funds during one year to meet a part of the requirement of the next year is avoided. The Committee suggest that a suitable procedure should be worked out to meet the situation.

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7	1.38	Ministry of Agriculture (I.C.A.R.)	The Committee hope that under the new system of release of grants to the Council in instalments, drawal of funds more than the requirement for the year will be avoided.
8	1.39		The Committee note that there has been delay in surrender/adjustment of unspent balance of Government grants due to delay in compilation of accounts and audit thereof. The unspent balances for 1966-67, 1967-68 were adjusted during 1969-70 and those relating to 1968-69 and 1969-70 would be adjusted during 1970-71. The Committee hope that with the finalisation of the accounting system, adjustment of unspent amounts of Government grants will invariably be made during the following year.
9	1.45		The Committee find that with the reorganisation of the Indian Council of Agricultural Research, there has been considerable increase in the expenditure on the administration. The administrative expenditure of the Council increased from Rs. 40.14 lakhs in 1966-67 to Rs. 71.80 lakhs in 1969-70. The Committee feel that the administrative expenditure of the Council needs to be reviewed with a view to putting it under check and making sure that the increase was commensurate with the expansion of the activities of the Council and the resultant benefits.
10	1.46		From the data furnished to them, the Committee find that the administrative staff of the Council and the various research insti-

tutes etc. has been increasing from year to year. The total administrative staff increased from 1739 in 1966-67 to 2326 in 1969-70. Class IV (Non-technical) staff increased from 2236 in 1967-68 to 3295 in 1969-70. During the year 1969-70 as against 2579 scientific staff, there were 2179 technical staff, 2326 administrative staff and 5814 Class IV staff (2519 skilled/technical and 3295 others). The Committee have also been furnished with a statement showing ratio between administrative expenditure and scientific expenditure at the headquarters and the research institutes of the Council. The Committee find that the ratio varies from institute to institute. While the ratio between administrative and scientific expenditure was 1:2.33 in the National Dairy Research Institute during 1969-70, it was 1:11.53 in the Indian Grassland and Fodder Research Institute. The ratio of expenditure varied in the same institute from year to year. In the Institute of Horticulture Research this ratio ranged from 1:17.00 in 1967-68 to 1:8.24 in 1968-69 and 1:4.02 in 1969-71. The Committee feel that not only there is considerable increase in the administrative, technical and Class IV staff but also their proportion to the scientific staff seems to be on the high side. The Committee, therefore, desire that staff position in the headquarters of the Council as well as in various research institutes should be reviewed by an independent organisation with a view to assessing the requirements. That organisation should also lay down guidelines or norms regarding ratio of scientific, technical and administrative staff for the various institutes. The imbalance in staff should be suitably corrected.

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11	1.47	Ministry of Agriculture I. C. A. R.	<p>The Committee regret to note that there is delay in the reorganisation of the Secretariat of the Indian Council of Agricultural Research. It was decided in March, 1965 that the present ICAR Secretariat which is functioning as an attached office to the Department of Agriculture might be converted into an office wholly financed and controlled by the Council from a date to be appointed. The Secretariat, however, continues to be an attached office of the Department of Agriculture being manned by partly Government side staff and partly by non-Government (Research side) staff. The Committee desire that the amalgamation of Government side staff and non-Government side staff should be expedited. The Committee hope that while fixing the seniority of the staff it will be ensured that the research side staff do not suffer.</p>
12	2.6	-do-	<p>The Committee appreciate that the launching of All-India Coordinated Research Projects on important problems is a big step in avoiding overlapping of research efforts by different agencies in the country. All India Coordinated Research Projects were launched in 1965 on rice, wheat, sorghum, bajra, maize and pulses under the leadership of the National Projects Coordinator. In 1968-69, the number of such projects increased to 29. The Committee hope that the target of 60 projects during the Fourth Plan will be achieved. The Committee would like to watch the progress in this regard.</p>

- 13 2.7 -do- The Committee note that the Indian Council of Agricultural to establish coordination with State Government institutions, Agricultural Universities and other organisations, like collation of research information, organisation of symposia etc. The Committee desire that the impact of these measures on strengthening the research work should be kept under review so that these can be suitably modified/augmented in the light of experience.
 - 14 2.8 -do- The Committee desire that in view of the general problem of low yields in the country, the Council of Agricultural Research should examine whether the present machinery for studying the methods followed and research work done in other countries requires strengthening.
 - 15 2.12 -do- The Committee appreciate that by and large the Central Institutes take up research on National problems which override State boundaries. In view of the fact that different agencies e.g. Central Institutes, State Institutes and agricultural universities are at present doing research work, the Committee feel that it is necessary to lay down some guidelines regarding roles of these agencies with a view to avoiding duplication.
 - 16 2.18 -do- The need for reviewing the existing research stations currently run by the Centre has been emphasised by the High Level Committee of the Ministry of Food and Agriculture in 1962 and the Study Team of the Administrative Reforms Commission in 1967. In his letter addressed to the Agriculture Ministers of the States in 1965, the Minister of Food and Agriculture while pointing out
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the need for review of the research stations of States observed: "The scope as well as the need for such a review are obvious from the fact that while in a country like the United States there are only about 200 agricultural research stations, we have over a thousand in India. Most of our stations are both ill-equipped and inadequately staffed." The Study Team of A.R.C. have observed: "A review of all the Research Stations and Farms currently being run by the Centre should be made by competent experts and action should be taken to close down such of the stations and farms which are not running on reasonable standards and the remaining should be handed over to the States. The Centre should only maintain national and all-India institutions and farms." The Committee have been informed that at a meeting of the Directors of Institutes held in June, 1970, it was decided that an assessment should be made of the role played by each regional or sub-station of the I.C.A.R. Institutes and the purpose served by each. Wherever it was felt that the sub-station served a useful purpose and was not duplicating the work of State agency, such stations should be kept. Regarding others, recommendations may be made to the ICAR for winding up or handing over the stations to the appropriate State agencies. The Committee regret that although the need for reducing the number of research stations has been felt for a long time, no concrete steps have been taken towards this direction. The Committee desire that a time-bound programme should be drawn up to implement the deci-

sion taken at the meeting of the directors of the Institutes held in June, 1970, and the Committee informed of the progress made in this behalf.

- 17 2.19 Ministry of Agriculture I.C.A.R. The Committee desire that the question of intensifying the research at Research Stations under the State Governments should also be pursued with them.
- 18 2.25 -do- The Committee note the other measures taken by the ICAR Research propose to launch an all-India coordinated project on dry farming during the Fourth Plan, covering most of the States where dry farming is practiced. In view of the fact that the dry land area constitutes about 80 per cent of the country, the Committee desire that the project should be made fairly comprehensive covering all the States where dry farming is undertaken.
- 19 2.34 -do- The Committee would like to emphasize that the research efforts for improvement of dry farming technology should be made with a sense of urgency, so that the application of the improved technology in the dry-farming areas may help increase the food production.
- From the information furnished to them, the Committee gather that the communication of results of research to cultivators is primarily the responsibility of the Directorate of Extension and Training of the Ministry of Food and Agriculture. The Committee find from the Report of the Study Team of the Administrative Reforms Commission that "as it is organised today, the Extension Directorate is handling functions most of which are entirely the responsibility of the States." The Study Team have recommended
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that "the Directorate of Extension in the Ministry of Food, Agriculture, Community Development and Cooperation should be abolished forthwith. Functions relating to international aspects, national obligations and responsibilities pertaining to extension and coordination among the States should be handled by a top level technical specialist in extension of the rank of Joint Secretary. He should work in close coordination with the ICAR." The Committee attach utmost importance to the communication of the results of research work to the farmer and would like the Government to consider whether any change in the set-up is necessitated to handle this task.

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2.35 Ministry of Agriculture I.C.A.R

The Committee note that five institutions of I.C.A.R. have extension services and it was proposed to provide extension units to almost all the institutes during the Fourth Plan. The institutions of the ICAR also communicate the results of research to the farmers through National demonstration, publicity in newspapers and attending to the problems of farmers. The Committee hope that the extension work by the I.C.A.R. will be done in close coordination with other organisations and made really effective.

The Committee suggest that it should be examined whether adequate arrangements exist for the practical training of farmers so that they may adopt improved technology to increase agricultural production.

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2.37

-do-

The Committee suggest that the High Powered Achievement Audit Committees proposed to be set up to review the working of the various research institutes would also include some scientists from outside the Indian Council of Agricultural Research.

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3.13

-do-

The Committee are glad to note the good research work done by the Indian Council of Agricultural Research on high yielding new dwarf wheat varieties which has resulted in wheat revolution during the past few years. The total production has increased from 113.93 lakhs tonnes in 1966-67 to 165.40 lakhs tonnes in 1967-68 and 186.52 lakh tonnes in 1968-69. The latest average of wheat yields (1250 Kg/ha) compare favourably with other countries. The Committee hope that efforts will continue to achieve still higher yields and to meet the demand for somewhat shorter duration varieties to promote intensive cropping. Efforts should also be made to enrich the protein content of wheat. Early steps should be taken to study the types of wheat required for the manufacture of wheat products like samolina, noodles, biscuits etc.

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The problem of growing the new high yielding strain under extensive cropping condition is that it may lead to micronutrient deficiency which may limit the yield. The Committee desire that research effort should be intensified on the micronutrient requirement of this crop.

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3.15

-do-

The Committee are, however, concerned to note that with the introduction of the high yielding varieties, the insect pest problem which was not very much evident in wheat cultivation is assuming

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			serious proportions. The Committee desire that serious attention should be paid to the problem and studies on the incidence of pests should be taken up alongwith suitable controlled measures.
24	3.16	Ministry of Agriculture (I.C.A.R)	The Committee have been informed that upto now yield increases have been obtained mostly under irrigated conditions. The Committee consider it important that efforts should be made to evolve the varieties and suitable agronomic schedules for raising the yield under dry farming and drought conditions.
25	3.36	-Do-	The Committee find that researches taken up so far have resulted in the evolution of high yielding varieties of rice suited for different environments, but the impact of the research results on production is not very much noticeable. The total yield of rice in the country is stated to have increased from 353.31 lakh tonnes in 1966-67 to 376.12 lakh tonnes in 1967-68 and 397.62 lakh tonnes in 1968-69. The yield per hectare is the lowest in India being 1550 Kg. against 5750 Kg. in Japan. The limiting factor in increasing the yields of paddy crop has been the incidence of some serious diseases and pests like bacterial blight, gall midge, stem borers which affect the crop. The Committee hope that besides formulating chemical control measures, the research efforts will be intensified to evolve varieties with a built-in resistance to the disease and pests which afflict the crop.
26	3.37	-Do-	Another problem requiring serious attention is improvement

of water management. The Committee desire that the research programmes on this important problem should be strengthened. The Committee feel that the present training facilities for the farmers in growing the dwarf varieties, adoption of plant protection schedules and water management practices need to be expanded.

27 3.38 Do.

In view of the fact that most of the area under rice is under rain-fed conditions, the Committee emphasise that for a breakthrough in rice production in these areas, better varieties specifically suited to tolerate or escape the water shortage and suitable agronomic practices for maximising yields under these conditions should receive special attention. Further, for obtaining good yields, researches on balanced use of fertilisers including micronutrients should be intensified.

28 3.39 Do.

The Committee feel that efforts should be continued to evolve high yielding varieties with increased nutritional quality suitable to Indian condition.

29 3.59 Do.

The Committee are glad to note that the level of jute production per hectare in India is the highest (1290 kg. per hectare) as compared with other countries (Pakistan 280 kg. per hectare, and Brazil 1050 kg. per hectare). The Committee are, however, concerned to note the fall in production of jute during the year 1968-69 to 35.52 lakh tonnes from 63.20 lakh tonnes in 1967-68. The Committee have been informed that the decrease in production was due to unfavourable weather conditions experienced in 1967-68 to 1969-70. All the same, the Committee desire that the research on jute should



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			be intensified. The Committee hope that as a result of improvement in technology, the jute production will be stepped up in the subsequent years and the requirements of the country fulfilled.
30	3.60	Ministry of Agriculture (I. C. A. R.)	From the information furnished to them, the Committee find that new jute varieties which are better yielding than the present one, have been released for cultivation. The Committee hope that the new varieties would push up the yield per hectare of this crop. The Committee desire that efforts should continue to be made to evolve new varieties which will possess the desirable qualities like resistance to premature flowering and non-shattering of pods.
31	3.61	Do.	The Committee hope that agronomic studies pertaining to the time of application of fertilisers, time of sowing, harvest, rotation etc. will be intensified. In view of the fact that studies in crop rotation have brought out the possibilities of growing two, three or four crops in rotation with jute, efforts should be intensified to evolve short duration varieties of jute. Necessary steps should also be taken to improve the quality of jute.
32	3.62	Do.	The Committee note that work on plant protection carried out has enabled the formulation of plant protection schedules and resulted in gains upto Rs. 300 to 500 per hectare. The Committee desire that results of the research in this behalf should be suitably disseminated to the cultivators by arranging for their training so as to increase jute production.

The Committee are concerned to find that, the yield of cotton in India is the lowest (120 kg/ha) as compared with other countries (USSR 840 kg/ha, UAR 640 kg/ha). There has been no appreciable increase in the production of cotton in recent years. This leads to the conclusion that research work undertaken so far has not resulted in stepping up of production of cotton in the country. The total yield of cotton in the country was 49.73 lakh tonnes in 1966-67, 54.54 lakh tonnes in 1967-68 and 52.70 lakh tonnes in 1968-69. It has been stated that the average yield in India is the lowest because 80 per cent of the cotton grown in this country is under rainfed conditions while in other countries it is grown under conditions of assured irrigation. The Committee have been informed that the research programme on cotton is strongly oriented towards increase in production. The twin object of improving the per acre yield and simultaneously securing qualitative improvement of fibre and spinning properties has been set forth for the newly developed varieties, since the country requires both quantitative as well as qualitative self-sufficiency in cotton in respect of various staple lengths and spinning cotton groups. The Committee desire that research to evolve high spinning varieties of cotton should be intensified and a phased programme drawn up in this behalf so that India can become self-reliant in this vital field.

In view of the fact that 80 per cent of the total cotton area is rainfed, the Committee desire that the future activities should in particular be devoted to evolving short duration and high yielding varieties. It is very essential to increase the total production of

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			cotton grown in the country by introducing better agronomic schedules for both irrigated and rainfed conditions. Efforts should also be intensified to evolve disease resistant and insect resistant high yielding varieties.
35	3.103	Ministry of Agriculture (I. C. A. R.)	The Committee are concerned to note that the oilseed production which touched a peak of 8.45 million tonnes in 1964-65 dropped to 6.9 million tonnes in 1968-69. From the figures of average yield per hectare yield per hectare given in respect of groundnut, the Committee find that the yield in India is the lowest (760 kg/ha) as compared with other countries Japan 2190 kg/ha, USA 1980 kg/ha).
36	3.104	Do.	The Committee feel that there is an urgent need to increase the per hectare yield of oilseed crops which are mostly grown under rainfed conditions. The research effort should be intensified to build up resistance to major pests and diseases that affect these oilseed crops. In other achieve higher yields, it is also essential that the varieties evolved need to be drought resistant or drought escaping. For this purpose suitable agronomy for cultivation for these crops in dry lands needs to be paid special attention.
37	3.105	Do.	The Committee have been informed that in view of the fact that India's vegetable fat economy is in the main based on groundnut, a crop of uncertain performance, diversification of our vegetable resources has become essential. With this object in view, some

Russian varieties of sunflower have been introduced and feasibility studies are under way. The Committee desire that intensive studies should be made in the selection of suitable strains for the various areas and agronomic and other schedules for successful growing of the crop should be evolved.

The Committee are distressed to note that average milk yield per milch cattle in India is very low. The average yield per milch cow per annum in India 448 kg. as against 4001 kg. in USA, 3875 kg. in Denmark, 3830 kg. in U.K., 3650 kg. in Sweden, 2966 kg. in New Zealand and 2300 kg. in Australia. Committee have been informed that in order to increase milk production, the Council have taken up cross-breeding of Indian cattle with exotic breeds in different parts of the country. Certain development projects in collaboration with foreign countries have been taken up to introduce exotic breeds for increased milk production. The Council has also drawn up an All India Coordinated Research Project on improvement of cattle for milk production whereby it is proposed to study the combining ability of important indigenous breeds with exotic breeds. The Council have also formulated All India Coordinated Research Projects for the improvement of buffaloes and goats. The Committee desire that the research efforts to improve the cattle should be intensified with a view to increasing the milk yield.

The Committee note the research work done by the National Dairy Research Institute in regard to cattle feed, fodder, milk, milk products, chemistry, bacteriology, etc. The Committee desire that

close coordination should be maintained with the industry so that these research processes are actually put to use. The coordination with the industry should also be aimed at taking up on priority basis research projects which would help resolve the problems that are facing them. The figures furnished to the Committee show that at present only a few problems are referred to the Institute by the State Governments, industry, farmers etc. During the years 1967-68, 1968-69 and 1969-70, the number of problems referred to the Institute was 14, 13 and 12 respectively. The Committee would like to know about the efforts made to establish closer coordination with the industry.

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Ministry of Agriculture
(I. C. A. R.)

The Committee find that during the year 1969-70, the Institute took up seven fresh schemes for research while there were 50 continuing schemes already under research. Some of the schemes which were commenced more than 10 years back are still continuing. The Committee desire that the reasons for delay in completion of the old schemes should be analysed and necessary action taken to complete them.

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4-16

Do.

The Committee are not satisfied over heavy accumulation of unsold publications of the Indian Council of Agricultural Research, particularly scientific monographs which have a limited demand. A large number of copies of the publications published as early as 1960 are still lying in stock. The Committee have been informed that as

on 31st March, 1970, the total value of the unsold publications increased to Rs. 15.74 lakhs of which the scientific monographs accounted for 7.60 lakhs and semi-technical publications Rs. 8.14 lakhs. The Committee desire that in the light of the experience of Council regarding the sale/issue of the publications, the print order of both scientific monographs and semi-technical publications should be carefully fixed. In their opinion the print order of scientific monographs should be kept to the minimum.

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| 41 | 4.17 | Do | The Committee desire that vigorous steps should be taken to reduce the stock of old publications by adopting various sales promotion measures and by distribution of copies to libraries, Agricultural Universities, Research Institutes etc. |
| 42 | 4.25 | Do. | The Committee find that two of the five journals published by the Indian Council of Agricultural Research are still being sold below the cost price. The Committee desire that steps should be taken to make all the Journals self-supporting by reducing the cost of production or increasing the sale price. |
| 43 | 4.27 | Do. | The Committee are of the view that one of the factors contributing to the cost of production of publications of the Indian Council of Agricultural Research is the use of art paper. The Committee suggest that the publications and annual reports may be printed on ordinary paper. A few copies required to be sent to foreign countries, embassies etc. may, however, continue to be printed on art paper. |
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44	4.31	Ministry of Agriculture (I. C. A. R.)	<p>The Committee consider that there is need for publishing books of semi-technical and general nature in regional languages also so that they may be of use to the farmers. They note that in the whole country for this purpose the Indian Council of Agricultural Research are at present utilising the services of the Regional Assistant Editors who have been appointed to feed the news in regional languages. The Committee would suggest that the question of bringing out publications in regional languages may be taken up by the Council with State Governments.</p>
45	4.50	Do.	<p>From the information furnished to them, the Committee find that the number of books, journals etc. published by the Indian Council of Agricultural Research during the years 1966-67 to 1969-70 was 38,49,38 and 43 respectively. The expenditure on staff employed on publications wing increased from Rs. 7.26 lakhs in 1967-68 to Rs. 7.87 lakhs in 1968-69 and Rs. 8.31 lakhs in 1969-70. The posts of technical and supporting ministerial staff during 1969-70 numbered 130 including a number of senior posts. Considering that the number of books, journals, etc. brought out by the Council during the last four years ranged from 38 to 49 the Committee feel that staff employed for the purpose is not fully justified. Elsewhere in this report, the Committee have already recommended that the staff of the Council as a whole should be reviewed by an independent body.</p>

5.8 Ministry of Agriculture
(I. C. A. R.)
Industrial Development.

The Committee are surprised that in this case while the Directorate General, Technical Development cleared the foreign exchange of Rs. 3.43 lakhs for purchase of the spinning machinery, they appear to have dealt with in a routine manner the request of the laboratory for sanctioning foreign exchange amounting to only Rs. 13,500 required for certain components in the Air-Conditioning Plant without which the spinning machinery could not be installed. Even after the efforts made to explore the possibility of getting the air-conditioning plant from the indigenous sources had failed, the DGTD did not clear the foreign exchange component of Rs. 13,500. Although after establishment of their factory in India the manufacturer reduced in November, 1965 the foreign exchange requirement from Rs. 13,500 to Rs. 3,600 (later revised to Rs. 4,860 consequent on the devaluation of the rupee), the total cost of the air-conditioning equipment was increased from Rs. 67,500 quoted in 1963 to Rs. 1,62,000 in 1965 due to increase in cost of raw materials, labour charges and excise duty. Ultimately, a contract was finalised with the firm in September, 1967 for Rs. 2,61,000 which included Rs. 36,000 for a stand-by compressor and Rs. 63,000 towards the cost of ancillary works. The Committee are unhappy that delay in clearance of foreign exchange component of Rs. 13,500 in 1963 resulted in extra cost of the air-conditioning equipment to the tune of Rs. 94,500. Besides extra cost paid for the procurement of the air-conditioning plant, the installation of the costly machinery valued at Rs. 4.60 lakhs (foreign exchange expenditure Rs. 3.43 lakhs) in the new building was delayed. The Committee feel that responsibility should be

fixed for the delay at various stages in this case. The Committee desire that necessary steps should be taken by the Director General, Technical Development to prevent recurrence of such cases.

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5.19

Ministry of Agriculture
(I. C. A. R.)

The Committee are not satisfied over a large amount of Rs. 691.46 lakhs outstanding for want of utilisation certificates in respect of grants paid by the Indian Council of Agricultural Research upto 31st March, 1969. The Committee are particularly concerned about the pendency of the old utilisation certificates. The amount outstanding in respect of the grants issued upto 1966-67 is Rs. 157.29 lakhs which includes Rs. 45.27 lakhs paid upto 31st March, 1964. Besides an amount of Rs. 24.61 lakhs was outstanding in respect of grants given by the erstwhile Commodity Committees. The Committee desire that any procedural difficulty in the issue of utilisation certificates in the old cases should be discussed with Audit with a view to clear the arrears. The Committee would like to know the concrete measures taken in this behalf and the progress achieved.

The Committee note that according to the Council's revised schedule of terms and conditions, further payments of grants should be stopped unless audit utilisation certificates were furnished by grantees within a period of two years. The Committee hope that the revised procedure will be strictly followed in future in order to avoid accumulation of utilisation certificates.

- 48 5 23 Do. The Committee find that out of Rs. 44.64 lakhs advanced to the various parties during the years 1958-59 to 1966-67 a sum of Rs. 2.22 lakhs is still pending adjustment. The Committee desire that efforts should continue to be made to adjust the outstanding amount. Necessary steps should also be taken to ensure that the advances are adjusted promptly in future.
- 49 5 31 Do. The Committee are concerned to note that the proforma accounts of the Biological Products Division of the Indian Veterinary Research Institute, Izatnagar disclosed a net loss amounting to Rs. 2.00 lakhs in 1966-67, Rs. 2.81 lakhs in 1967-68 and Rs. 2.59 lakhs in 1968-69. The Committee desire that necessary action should be taken to increase the selling price of the products based on the proforma accounts of 1967-68. The Committee suggest that the institute should lay down a procedure for periodical review of the selling prices of the products so as to ensure that no losses are suffered on the sale. The Committee also suggest that the administrative expenditure of the institute should be kept under check.
- 50 5 36 Do. The Committee would like the Indian Council of Agricultural Research to examine whether it is desirable to have the present degree of meticulous accounting in the case of small left-overs like test tube holders etc. after the schemes are completed. The Committee are of the view that the question of the recovery of their cost should be limited to important items. This would avoid delay in assessment and recovery of the assets left with the grantee. The Committee would like to know the outcome of the examination.
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51	5.39	Ministry of Agriculture (I. C. A. R.)	The Committee note that the outstanding amount for recovery from various parties for publications, products sold on credit by the Council and its institutions has been reduced from Rs. 16.36 lakhs as on 31st March, 1969 to Rs. 9.82 lakhs as on 30th June, 1970. The Committee urge that vigorous efforts should be made to recover the outstanding amount and that the dues should not be allowed to accumulate in future.
52	5.42	Do.	The Committee deprecate the delay of about seven years in utilising the Freeze Drying Apparatus purchased in 1964 for Rs. 10,000 for want of certain parts costing about Rs. 900. The Committee hope that early action will be taken to put the equipment in order. The Committee desire that responsibility should be fixed for the delay in putting the equipment in order.
53	5.44	Do.	The Committee feel that there has been unconscionable delay of more than 14 years in replacing the compressor of Stroke Freeze Drying Unit purchased in July 1956 at a cost of Rs. 33,955. The Committee suggest that responsibility should be fixed for the delay. The Committee desire that the compressor should now be procured expeditiously and the equipment commissioned. The Committee would like to know the progress made in this regard.
54	5.46	Do.	The Committee regret to observe that this is another case where the installation and commissioning of costly equipment pur-

chased in July 1967 for Rs. 1,16,340 was delayed. The Committee desire that responsibility should be fixed for the delay.

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5-50

Do.

The Committee regret to point out that there was lack of planning in this case, as a result of which the foreign expert arrived in India several months in advance of the construction of building and the arrival of the plant and machinery that he was required to instal therein. The Committee feel that had proper liaison been maintained with the supplier about the supply of the plant and machinery, the time of delivery could have been known. In case delay was anticipated in the delivery of the plant and machinery, the arrival of the expert in India could have been deferred and the extension of his assignment for a further period of six months and extra expenditure avoided.

149

Sl. No.	Name of Agent	Agency No.	Sl. No.	Name of Agent	Agency No.
DELHI					
24.	Jain Book Agency, Connaught Place, New Delhi.	11	33.	Oxford Book & Stationery Company, Scindia House, Connaught Place, New Delhi-1.	68
25.	Sat Narain & Sons, 3141, Mohd. Ali Basar, Mori Gate, Delhi.	8	34.	People's Publishing House, Rani Jhansi Road, New Delhi.	76
26.	Atma Ram & Sons, Kashmir Gate, Delhi-6.	9	35.	The United Book Agency, 48, Amrit Kaur Market, Pahar Ganj, New Delhi.	88
27.	J. M. Jaina & Brothers, Mori Gate, Delhi.	11	36.	Hind Book House, 82, Janpath, New Delhi.	95
28.	The Central News Agency, 23/90, Connaught Place, New Delhi.	15	37.	Bookwell, 4, Sant Narsankari Colony, Kingsway Camp, Delhi-9.	96
29.	The English Book Store, 7-L, Connaught Circus, New Delhi.	20	MANIPUR		
30.	Lakshmi Book Store, 42, Municipal Market, Janpath, New Delhi.	23	18.	Shri N. Chaoba Singh, News Agent, Ramlal Paul High School Annex, Imphal.	75
31.	Bahree Brothers, 188 Lalpatra Market, Delhi-6.	27	AGENTS IN FOREIGN COUNTRIES		
32.	Jayans Book Depot, Chapparwala Kuan, Karol Bagh, New Delhi.	66	19.	The Secretary, Establishment Department, The High Commission of India, India House, Aldwych, LONDON W.C.-2.	69

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