調査団員氏名

担　当	氏　名	所　　属
官団員		
総括	大島　勝彦	国際協力事業団無償資金協力調査部 調査審査課課長
種子生産計画	大友　輝男	農林水産省東北農政局生産流通部 農産普及課農政調整官
種子研究計画	長峰　司	農林水産省国際農林水産業研究センター 沖縄支所世代促進研究室長
コンサルタント団員		
開発計画	田辺　修	（財）日本国際協力システム 業務第二部計画調査課
施設・機材計画	吉野　治伸	（財）日本国際協力システム 業務第二部計画調査課

調査日程

日順	月日（曜日）	調　査　内　容
1	8月　2日（火）	移動　東京→ｼﾝｶﾞﾎﾟｰﾙ(JL719) ｼﾝｶﾞﾎﾟｰﾙ→デリー(SQ408)
2	8月　3日（水）	ＪＩＣＡ事務所打ち合せ、大使館表敬、大蔵省表敬 農業省農業研究教育局表敬及び協議
3	8月　4日（木）	インド農業研究所協議、国立植物遺伝資源局訪問協議
4	8月　5日（金）	インド農業研究所カルナル試験場訪問協議
5	8月　6日（土）	団内打ち合せ、資料整理
6	8月　7日（日）	資料整理
7	8月　8日（月）	世銀表敬及び協議、ＵＳＡＩＤ表敬及び協議、 インド農業研究所協議
8	8月　9日（火）	団内打ち合せ、インド農業研究所協議、ミニッツ案の作成
9	8月１０日（水）	ＪＩＣＡ事務所協議、大使館調査経過報告、世銀協議
１０	8月１１日（木）	ミニッツ署名、農業省訪問協議 官団員　移動　デリー→バンコク(TG955)
１１	8月１２日（金）	官団員　移動　バンコク→東京(TG672) コンサル団員　インド農業研究所協議、資料収集
１２	8月１３日（土）	資料収集、整理
１３	8月１４日（日）	資料整理
１４	8月１５日（月）	団内打ち合せ、資料整理
１５	8月１６日（火）	インド農業研究所協議、資料収集
１６	8月１７日（水）	NATIONAL SEEDS CORPORATION LTD. 訪問及び協議 MAHARASHTRA HYBRID SEEDS CO. LTD. 訪問及び協議 ＪＩＣＡ事務所調査経過報告
１７	8月１８日（木）	インド農業研究所カルナル試験場訪問協議
１８	8月１９日（金）	インド農業研究所協議、ＪＩＣＡ事務所報告
１９	8月２０日（土）	インド農業研究所所長挨拶
２０	8月２１日（日）	移動　デリー→バンコク(TG915)
２１	8月２２日（月）	移動　バンコク→東京(TG640)

インド農業研究所優良種子開発計画事前調査面会者リスト

在インド日本大使館

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広瀬　道雄	一等書記官
福嶋　正人	一等書記官

ＪＩＣＡ　インド事務所

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Mrs. RAMA MURALI	Joint Secretary（局長）
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Mr. MOOL CHAND	Section Officer

農業省－Ministry of Agriculture

農業研究教育局－Department of Agricultural Research and Education (DARE)

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Dr. H. C. GAUR	Under Secretary
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Mr. A.S. SETHI	Desk Officer (IC)
Dr. P. KAEES	Senior Scientist (Seed)

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Dr. S.K. SINHA	Director
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P. LAL	Head of Division of Entomology
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Dr. N. C. SINGHAL	Prof. of Division of Seed Science and Technology
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Dr. ASHOK GAUR	Senior Scientist
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Dr. M. M.VERMA	Senior Scientist
Dr. SURENDRA PAAKASH	Senior Scientist
Dr. MALAVIKA DADLAUI	Senior Scientist

国立植物遺伝資源局－National Bureau of Plant Genetic Resources (NBPGR)

Dr. R. S. RANA	Director
Dr. K. P. S. CHANDAL	Joint Director
Dr. R. K. SAXENA	Head of Division of Conservation

インド農業研究所カルナル地域研究所－IARI Regional Station KARNAL

Dr. K. S. RANDHAWA	Principal scientist & Head
Dr. S. N. SINHA	Principal scientist (Entomology)
Dr. VINOD K. PANDAITA	Scientist Sr. Scale (Hoticulture)
Dr. SURENDER KUMAR	Scientist (Plant Breeding)
Dr. S. S. ATWAl	Scientist Sr. Scale (Plant Breeding)
Dr. AHARAM SINGH	Senior Scientist (Pathology)
Dr. B. S. MODI	Senior Scientist (Processing & Storage)
Dr. R. K. KHOKAr	Scientist (F. S.)
Dr. RAM NIWAS YADAV	Scientist (Plant Breeding)
Dr. B. K. DUTT	Senior Scientist
Mr. NEELAM KUMAR CHOPRA	Scientist (Agronomy)
Mrs. NISHE CHOPRA	Scientist (Agronomy)
Mrs. ANUJA GUPTA	Scientist (Plant Pathology)

ＩＣＡＲ小麦研究計画局－Directorate of Wheat Research KARNAL

Dr. NEGAREGEN	Director

世銀－THE WORLD BANK

Mr. HARIDEEP SINGH	Financial Analyst
Dr. M. BALASUBRAMANIAN	Agricultural Research Specialist

ＵＳＡＩＤ－U. S. AGENCY FOR INTERNATIONAL DEVELOPMENT

Mr. D. R. ARORA	Office of Technology Development & Enterprise

National Seeds Corporation LTD.

Mrs. DEEPIKA PADDA	Executive Director & Chief Vigilance Officer
Dr. V. SANKARAN	Dy. General Manager (QC)
Mr. T. D. TEWART	General Manager (Finance)
Mr. RASIV VAIDYA	General Manager (Marketing)
Mr. V. M. RAO	Manager
Mr. DEEPIKA PADDA	Executive Director
Dr. S. P. SINGH	Consultancy & Training Manager
Mr. S. N. RAM	Joint Manager (P)

Maharashtra Hybrid Seeds Co. Ltd.

Dr. AMARJIT SINGH

MINUTES OF DISCUSSION

PRELIMINARY STUDY

ON

THE PROJECT
FOR
DEVELOPMENT OF QUALITY SEED

AT
THE INDIAN AGRICULTURAL RESEARCH INSTITUTE

In response to a request from the Government of India, the Government of Japan decided to conduct a Preliminary Study on the Project for Development of Quality Seed at the Indian Agricultural Research Institute, New Delhi (hereinafter referred to as "the Project") and entrusted the Study to the Japan International Cooperation Agency (JICA). The JICA Team headed by Mr.Katsuhiko Oshima, Director of Study Review & Coordination Division, Grant Aid Study & Design Department, JICA, visited India during August 2-21, 1994.

The Team had a series of discussions with the Indian Officials concerned and conducted a field survey in the study area.

As a result of discussion and field survey, both sides confirmed the main items described on the attached sheets. It was agreed upon to recommend to the respective Govts. to make further arrangements for the smooth implementation of the Project.

New Delhi, August 11, 1994

Mr.Katsuhiko Oshima
Leader
Preliminary Study Team
JICA

Mr.D.K.Reddy,
Director,
Department of Agricultural
Research & Education,
Ministry of Agriculture
Govt. of India

11/8/94

Mr.D.N.Narasimha Raju,
Deputy Secretary
Dept. of Economic Affairs
Govt. of India
Ministry of Finance,

Dr.Mangala Rai,
Asst. Director-General (Seeds)
Indian Council of Agricultural Research

Dr.S.P.Sharma
Head,
Seed Science & Technology Division,
Indian Agricultural Research Institute

ATTACHMENT

1. **Objective**

The objective of the Project is to strengthen research activities on quality seed development at the Indian Agricultural Research Institute (IARI).

2. **Project Site**

i) IARI, New Delhi
ii) IARI, Regional Station, Karnal

3. **Responsible Department and Ministry**

Department of Agricultural Research and Education, Ministry of Agriculture Govt. of India.

4. **Implementing Agency**

The Indian Council of Agricultural Research.

5. **Research Programme**
(as in Annexure-I)

6. **Items Agreed**

After discussion with the Preliminary Study Team, the following items, requested by the Indian side were agreed upon.

(i) The Indian Agricultural Research Institute, New Delhi (as in Annexure–II)
(ii) IARI Regional Station, Karnal (as in Annexure-III)

It was agreed that the list as in Annexures-II & III is subject to the approval of the Govt. of Japan.

7. **Japan's Grant Aid System**

i) The Japan's Grant Aid System was explained by the Japanese Team. (See Annexure-IV)

ii) It was agreed that the Indian side will take necessary measures, as described in Annexure-V for the smooth implementation of the Project on the condition that the Grant Aid by the Government of Japan is extended to the Government of India.

8. Schedule of the Study

If the Project is found feasible as a result of the Preliminary Study, JICA will send Basic Design Team in and around December, 1994.

9. Summary of Discussions

i) The scope of cooperation covered by the scheme of Japan's Grant Aid will be studied and clarified by the Basic Design Team.

ii) The Department of Agricultural Research and Education/ICAR, Ministry of Agriculture [illegible] will allocate the necessary budget and personnel for the Project based on the result of the Basic Design Study.

Annexure - I

DIVISION OF SEED SCIENCE AND TECHNOLOGY
IARI, NEW DELHI -110012

Research Project 1: Characterization of varieties of wheat, rice, mustard, pearlmillet, soybean, castor and mungbean.

Introduction:

Characterization of crop varieties on the basis of morphological and or biochemical traits is an essential aspect of variety development and seed quality control. Determination of distinct, uniform and stable diagnostic characters of each variety help in genetic purity maintenance of crop varieties.

With the recent changes in Seed Policies in India, it has become essential that the diagnostic characters of cultivars of all important agricultural crops are identified and documented. The present project aims for describing varieties of eight important crops on the basis of physical, biochemical and morphological characters of seed, seedling and mature plant. Identification of other distinguishable varieties in pure seed lot and fixing permissible limits for the same also needs to be worked out. The objectives of the programme are as follows:-

Objectives:

1. To develop key characters for varietal identification based on morphological and biochemical characters at all growth stages.

2. To standardize the techniques for identification and permissible limits of other distinguishable varieties (ODV) in pure seed.

Project Term	:	Five Years (1995-1999)	
Budget*	:	Rs. One Million per year	
Manpower*	:	Project Leader	1
		Project Associates	6

Expected Achievement :

1. To develop standardise techniques for describing varieties.
2. To develop illustrated mannuals for the use of breeders and for seed certification agencies.
3. To help in establishing the distinctness of varieties.

* *From IARI available budget & scientific staff strength*

Research Project 2. Improvement of storability of seeds of rice, soybean, sunflower, onion, maize and cole crops.

Introduction

High levels of germination and vigour are essential parameters of seed quality to ensure successful crop establishment. Seed vigour and viability, which attain highest levels at the time of maturity, decline gradually during storage. Considerable variability exists in terms of seed longevity at species and cultivar levels. Thus, crops like soybean, sunflower and onion are very poor storers, whereas in maize, rice and other vegetable crops (specially cole crops) marked varietal differences exist with respect to seed storability. The present project aims at developing physical and/or chemical methods to extend seed storability by controlling the rate of physiological and pathological deterioration. Screening of genotypes and assessment of loss in productivity due to decline in vigour would also help in breeding improved varieties and in taking adequate corrective measures to minimise yield loss respectively.

Objectives

1. To study the mechanism of seed deterioration during short medium and long term storage.

2. To identify suitable packaging materials and conditions for prolonging viability during storage.

3. To study the effect of loss in vigour on productivity.

4. To study the genetic & cytological changes occuring during storage.

Project Term	:	Five years
Budget*	:	Rs. 0.7 million per year
Manpower*	:	Project Leader 1 Project Associates 4

Expected Achievements

1. Identification of better storer genotypes and causes for poor longevity so that this information can be used in breeding programme.

2. Identification of suitable storage and packaging conditions and development of effective treatment for prolonging seed storability under different conditions of storage.

3. Verification of revalidation periods and modifications, if required.

** From IARI available budget & Scientific staff strength*

Research Project 3: Seed-borne diseases and their management in rice, wheat, pearlmillet and soybean.

Introduction

Testing for seed-borne diseases has assumed great importance in the National Programme of Seed Certification and Quality Control. The Government of India (GOI) has fixed standards for seed- borne pathogens of important field crops. However, standardized techniques for the assessment of seed health status have not been presented in the National Rules for seed testing. The project is aimed to generate the technical data for standardisation of the procedure, reviewing of standards and suggest control measures. The information generated through this study will be immensely useful for the seed quality control programme.

Objectives

1. Detection and identification of seed-borne fungi, bacteria and viruses and their mode of further spread and to standardise seed-health testing procedures.

2. Development of suitable preventive and control methods for the production of disease-free foundation and certified seeds.

Project Term	:	Five Years
Budget*	:	Rs. 0.3 million per year
Manpower*	:	Project Leader 1 Project Associates 3 (one from Karnal)

Expected Achievements

1. To standardise the tolerance limits (Standards) of seed borne diseases for certification purpose.

2. To standardise the control measures of seed-borne diseases.

** From IARI available budget & Scientific staff strength*

Research Project 4. Post-harvest handling and management of seeds of cereals, pulses, oilseeds and vegetables for efficient packaging, storage, treatment and sowing.

Introduction

Post-harvest technology play an important role in the production of quality seed. In addition to genetic purity, various physical and physiological attributes determine the seed quality.

In the mechanised seed programme, mechanical or chemical injuries to the seeds during harvesting, threshing and processing operations may affect the seed quality. The damaged areas serve as the centre of accelerated ageing due to higher respiration rate and infection with the microorganisms. The unprocessed seed is not fit for sowing or storage because it is contaminated with weeds and other crop seeds and inert material. It is, therefore, essential to dry, clean grade and treat the seeds before packaging, storage, distribution and sowing in order to avoid hazards in agriculture. The project is aimed to develop the post-harvest technology for the production of good quality seed of cereals, pulses, oilseeds and vegetables of prescribed standards and maintain/upgrade the seed quality before storage and marketing.

Objectives

1. Standardisation of aperture shape and size for grading of seeds of cereals, pulses, oilseeds and vegetables.

2. To maximise the recovery of processed seed by suitable screening, grading etc.

3. Study of relative efficacy of different seed treating methods.

4. Standardisation of seed extraction techniques in tomato, brinjal, chillies, watermelon and muskmelon.

5. Determination of critical temperature and exposure time for mechanical drying of rice, sorghum and maize.

Project Term	:	Five Years
Budget*	:	Rs. 1 million per year
Manpower*	:	Project Leader 1 Project Associates 6 (Two from New Delhi)

** From IARI available budget and scientific staff strength*

Expected Achievements

1. Prevention/minimisation of seed loss by proper processing.

2. Control of seed-transmitted diseases by effective seed-treatment.

3. Development of economically effective and environment-friendly treatments for control of storage pests and diseases.

ANNEXURE-II

List of Items for IARI, New Delhi

1. Seed Storage Facilities for Breeding Stocks and Authentic Samples of Varieties.
2. Growth Cabinet
3. Controlled Temperature Glass House
4. Seed X-Ray Unit
5. Electrophoretic System
6. Micro Centrifuge (Refrigerated)
7. Vacuum Seed Counter
8. Photometer
9. Leaf Area Meter
10. Laboratory Model of Seed Processing Machine
11. Digital Moisture Meter
12. Compound Research Microscope with Photoautomat, Colour Monitor and CCTV Camera
13. ELISA Kit
14. Temperature and Humidity Meter
15. Electronic Balance
16. Electronic Colour Sorter
17. Generator to Support Seed Storage Facility
18. Computer with Laser Printer

ANNEXURE-III

List of Items for IARI Regional Station, Karnal

1. Storage Facilities for Breeder and Nucleus Seed
2. Seed Processing and Packing Facility for Cereals
3. Seed Processing and Packing Facility for Vegetables
4. Laboratory Model of Seed Processing Machine
5. Vacuum Fumigation Chamber
6. Temperature and Humidity Meter
7. Sample Divider
8. Germination Chamber
9. Moisture Meter

Annexure-IV

Japan's Grant Aid

1. Japan's Grant Aid Procedures

The Japan's Grant Aid Program is extended in the following procedures.

1) **Application** (A request made by the recipient country)

Study (the Basic Design Study conducted by JICA)

Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet)

Determination of Implementation (the Notes exchanged between both Governments)

Implementation (Implementation of the Project)

2) At the **first step,** application, a request made by the recipient country, is examined by the Government of Japan (the Ministry of Foreign Affairs), whether or not it is suitable for Grant Aid. If the request is confirmed that it has the high priority as the Project for Grant Aid, the Government of Japan instructs JICA to conduct the Study.

At the **second step,** the Study (the Basic Design Study) is conducted by JICA basically under contracts with a Japanese consulting firm to carry out.

At the **third step** (appraisal & approval), the Government of Japan appraise whether or not a project is suitable for Japan's Grant Aid Program based on a Basic Design Study report prepared by JICA and is then submitted for approval of the Cabinet.

At the **fourth step** the Project approved by the Cabinet is officially determined to implement by signing the Exchange of Notes between both Governments.

In the course of implementation of the Project, JICA will take charge of expediting the execution by assisting the recipient country in terms of the procedures of tender, contract and others.

2. Contents of the Study

1) *Contents of the Study*

The aim of the Study (the Basic Design Study), conducted by JICA, is to provide basic document necessary for the appraisal whether or not a project is viable for Japan's Grant Aid Program. The contents of the Study are as follows.

a) to confirm the background of the request, objectives, effects of the Project and maintenance ability of the recipient country necessary for the implementation

b) to evaluate the appropriateness of the Grant Aid from the technological, social and economical points of views.

c) to confirm the basic concept of the plan mutually agreed upon by discussion between the both sides

d) to prepare a basic design of the Project

e) to estimate the cost of the Project

The contents of the request are not necessarily approved as the contents of the Grant Aid. The basic design of the Project is confirmed along the Japanese Grant Aid scheme.

In the implementation of the Project, the Government of Japan requests the Recipient country to take the necessary measures in order to promote the recipient country's self-reliance. This measures must be guaranteed even if the recipient implementing agency do not have jurisdiction. Lastly the implementation of the Project are confirmed by all relevant organizations in the recipient country by minutes.

2) *Selection of Consultants*

For the smooth implementation of the study, JICA selects the consultant among the consultants registered for JICA by evaluating proposals submitted by those consultants. The consultant carries out the Basic Design Study and composes the Report based upon the terms of reference made by JICA.

At the stage of concluding the contract between a consultant and the recipient country after the Exchange of Notes, JICA recommends the same consultant which participated in the Basic Design Study in order to maintain the technical consistency between the Basic Design Study and the Detailed Design and to avoid the undue delay caused by the selection of a new consultant.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

The Grant Aid Programme provides the recipient country with non-reimbursable funds needed to procure the facilities, equipments and services (labor or transportation, etc.) for economic and social development in that country under the following principals in accordance with the relevant laws of Japan. The Grant Aid is not extended in a form of donation in kind to the recipient country.

2) Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Notes Exchanged between the both Governments, in which the Objectives of the Project, Period, Conditions and Amount of the Grant etc. are confirmed.

3) "The period of the Grant" is within the fiscal year in which the Cabinet approved the Project. Within the fiscal year, all procedure such as exchanging of the Notes, concluding the contract with the consultant and contractor and the final payment to them must be completed.

However in case of the delay of the delivery, installation or construction due to events such as weather, the period of the Grant can be extended for one fiscal year at most by mutual agreement between the both Governments.

4) The Grant is used properly and exclusively for the purchase of the products, in principle, of Japan or the recipient country and the services of the Japanese or the recipient country's nationals. The term "Japanese nationals" means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons.

When the two Governments deem it necessary, the Grant may be used for the purchase of the products or services of the third country (other than Japan or the recipient country).

However in terms of the principle of the Grant, the Prime contractors, that is the Consultant, Contractor and Procurement firm, necessary for the implementation of the Grant are limited to "Japanese nationals".

5) Necessity of the "Verification"

The Government of recipient country or its designated authority will conclude into the contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. The "Verification" is necessary because the source of the Grant is the taxes of Japanese nationals.

6) *Undertakings required of the Government of recipient country*

In the implementation of the Grant, the recipient country is required to undertake the following necessary measures.

(1) To secure land necessary for the sites of the Project and to clear, level and land prior to commencement of the construction

(2) To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites

(3) To secure buildings prior to the procurement in case of the installation of the equipments

(4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant

(5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts

(6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work

(7) *"Proper Use"*

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those to be borne by the Grant Aid.

(8) *"Re-export"*

The products purchased under the Grant should not be re-exported from the recipient country.

(9) *Banking Arrangement (B/A)*

a) The Government of the recipient country or its designated authority should open an account in the name of Government of the recipient country in an authorized foreign exchange bank of Japan

(9) Banking Arrangement (B/A) (contd..)

(hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the contracts verified.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

ANNEXURE-V

Necessary measures to be taken by the Indian side on condition that Japan's Grant Aid is extended:

1. To secure and clear the site necessary for construction of the Project facilities prior to commencement of the Project.

2. To provide the land for temporary site office, warehouse and stock yard during the implementation of the Project.

3. To provide facilities for the Project site such as a distribution of electricity and other incidental facilites.

4. To exempt taxes and to take the necessary measures for customs clearance of the equipment brought for the Project at the port of disembarkation.

5. To exempt Japanese Nationals from customs duties, internal taxes and other fiscal levies which may be imposed in India with respect to the supply of the products and services under the verified contracts.

6. To accord Japanese Nationals, whose services may be required in connection with the supply of products and the services under the verified contracts, such facilities as may be necessary for their entry into India and stay therein for the duration of their work.

7. To use and maintain properly and effectively all the equipment purchased under the Grant.

8. To bear all the expenses other than those to be borne by the Japanese Grant Aid.

9. To bear the commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.

Expected Achievements

1. Prevention/minimisation of seed loss by proper processing.

2. Control of seed-transmitted diseases by effective seed-treatment.

3. Development of economically effective and environment-friendly treatments for control of storage pests and diseases.

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21. AGRICULTURE RESEARCH YEAR BOOK
22. ANNUAL REPORT 1992
    (Division of Seed Science and Technology, IARI)

― 添付資料〈技術資料編〉 ―

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PERCENTAGE OF IRRIGATED AREA TO TOTAL AREA UNDER PRINCIPAL CROPS IN INDIA DURING THE YEAR 1990-91 (PROVISIONAL)

STATE	RICE	JOWAR	BAJRA	MAIZE	WHEAT	BARLEY	TOTAL CEREALS	GRAM	TOTAL PULSES	TOTAL FOOD GRAINS	GROUND NUT	RAPE-SEED & MU-STARD	TOTAL OIL SEEDS	SUGAR-CANE	COTTON	TOBACCO	TOTAL (UNDER ALL CROPS)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ANDHRA PRADESH	94.9	1.6	13.4	26.5	80.0	-	65.5	2.3	1.2	52.0	19.8	-	17.5	98.7	12.5	29.9	40.7
ARUNACHAL PRADESH	26.2	-	-	-	-	-	17.5	-	-	16.9	-	-	-	-	-	-	13.0
ASSAM(a)	33.8	-	-	-	-	-	33.6	-	9.3	32.6	-	-	-	-	-	-	15.1 *
BIHAR	35.4	-	-	43.2	85.5	16.4	47.2	3.0	1.8	41.5	-	25.7	12.6	14.1	-	73.3	40.0
GOA	20.8	-	-	-	-	-	19.3	-	83.3	25.4	-	-	-	100.0	-	-	20.5
GUJARAT(d)	48.5	5.7	11.6	5.6	82.8	90.5	26.7	33.4	8.3	23.2	8.6	98.4	22.7	100.0	38.2	68.4	28.0 *
HARYANA	99.1	47.3	15.4	22.9	97.6	82.0	79.9	21.7	26.4	70.1	-	63.3	63.1	95.9	99.6	-	74.6
HIMACHAL PRADESH	57.6	-	-	6.9	17.3	17.2	17.2	-	2.5	16.5	-	11.1	22.7	33.3	-	-	17.0
JAMMU & KASHMIR	91.2	-	-	5.8	23.7	12.5	39.3	-	14.3	38.1	-	78.0	69.1	-	-	-	40.9
KARNATAKA	61.0	7.5	8.2	74.8	40.9	-	23.5	14.0	4.0	19.4	20.6	-	20.3	99.6	24.3	4.3	22.1
KERALA	40.1	-	-	-	-	-	39.5	-	-	38.0	-	-	11.7	25.0	-	-	12.7
MADHYA PRADESH	20.1	0.1	-	1.0	52.6	23.8	23.8	22.3	11.7	20.4	5.0	35.9	5.9	98.6	24.3	-	18.6
MAHARASHTRA(b)	30.4	6.4	3.3	36.8	52.1	9.1	12.5	21.8	4.5	10.8	13.1	45.2	6.0	100.0	3.3	3.4	11.4 *
MANIPUR	47.8	-	-	-	-	-	46.3	-	-	46.3	-	-	-	-	-	-	41.7
MEGHALAYA(g)	42.8	-	-	-	-	-	35.4	-	-	34.8	-	-	-	-	-	-	19.3 *
MIZORAM(e)	14.0	-	-	-	-	-	13.4	-	-	13.4	-	-	-	-	-	-	10.8 *
NAGALAND	46.5	-	-	-	-	-	35.1	-	-	32.6	-	-	-	-	-	-	28.6
ORISSA	35.6	-	-	7.8	94.1	-	32.9	-	5.4	24.7	18.7	11.7	9.1	79.6	-	33.3	24.1
PUNJAB	99.2	-	83.3	51.1	96.1	83.8	95.5	11.7	49.0	94.3	63.6	88.4	78.7	95.0	99.3	-	94.0
RAJASTHAN	22.5	0.3	1.7	1.8	89.6	82.9	21.7	18.6	9.3	18.1	15.1	66.3	43.6	91.3	94.1	66.7	24.0
SIKKIM(c)	100.0	-	-	-	-	-	22.2	-	-	19.8	-	-	-	-	-	-	10.5 *
TAMIL NADU	90.8	8.5	10.9	66.7	-	-	60.2	-	6.8	48.5	28.5	-	32.2	100.0	32.2	100.0	43.6
TRIPURA(d)	11.9	-	-	-	-	-	11.7	-	12.5	11.7	-	-	-	50.0	-	-	9.2 *
UTTAR PRADESH	43.4	1.3	4.6	31.1	89.5	50.0	61.6	18.2	24.1	56.0	1.3	68.4	46.6	83.9	87.5	100.0	58.0
WEST BENGAL(f)	24.6	-	-	-	72.5	5.6	26.9	2.9	1.7	25.1	-	54.1	44.1	15.4	-	-	22.1 *
ALL-INDIA	45.1	5.2	5.4	19.5	80.1	54.5	40.5	18.9	9.8	34.6	16.6	54.4	20.7	84.1	35.0	45.1	33.3

(a) - Based on the figures for the year 1953-54.
(b) - Based on the figures for the year 1986-87.
(c) - Based on the figures for the year 1984-85
(d) - Based on the figures for the year 1988-89.
(e) - Based on the figures for the year 1974-75.
(f) - Based on the figures for the year 1985-86.
(g) - Based on the figures for the year 1989-90.
(*) - Based on the latest available figures of gross irrigated area and gross sown area.

出典 : Agricultural Statistics at a Grance, 1994, Ministry of Agriculture

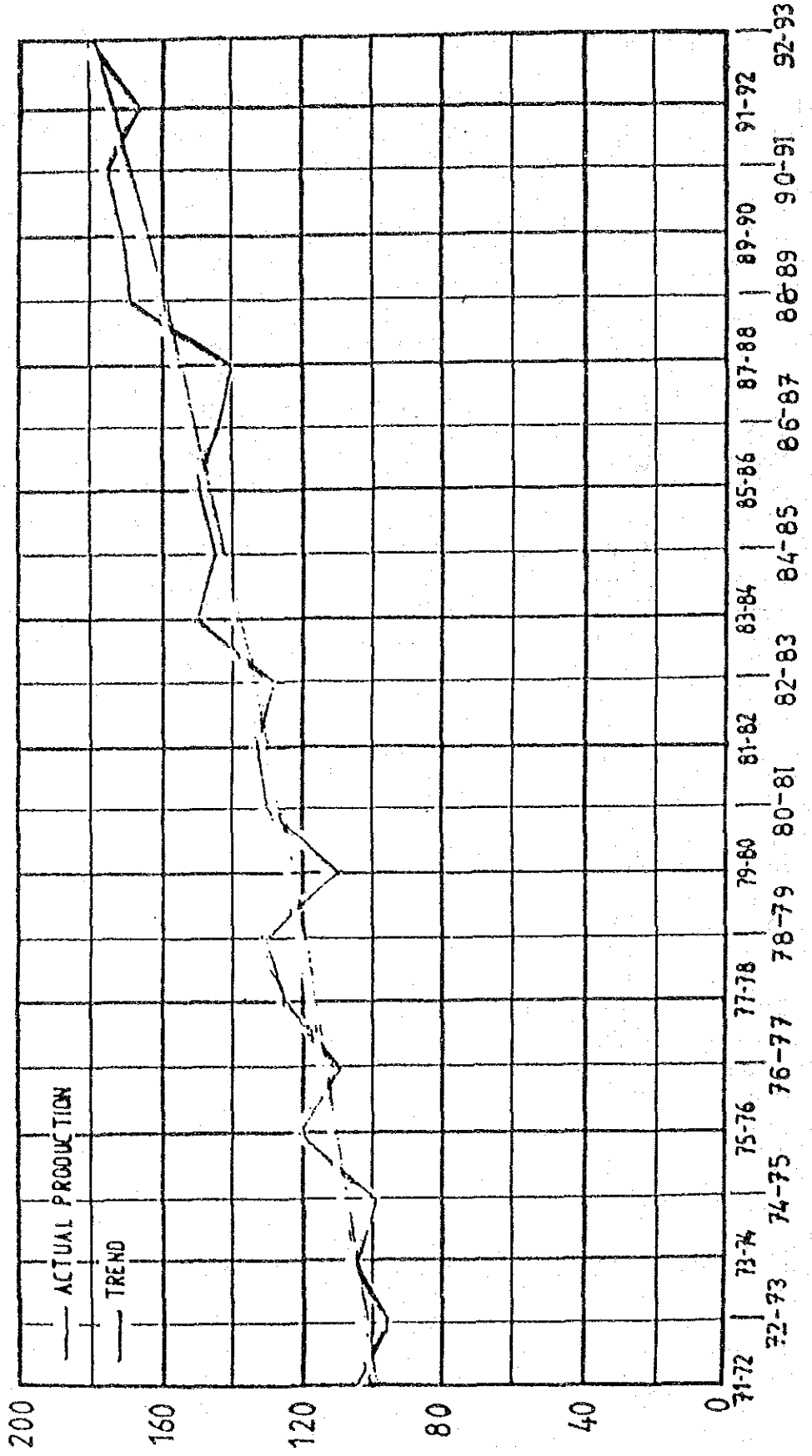
ALL-INDIA AREA, PRODUCTION AND YIELD OF FOODGRAINS

YEAR	AREA (MILLION HECTARES)	PRODUCTION (MILLION TONNES)	YIELD (KGS/HECT)	%COVERAGE UNDER IRRIGATION
1949-50	99.28	54.92	553	17.8
1950-51	97.32	50.82	522	18.1
1951-52	96.96	51.99	536	18.4
1952-53	102.09	59.20	580	18.1
1953-54	109.07	69.82	640	18.1
1954-55	107.86	68.03	631	18.4
1955-56	110.56	66.85	605	18.5
1956-57	111.14	69.86	629	18.2
1957-58	109.48	64.31	587	19.3
1958-59	114.76	77.14	672	18.7
1959-60	115.82	76.67	662	18.8
1960-61	115.58	82.02	710	19.1
1961-62	117.23	82.71	705	19.1
1962-63	117.84	80.15	680	19.8
1963-64	117.42	80.64	687	19.8
1964-65	118.11	89.36	757	20.2
1965-66	115.10	72.35	629	20.9
1966-67	115.30	74.23	644	22.2
1967-68	121.42	95.05	783	21.6
1968-69	120.43	94.01	781	23.6
1969-70	123.57	99.50	805	23.7
1970-71	124.32	108.42	872	24.1
1971-72	122.62	105.17	858	24.5
1972-73	119.28	97.03	813	25.4
1973-74	126.54	104.67	827	24.5
1974-75	121.08	99.83	824	26.5
1975-76	128.18	121.03	944	26.5
1976-77	124.36	111.17	894	27.4
1977-78	127.52	126.41	991	27.7
1978-79	129.01	131.90	1022	28.8
1979-80	125.21	109.70	876	30.3
1980-81	126.67	129.59	1023	29.7
1981-82	129.14	133.30	1032	29.6
1982-83	125.10	129.52	1035	30.8
1983-84	131.16	152.37	1162	30.9
1984-85	126.67	145.54	1149	31.9
1985-86	128.02	150.44	1175	31.4
1986-87	127.20	143.42	1128	32.6
1987-88	119.69	140.35	1173	33.7
1988-89	127.67	169.92	1331	34.4
1989-90	126.77	171.04	1349	34.5
1990-91	127.84	176.39	1380	34.6
1991-92	121.87	168.38	1382	
1992-93	124.58	180.01	1445	

出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

ALL-INDIA PRODUCTION OF FOODGRAINS

MILLION TONNES

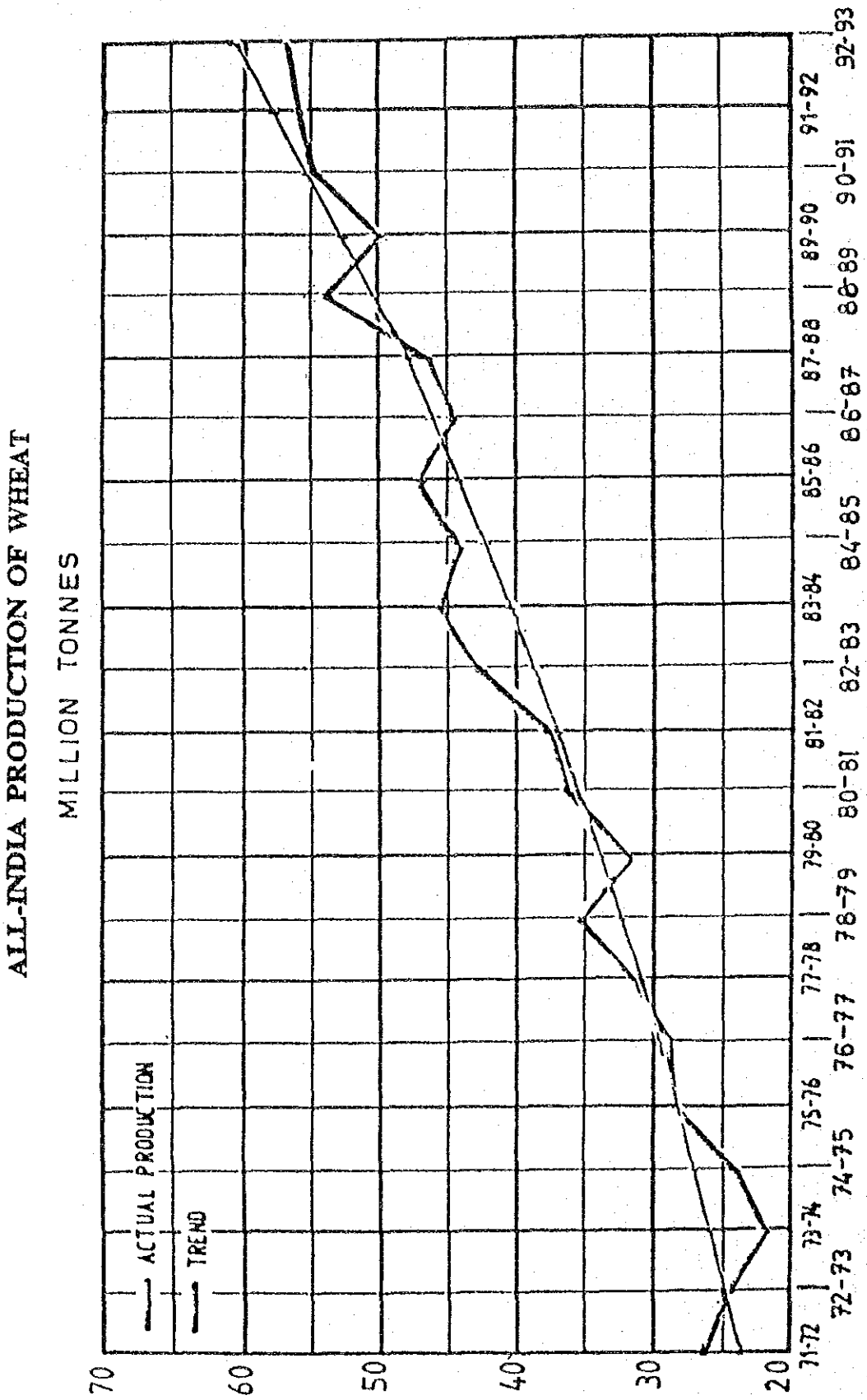


出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

ALL-INDIA AREA, PRODUCTION AND YIELD OF WHEAT

YEAR	AREA (M.HECTS)	PRODUCTION (M.TONNES)	YIELD (KGS/HECT)	% COVERAGE UNDER IRRIGATION
1949-50	9.76	6.39	655	31.5
1950-51	9.75	6.46	663	34.0
1951-52	9.47	6.18	653	35.8
1952-53	9.83	7.50	763	37.2
1953-54	10.68	8.02	750	36.2
1954-55	11.26	9.04	803	35.0
1955-56	12.37	8.76	708	32.7
1956-57	13.52	9.40	695	29.4
1957-58	11.73	7.99	682	33.3
1958-59	12.62	9.96	789	31.8
1959-60	13.38	10.32	772	31.8
1960-61	12.93	11.00	851	32.7
1961-62	13.57	12.07	890	31.9
1962-63	13.59	10.78	793	33.8
1963-64	13.50	9.85	730	34.9
1964-65	13.42	12.26	913	36.8
1965-66	12.57	10.40	827	43.1
1966-67	12.84	11.39	887	48.0
1967-68	14.99	16.54	1103	43.4
1968-69	15.96	18.65	1169	49.8
1969-70	16.63	20.09	1209	51.1
1970-71	18.24	23.83	1307	54.3
1971-72	19.14	26.41	1380	54.5
1972-73	19.46	24.74	1271	57.6
1973-74	18.58	21.78	1172	57.7
1974-75	18.01	24.10	1338	61.8
1975-76	20.45	28.84	1410	61.8
1976-77	20.92	29.01	1387	65.1
1977-78	21.46	31.75	1480	64.6
1978-79	22.64	35.51	1568	66.0
1979-80	22.17	31.83	1436	68.3
1980-81	22.28	36.31	1630	76.5
1981-82	22.14	37.45	1691	70.7
1982-83	23.57	42.79	1816	72.5
1983-84	24.67	45.48	1843	73.0
1984-85	23.56	44.07	1870	74.5
1985-86	23.00	47.05	2046	74.6
1986-87	23.13	44.32	1916	76.3
1987-88	23.06	46.17	2002	76.8
1988-89	24.11	54.11	2244	79.1
1989-90	23.50	49.85	2121	79.5
1990-91	24.17	55.14	2281	80.1
1991-92	23.26	55.69	2394	
1992-93	24.43	56.76	2323	

出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

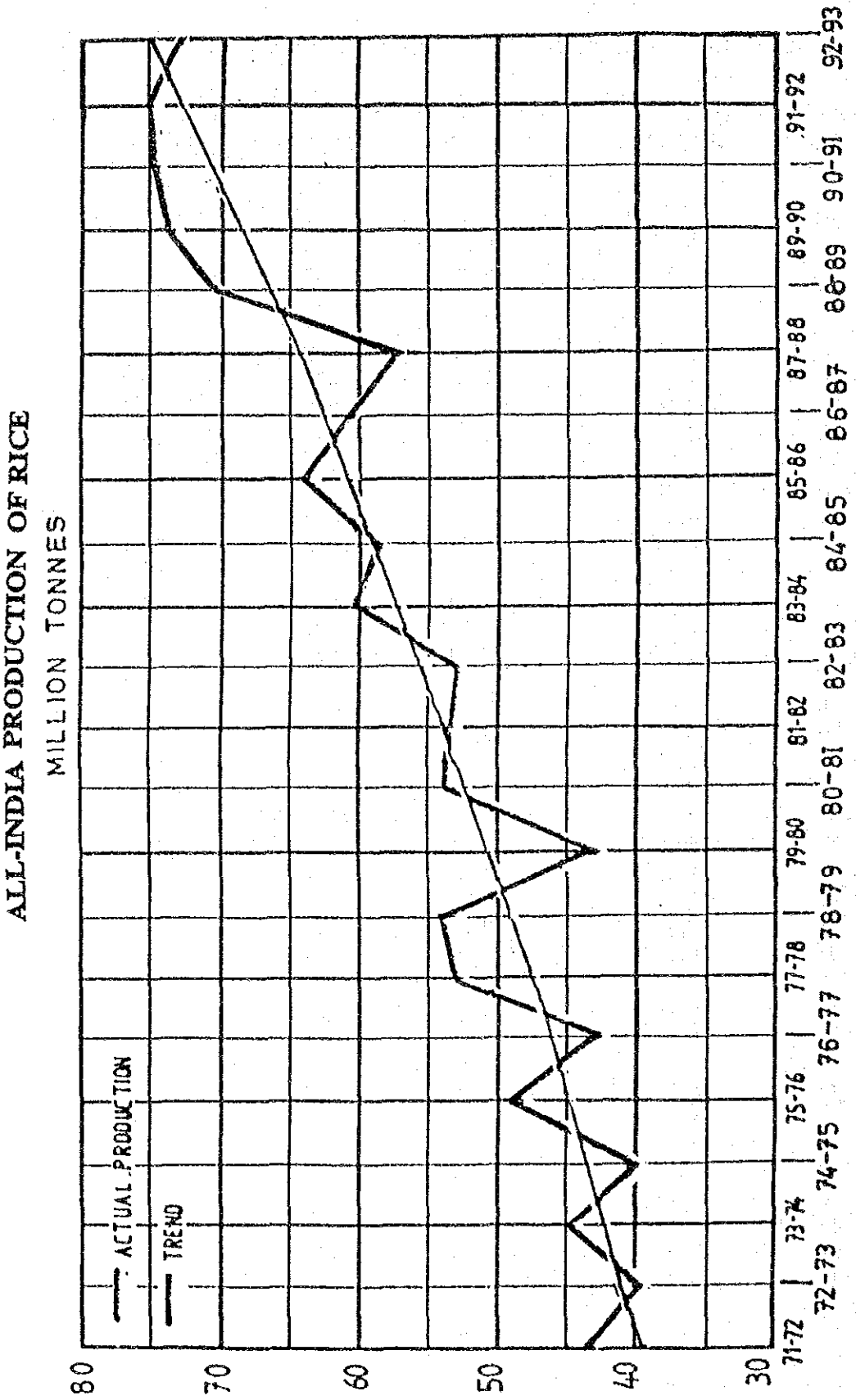


出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

ALL-INDIA AREA, PRODUCTION AND YIELD OF RICE

YEAR	AREA (M.HECTS)	PRODUCTION (M.TONNES)	YIELD (KGS/HECT)	% COVERAGE UNDER IRRIGATION
1949-50	30.52	23.54	771	32.3
1950-51	30.81	20.58	668	31.7
1951-52	29.83	21.30	714	31.7
1952-53	29.97	22.90	764	32.3
1953-54	31.29	28.21	902	33.6
1954-55	30.77	25.22	820	34.4
1955-56	31.52	27.56	874	34.9
1956-57	32.28	29.04	900	35.4
1957-58	32.30	25.53	790	36.4
1958-59	33.17	30.85	930	36.3
1959-60	33.82	31.68	937	35.8
1960-61	34.13	34.58	1013	36.8
1961-62	34.69	35.66	1028	37.5
1962-63	35.69	33.21	931	37.4
1963-64	35.81	37.00	1033	37.1
1964-65	36.46	39.31	1078	37.3
1965-66	35.47	30.59	862	36.5
1966-67	35.25	30.44	863	37.9
1967-68	36.44	37.61	1032	38.6
1968-69	36.97	39.76	1076	38.4
1969-70	37.68	40.43	1073	38.2
1970-71	37.59	42.22	1123	38.4
1971-72	37.76	43.07	1141	37.2
1972-73	36.69	39.24	1070	39.1
1973-74	38.29	44.05	1151	38.4
1974-75	37.89	39.58	1045	38.8
1975-76	39.48	48.74	1235	38.7
1976-77	38.51	41.92	1088	38.4
1977-78	40.28	52.67	1308	40.2
1978-79	40.48	53.77	1328	41.6
1979-80	39.42	42.33	1074	42.8
1980-81	40.15	53.63	1336	40.7
1981-82	40.71	53.25	1308	41.5
1982-83	38.26	47.12	1231	42.0
1983-84	41.24	60.10	1457	42.7
1984-85	41.16	58.34	1417	43.7
1985-86	41.14	63.83	1552	42.9
1986-87	41.17	60.56	1471	44.1
1987-88	38.81	56.86	1465	43.8
1988-89	41.73	70.49	1689	46.0
1989-90	42.17	73.57	1745	45.6
1990-91	42.69	74.29	1740	45.1
1991-92	42.65	74.68	1751	
1992-93	41.64	72.61	1744	

出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

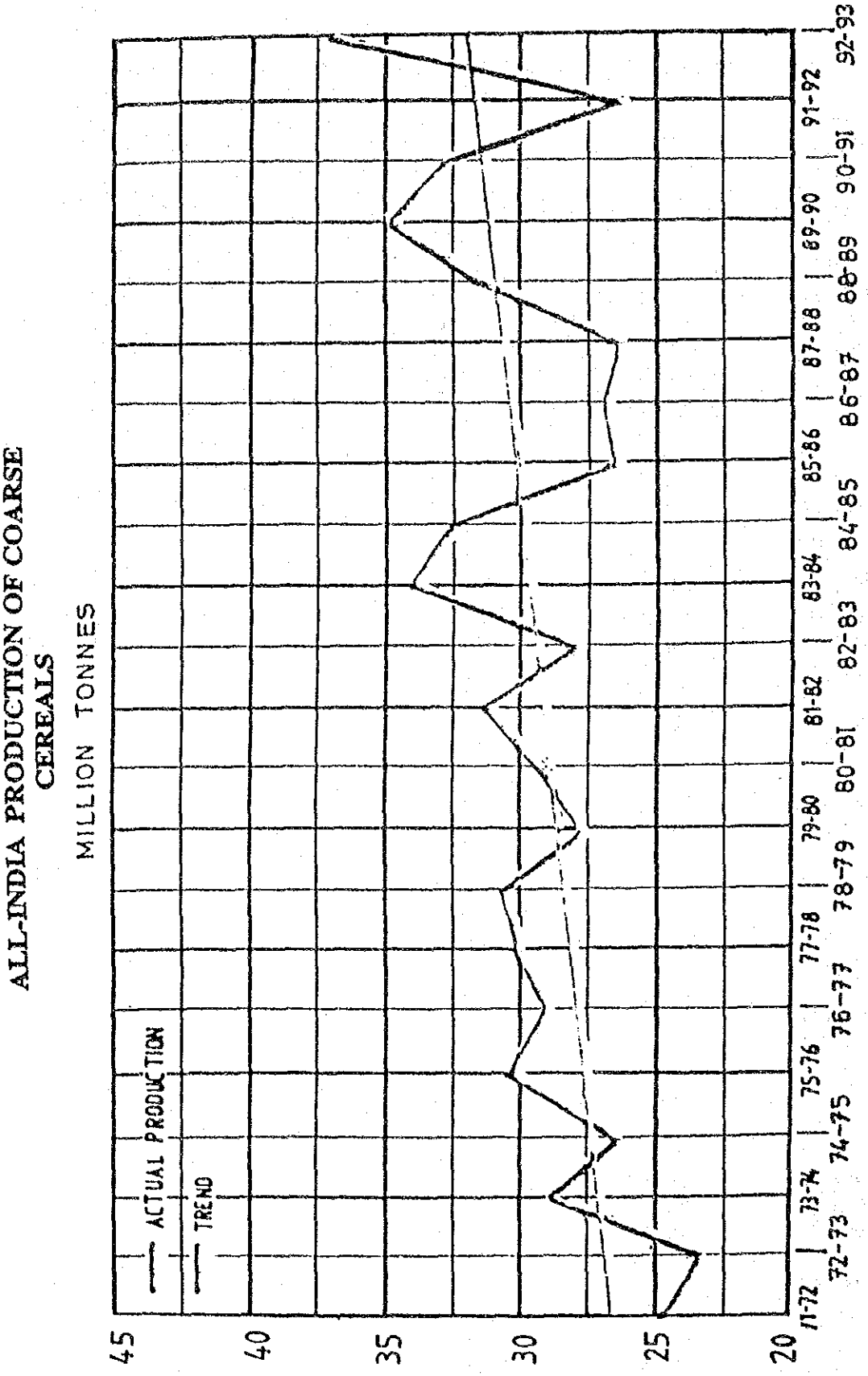


出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

ALL-INDIA AREA, PRODUCTION AND YIELD OF COARSE CEREALS

YEAR	AREA (M.HECTS)	PRODUCTION (M.TONNES)	YIELD (KGS/HECT)	%COVERAGE UNDER IRRIGATION
1949-50	38.83	16.83	433	8.5
1950-51	37.67	15.38	408	7.9
1951-52	38.88	16.09	414	8.7
1952-53	42.45	19.61	462	8.1
1953-54	45.37	22.97	506	7.8
1954-55	43.92	22.82	520	8.1
1955-56	43.45	19.49	449	8.0
1956-57	42.02	19.87	473	7.6
1957-58	42.91	21.23	495	8.0
1958-59	44.66	23.18	519	7.5
1959-60	43.79	22.87	522	7.5
1960-61	44.96	23.74	528	7.7
1961-62	44.73	23.22	519	7.1
1962-63	44.29	24.63	556	7.3
1963-64	43.93	23.72	540	7.3
1964-65	44.35	25.37	514	7.3
1965-66	44.34	21.42	483	8.1
1966-67	45.09	24.05	533	8.5
1967-68	47.34	28.80	608	8.0
1968-69	46.24	25.18	545	9.6
1969-70	47.24	27.29	578	9.4
1970-71	45.95	30.55	665	8.3
1971-72	43.57	24.60	564	8.4
1972-73	42.21	23.14	548	8.6
1973-74	46.24	28.83	623	8.3
1974-75	43.15	26.13	606	10.9
1975-76	43.80	30.41	694	9.9
1976-77	41.94	28.88	689	9.7
1977-78	42.28	30.02	710	8.9
1978-79	42.23	30.44	721	8.5
1979-80	41.36	26.97	652	9.4
1980-81	41.78	29.02	695	9.2
1981-82	42.45	31.09	733	9.0
1982-83	40.43	27.75	685	9.0
1983-84	41.71	33.90	813	7.8
1984-85	39.21	31.17	795	8.4
1985-86	39.47	26.20	664	8.4
1986-87	39.74	26.83	675	9.1
1987-88	36.55	26.36	721	9.9
1988-89	38.68	31.47	814	9.1
1989-90	37.69	34.76	922	9.4
1990-91	36.32	32.70	900	8.9
1991-92	33.42	25.99	778	
1992-93	34.77	37.04	1065	

出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture



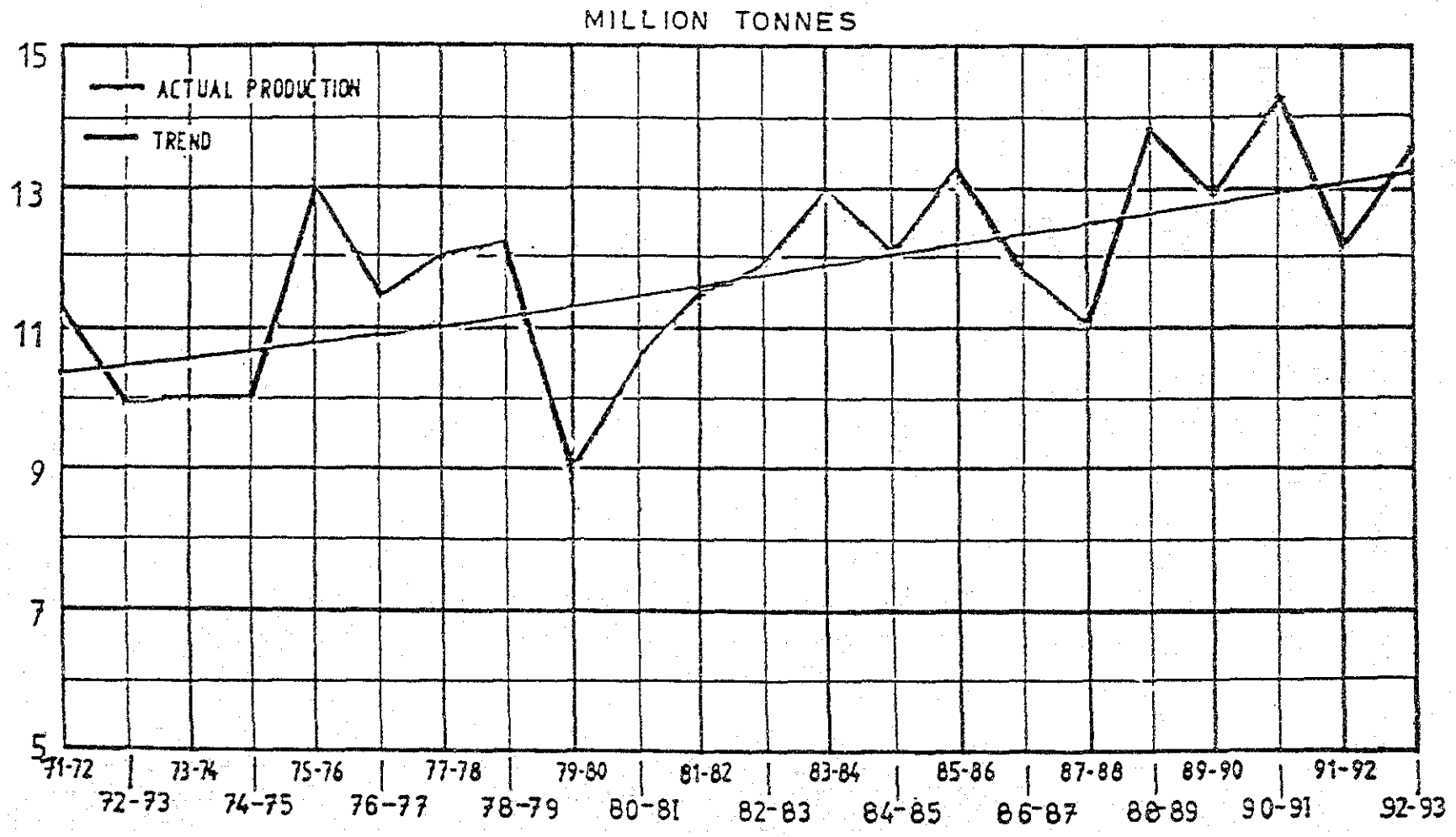
出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

ALL-INDIA AREA, PRODUCTION AND YIELD OF TOTAL PULSES

YEAR	AREA (M.HECTS)	PRODUCTION (M.TONNES)	YIELD (KGS/HECT)	% COVERAGE UNDER IRRIGATION
1949-50	20.17	8.16	405	7.8
1950-51	19.09	8.41	441	9.4
1951-52	18.78	8.42	448	9.7
1952-53	19.84	9.19	463	9.8
1953-54	21.73	10.62	489	9.2
1954-55	21.91	10.95	500	8.8
1955-56	23.22	11.04	476	8.4
1956-57	23.32	11.55	495	7.3
1957-58	22.54	9.56	424	9.1
1958-59	24.31	13.15	541	8.4
1959-60	24.83	11.80	475	8.5
1960-61	23.56	12.70	539	8.0
1961-62	24.24	11.76	485	8.1
1962-63	24.27	11.53	475	8.9
1963-64	24.18	10.07	416	8.9
1964-65	23.88	12.42	520	9.2
1965-66	22.72	9.94	438	9.4
1966-67	22.12	8.35	377	10.9
1967-68	22.65	12.10	534	8.7
1968-69	21.26	10.42	490	9.8
1969-70	22.02	11.69	531	9.4
1970-71	22.54	11.82	524	8.8
1971-72	22.15	11.09	501	8.8
1972-73	20.92	9.91	474	8.1
1973-74	23.43	10.01	427	7.9
1974-75	22.03	10.02	455	8.1
1975-76	24.45	13.04	533	7.9
1976-77	22.98	11.36	494	7.5
1977-78	23.50	11.97	510	7.1
1978-79	23.66	12.18	515	7.9
1979-80	22.26	8.57	385	8.8
1980-81	22.46	10.63	473	9.0
1981-82	23.84	11.51	483	8.5
1982-83	22.83	11.86	519	8.2
1983-84	23.54	12.89	548	7.5
1984-85	22.74	11.96	526	7.9
1985-86	24.42	13.36	547	8.5
1986-87	23.16	11.71	506	9.6
1987-88	21.27	10.96	515	9.4
1988-89	23.15	13.85	598	9.1
1989-90	23.41	12.86	549	9.6
1990-91	24.66	14.26	578	9.8
1991-92	22.54	12.02	533	
1992-93	23.74	13.60	573	

出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

ALL-INDIA PRODUCTION OF TOTAL PULSES



出典：Agricultural Statistics at a Grance, 1994, Ministry of Agriculture

IMPORTS OF FOODGRAINS BY FOOD CORPORATION OF INDIA

(THOUSAND TONNES)

YEAR (JULY-JUNE)	RICE	WHEAT	TOTAL
1980-81	-	48.5 *	48.5
1981-82	78.3	2113.7	2192.0
1982-83	-	1952.1	1952.1
1983-84	465.5 @	3738.8	4204.3
1984-85	380.9	689.5	1070.4
1985-86	10.0 **	-	10.0 **
1986-87	-	-	-
1987-88	-	-	-
1988-89	683.8	2011.0	2694.8
1989-90	532.7	-	532.7
1990-91	44.9 *	-	44.9 *
1991-92	-	-	-
1992-93 (P)	75.0	2380.0	2455.0

* Received in repayment of commodity loan.
** Received from Vietnam in repayment of commodity loan of 1980.
@ Includes a quantity of 1.00 lakh tonnes of rice received from Bangladesh in repayment of rice loan given in 1979.
P Provisional

EXPORT OF FOODGRAINS BY FOOD CORPORATION OF INDIA

(THOUSAND TONNES)

YEAR	RICE	WHEAT & WHEAT PRODUCTS (FLOUR)	TOTAL
1980-81	165.16	57.91	223.07
1981-82	332.95	-	332.95
1982-83	361.43	105.02	466.45
1983-84	-	23.40	23.40
1984-85	-	32.41 *	32.41 *
1985-86	-	336.95 **	336.95
1986-87	-	439.11	439.11
1987-88	-	489.83	489.83
1988-89	-	14.23 @	14.23
1989-90	5.00	12.00	17.00
1990-91	10.00 $	201.00	211.00
1991-92 (P)	53.00	731.00	784.00
1992-93 (P)	26.00	20.00	46.00

* Aid to African countries through World Food Programme.
** Include a quantity of 675.3 thousand tonnes of wheat sent as aid to African countries.
@ Includes a quantity of one thousand tonnes as PM's Gift.
$ Gift to USSR. P: Provisional

出典：Agricultural Statistics at a Grarce, 1994, Ministry of Agriculture

PER CAPITA NET AVAILABILITY OF FOODGRAINS IN INDIA

(GRAMS PER DAY)

YEAR	RICE	WHEAT	OTHER CEREALS	CEREALS	GRAM	PULSES	FOOD-GRAINS
1951	158.9	65.7	109.6	334.2	22.5	60.7	394.9
1961	201.1	79.1	119.5	399.7	30.2	69.0	468.7
1971	192.6	103.6	121.4	417.6	20.0	51.2	468.8
1975	158.9	112.1	94.8	365.8	14.2	39.7	405.5
1976	187.2	79.5	107.1	373.8	20.2	50.5	424.3
1977	168.8	114.5	103.0	386.3	18.4	43.3	429.6
1978	196.2	126.3	100.0	422.5	17.8	45.5	468.0
1979	200.3	132.3	99.2	431.8	18.6	44.7	476.5
1980	166.1	126.8	86.6	379.5	10.7	30.9	410.4
1981(P)	197.8	129.6	89.9	417.3	13.4	37.5	454.8
1982(P)	192.9	127.9	94.8	415.6	14.0	39.2	454.8
1983(P)	169.8	144.4	83.6	397.8	15.6	39.5	437.3
1984(P)	197.8	140.8	99.2	437.8	13.7	41.9	479.7
1985(P)	189.1	138.6	87.9	415.6	12.9	38.4	454.0
1986(P)	212.3	151.2	70.7	434.2	16.2	43.9	478.1
1987(P)	206.3	158.1	71.0	435.4	12.3	36.4	471.8
1988(P)	188.5	154.5	68.8	411.8	9.6	36.7	448.5
1989(P)	215.6	156.7	80.3	452.6	13.4	41.9	494.5
1990(P)	215.3	132.6	87.4	435.3	10.7	41.1	476.4
1991(P)	221.7	166.8	80.0	468.5	13.4	41.6	510.1
1992(P)	214.3	161.4	59.9	435.6	10.2	34.3	469.9
1993(P)*	208.4	131.8	88.8	429.0	10.5	36.6	465.6

(P) - PROVISIONAL　　* :- As on 7-12-1993.

NOTES-FIGURES IN RESPECT OF PER CAPITA AVAILABILITY GIVEN ABOVE ARE NOT STRICTLY REPRESENTATIVE OF THE ACTUAL LEVEL OF CONSUMPTION IN THE COUNTRY, ESPECIALLY AS THEY DO NOT TAKE INTO ACCOUNT ANY CHANGE IN STOCKS IN POSSESSION OF TRADERS, PRODUCERS AND CONSUMERS.

出典 : Agricultural Statistics at a Grance, 1994, Ministry of Agriculture

添付資料－Ｉ

種子公社一覧表

<National Level>

1.National Seeds Corporation(NSC)

2.State Farms Corporation of India(SFCI)

<State Level>

3.Andhra Pradesh State Seeds Development Corporation

4.Bihar State Seed Coeporation

5.Haryana Seeds Developmanr Corporation

6.Karnataka State Seeds Corporation

7.Maharashtra State Seeds Corporation

8.Orissa State Seeds Corporation

9.Punjab State Seeds Corporation

10.Rajastan State Seeds Corporation

11.Uttar Pradesh Seeds & Tarai Development Corporation

12.Madhya Pradesh State Seeds & Farm Development Corporation

13.Assam State Seeds Corporation

14.West Bengal State Seeds Corporation

15.Gujarat State Seeds Corpotation

（出典：Farmer's Seed Guide, 1994, National Seeds Corporation）

添付資料－Ｊ

主要作物育種家種子生産量　　単位：kg

作　物		1989-90	1990-91	1991-92	1992-93	1993-94
コムギ	目標	22,436	13,128	20,556	22,540	22,740
	実績	24,700	22,716	31,920	38,540	24,000
イネ	目標	813	405	353	497	341
	実績	893	1,482	1,175	826	515
トウモロコシ	目標	205	47	114	47	27
	実績	598	253	212	110	29
ソルガム	目標	267	105	71	99	93
	実績	206	141	84	99	133

出典：質問書回答、ＩＡＲＩ種子科学技術課

BREEDER SEED PRODUCTION (ton)

Crop		1988-89	1989-90	1990-91	1991-92	1992-93
Wheat	I	422.1	560.9	338.2	513.9	563.5
	P	644.2	617.5	567.9	798.0	962.6
Paddy	I	69.0	122.0	60.6	53.0	74.4
	P	76.9	134.1	222.3	176.2	123.9
Sorghum	I	25.1	26.7	10.5	7.1	9.9
	P	16.7	20.5	14.1	8.4	9.9
Maize	I	13.8	20.5	4.7	11.4	4.7
	P	10.3	59.8	25.3	21.2	10.9
Barley	I	12.9	11.6	4.5	8.0	2.8
	P	6.7	17.5	3.9	7.4	7.1
P.Miillet	I	6.8	4.1	3.3	3.2	2.9
	P	5.5	4.8	6.5	4.1	3.4
S.Millet	I		1.6	1.7	1.6	0.6
	P		0.2	2.0	1.0	1.8
Pulse Crops	I	303.6	224.9	195.7	246.9	265.0
	P	370.3	284.9	292.9	327.1	269.4
Jute/ Mesta	I	1.3	1.3	1.7	0.8	1.7
	P		0.5	0.5	1.0	1.0
Cotton	I	14.7	34.4	8.3	12.3	18.1
	P	21.2	28.5	44.7	69.7	111.0
Forage Crops	I	14.2	10.6	22.8	28.0	34.2
	P	3.8	33.0	56.9	34.2	30.0
Oilseed	I	825.4	778.7	594.8	834.1	789.3
	P	854.8	810.9	722.5	930.0	768.9
TOTAL	I	1708.9	1797.3	1236.9	1720.5	1787.2
	P	2010.5	2012.3	1959.5	2378.3	2300.1

I = Indent ; P = Production

BREEDER SEED PRODUCTION OF DIFFERENT OILSEED CROPS (ton)

Crop		1988-89	1889-90	1990-91	1991-92	1992-93
Groundnut	I	658.9	570.3	481.3	680.8	568.4
	P	561.5	446.5	505.2	653.7	387.5
Soyabean	I	199.0	189.1	100.1	133.8	189.9
	P	241.1	315.5	178.3	236.8	331.6
Sunflower	I	22.0	8.6	5.7	12.4	19.4
	P	16.3	15.5	7.2	12.7	12.2
Niger	I	0.3	0.2	0.3	0.3	0.2
	P	0.4	0.2	0.2		0.2
Castor	I	3.4	5.8	2.2	1.4	2.5
	P	10.7	14.0	10.5	5.5	3.2
Sesamum	I	1.3	0.7	0.6	0.3	0.2
	P	3.6	3.5	1.1	1.2	0.5
Rapeseed/	I	3.6	1.5	1.5	1.5	1.7
Mustard	P	11.0	10.6	13.3	12.7	6.5
Linseed	I	2.1	1.9	1.6	2.3	3.0
	P	6.0	3.3	5.0	3.5	3.1
Safflower	I	4.6	0.5	1.5	1.3	4.1
	P	4.0	1.3	1.7	3.7	4.2
TOTAL	I	895.4	878.7	594.7	834.1	789.3
	P	854.8	810.9	722.5	930.0	769.9

I = Indent, P = Production

出典：質問表回答　ＩＡＲＩ種子科学技術課

AVAILABILITY OF CERTIFIED/QUALITY SEEDS
(ton)

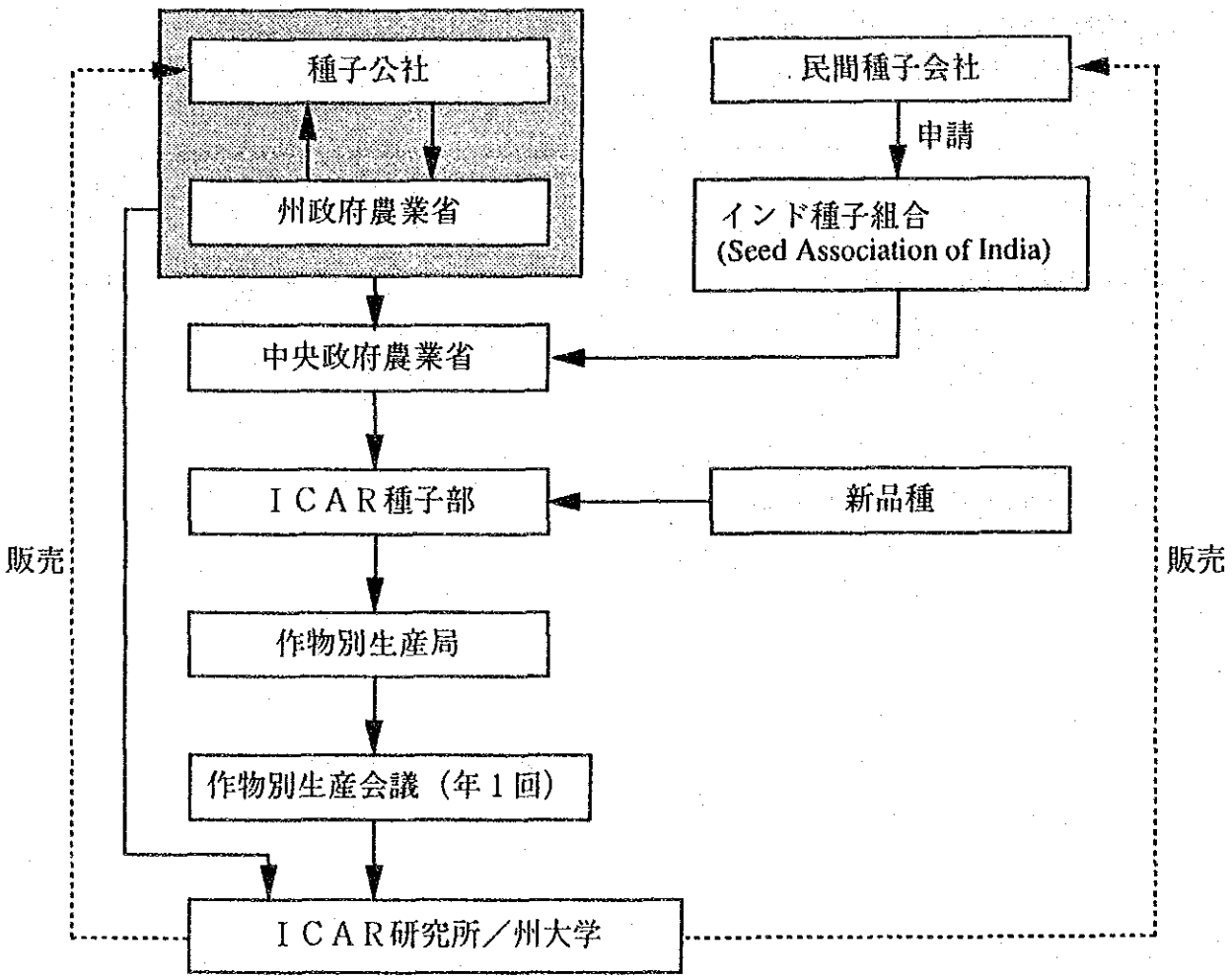
	1990-91	1991-92	1992-93	1993-94
CEREALS				
Wheat	136200	136200	176100	205200
Paddy	164900	157700	172100	192000
Maize	18900	17100	16000	16800
Jowar	40300	39800	38800	47600
Pearl millet	22400	15700	18400	20800
Others	2400	2100	2500	3000
Total	385100	368600	423900	485400
PULSES				
Gram	17200	16400	16500	11200
Lentil	1000	1100	1400	1200
Peas	4300	3800	2500	2500
Moong	6100	6300	8100	8800
Pigeon Pea	5500	5600	5300	6500
Others	1700	1500	1900	1600
Total	43100	41100	44700	44200
OIL SEEDS				
Groundnut	63300	69200	82500	73900
Rape/Mustard	7300	6300	9700	8900
Sesamum	800	900	1000	1500
Sunflower	4000	5200	9800	8700
Soyabean	13900	12700	19500	30200
Linseed	400	200	100	100
Castor	2200	7300	2800	2500
Safflower	1300	1200	1300	2400
Others	100	100	200	100
Total	93300	103100	126900	128100

Contd...2/-

	1990-91	1991-92	1992-93	1993-94
FIBER CROPS				
Cotton	19900	21200	22400	21700
Jute/Mesta	2100	2900	2700	2400
Total	22000	24100	25100	24100
Potato	59500	33300	34300	30200
Others	3000	3100	3400	4900
GRAND TOTAL	605800	573100	658300	716900

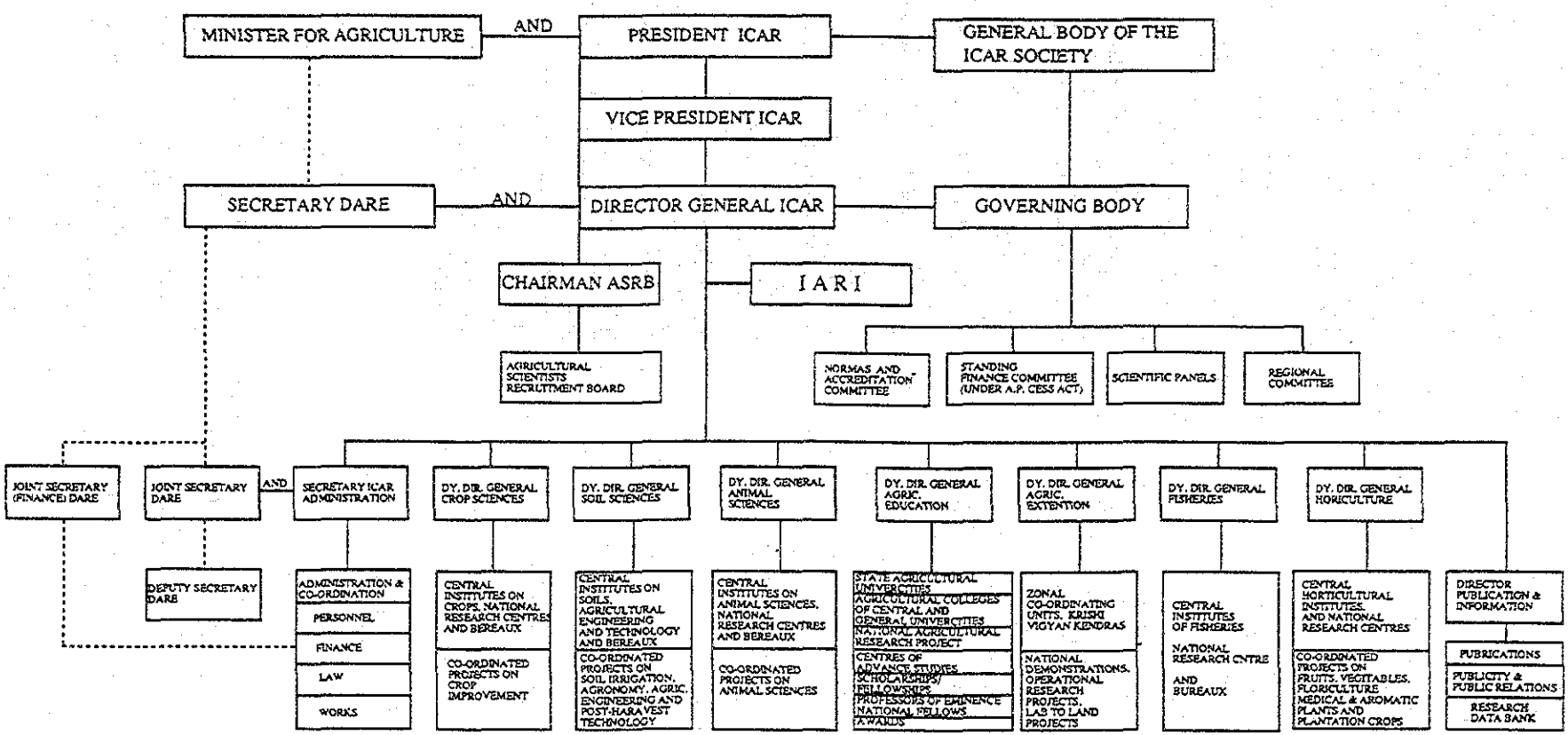
出典：質問表回答　ＩＡＲＩ種子科学技術課

Breeder Seed 生産計画立案プロセジュアー



注：　種子公社／民間種子会社は計画時に申請した量の種子を引き取る義務があるが、毎年約１５％はキャンセルされている。キャンセルに対する罰則は特にない。キャンセルは、要求された品種別の種子量と実際に生産される種子量とに差が生じることが最大の理由となっている。

ORGANISATION OF DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION AND INDIAN COUNCIL OF AGRICULTURAL RESEARCH



ICAR Institute

1. Indian Agricultural Research Institute
   New Delhi ○△×
2. Central Rice Research Institute
   Cuttack ○△×
3. Central Research Institute for Jute and Allied Fibres
   Barrackpore ○△×
4. Central Tobacco Research Institute
   Rajahmundri ○△×
5. Indian Grassland and Fodder Research Institute
   Jhansi ○△×
6. Indian Institute of Sugarcane Research
   Lucknow
7. Sugarcane Breeding Institute
   Coimbatore ○△×
8. Central Institute for Cotton Research
   Nagpur ○△×
9. Vivekananda Parvatiya Krishi Anusandhan Shala
   Almora ○△×
10. Central Potato Research Institute
    Shimla ○△×
11. Central Tuber Crops Research Institute
    Trivandrum
12. Indian Institute of Horticultural Research
    Bangalore ○△×
13. Central Plantation Crops Research Institute
    Kasaragod ○△×
14. Central Institute of Horticulture for Northern Plains
    Lucknow
15. ICAR Research Complex for Goa
    Goa
16. ICAR Research Complex for North-Eastern Hills Region
    Barapani
17. Central Arid Zone Research Institute
    Jodhpur ○△×
18. Central Soil and Water Conservation Research and Training Institute
    Dehra Dun
19. Central Soil Salinity Research Institute
    Karnal ○△×
20. Central Agricultural Search Institute for Andaman and Nicobar Groups of Islands
    Port Blair
21. Central Research Institute for Dryland Agriculture
    Hyderabad
22. Indian Insitute of Soil Science
    Bhopal
23. National Dairy Research Institute
    Karnal
24. Indian Veterinary Research Institute
    Izatnagar
25. Central Sheep and Wool Research Institute
    Avikanagar
26. Central Institute for Research on Goats
    Makhdoom
27. Central Avian Research Institute
    Izatnagar
28. Central Institute for Research on Buffaloes
    Hisar
29. National Institute of Animal Genetics
    Karnal
30. Central Inland Capture Fisheries Research Institute
    Barrackpore
31. Central Marine Fisheries Research Institute
    Cochin
32. Central Institute of Fisheries Technology
    Cochin
33. Central Institute of Fisheries Education.
    Bombay
34. Central Institute of Brackishwater Aquaculture
    Madras
35. Central Institute of Freshwater Aquaculture
    Kausalyaganga
36. Indian Agricultural Statistic Research Institute
    New Delhi
37. Indian Lac Research Institute
    Ranchi
38. Jute Technological Research Laboratories
    Calcutta
39. Central Institute for Research on Cotton Technology
    Bolbay
40. Central Institute of Agricultural Engineering
    Bhopal
41. Central Institute of Post-Harvest Engineering and Technology
    Ludhiana
42. National Academy of Agricultural Research and Management
    Hyderabad

National Bureau

1. National Bureau of Plant Genetic Resources
   New Delhi ●
2. National Bureau of Soil Survey and Land-Use Planning
   Nagpur
3. National Bureau of Animal Genetic Resources
   Karnal
4. National Bureau of Fish Genetic Resources
   Allahabad

National Research Centre

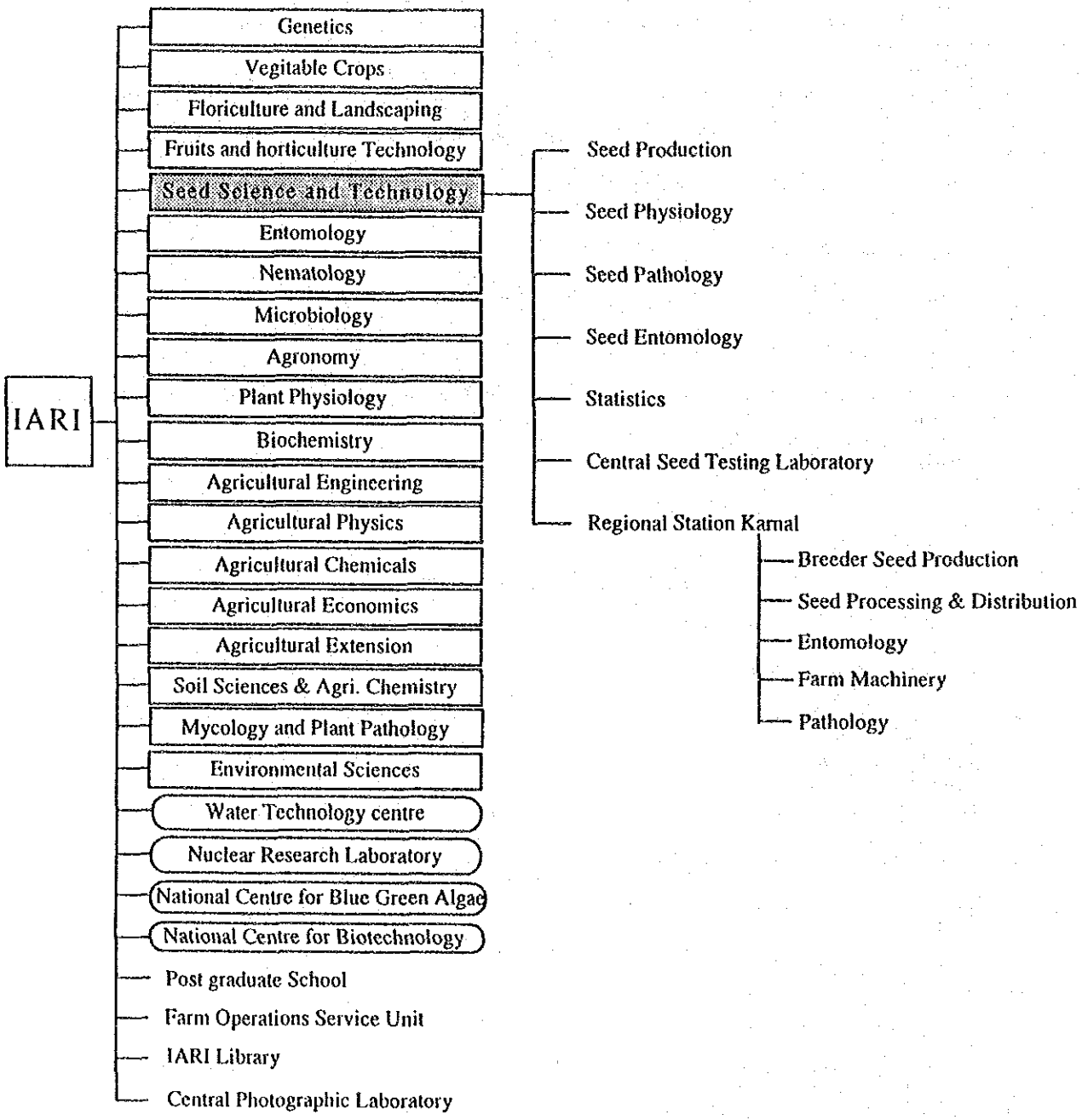
1. National Research Centre for Groundnut
   Junagadh ○△×
2. National Research Centre on Soybean
   Indore ○△×
3. National Research Centre for Integrated Pest Management
   Faridabad
4. National Biotechnological Centre for Crop Sciences
   New Delhi
5. National Research Centre for Sorghum
   Hyderabad ○△×
6. National Research Centre for Mushroom Research and Training
   Solan
7. National Research Centre for Citrus
   Nagpur
8. National Research Centre for Spices
   Calicut
9. National Research Centre for Cashew
   Puttur
10. National Research Centre for Mithum
    Shillong
11. National Research Centre for Yak
    Dirang
12. National Research Centre for Equines
    Hisar
13. National Biotechnology Centre on Animal Health
    Izatnagar
15. National Research Centre for Meat and Meat Products Technology
    Izatnagar
16. National Biotechnology Centre on Animal Production
    Karnal
17. National Research Centre for Cold Water Fisheries
    Haldwani
18. National Research Centre for Agroforestry
    Jhansi
19. National Research Centre for Weed Science
    Jabalpur
20. Water Technology Centre for Eastern Region
    Bhubaneshwar
21. National Centre for Agricultural Economics and Policy Research
    New Delhi
22. National Research Centre for Arid Horticulture
    Hisar

State Agricultural Universities

1. Andhra Pradesh Agricultural University
   Hyderabad ○△×
2. Assam Agricultural University
   Jorhat ○△×
3. Rajendra Agricultural University
   Samastipur ○△×
4. Birsa Agricultural University
   Ranchi ○△×
5. Haryana Agricultural University
   Hisar ○△×☆
6. Himachal Pradesh Krishi Vishwa Vidyalaya
   Palampur ○△×
7. Dr. Yaswant Singh Parmar University of Horticulture and Forestry
   Solan ○△×
8. University of Agricultural Sciences
   Bangalore ○△×
9. University of Agricultural Sciences
   Dharwad ○△×
10. Gujarat Agricultural University
    Dantiwada ○△×
11. Jawaharlal Nehru Krishi Vishwa Vidyalaya
    Jabalpur ○△×
12. Indira Gandhi Krishi Vishwa Vidyalaya
    Raipur ○△×
13. Kerala Agricultural University
    Trichur ○△×
14. Konkan Krishi Vidyalaya
    Ratnagiri ○△×
15. Mahatma Phule Krishi Vidyapeeth
    Rahuri ○△×☆
16. Marathwada Agricultural University
    Parbhani ○△×
17. Punjabrao Krishi Vidyapeeth
    Akola ○△×☆
18. Orissa University of Agriculture and Technology
    Bhubaneshwar ○△×
19. Punjab Agricultural University
    Ludhiana ○△×☆
20. Rajasthan Agricultural University
    Bikaner ○△×☆
21. Tamil Nadu Agricultural University
    Coimbatore ○△×
22. Tamil Nadu Veterinary and Animal Science University
    Madras
23. Chandra Shekhar Azad University of Agriculture and Technology
    Kanpur ○△×☆
24. Govind Ballabh Pant University of Agriculture and Technology
    Pantnagar ○△×☆
25. Narendra Deva University of Agriculture and Technology
    Faizbad ○△×☆
26. Bidhan Chandra Krishi Vishwa Vidyalaya
    Mohanpur ○△×
27. Sher-E-Kashmir University of Agricultural Sciences and Technology
    Srinagar ○△×

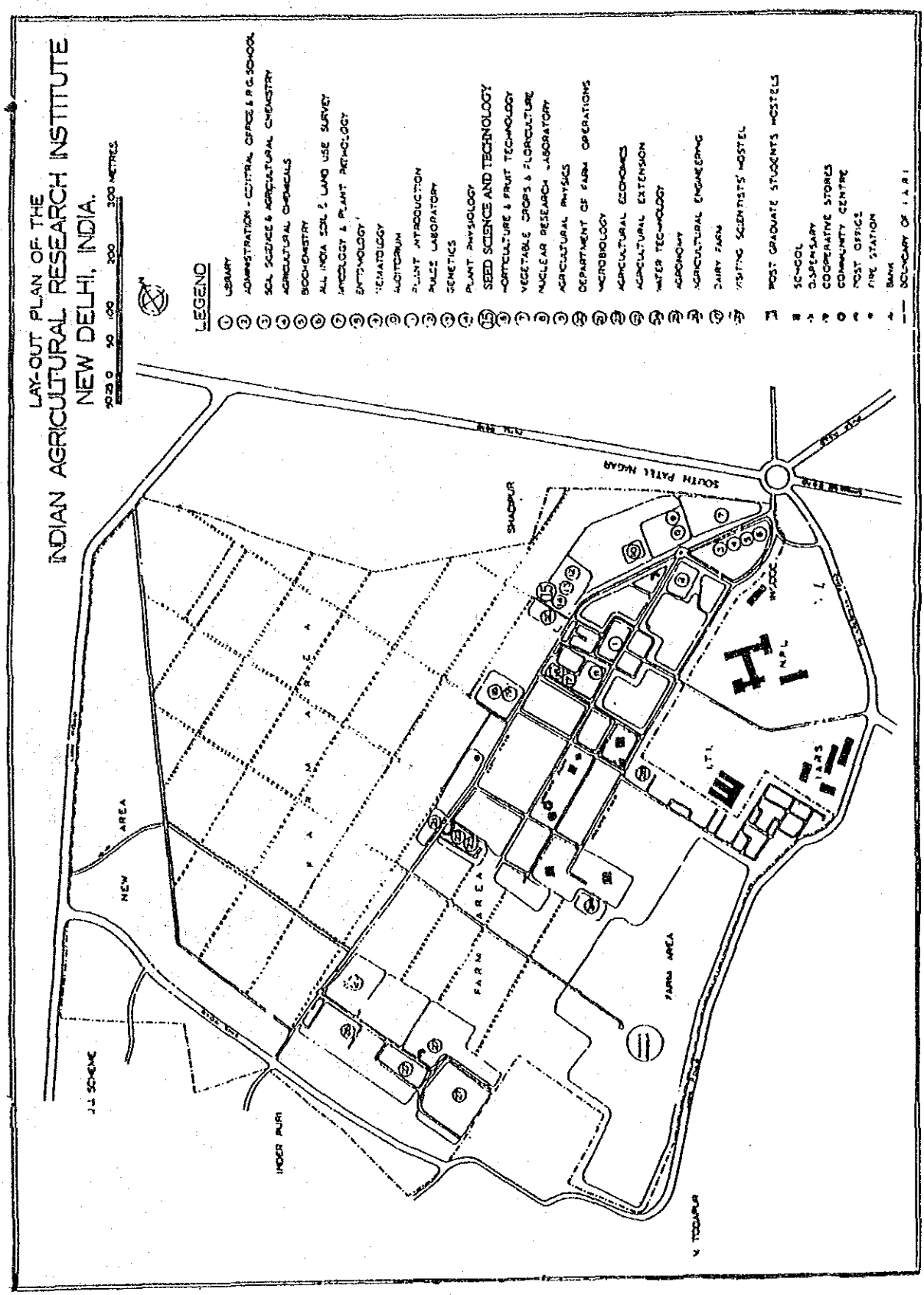
注　：○育種　◎生殖質保存　△育種家種子生産　×原原種生産　☆原種生産
出典：質問表回答　ＩＡＲＩ種子科学技術課

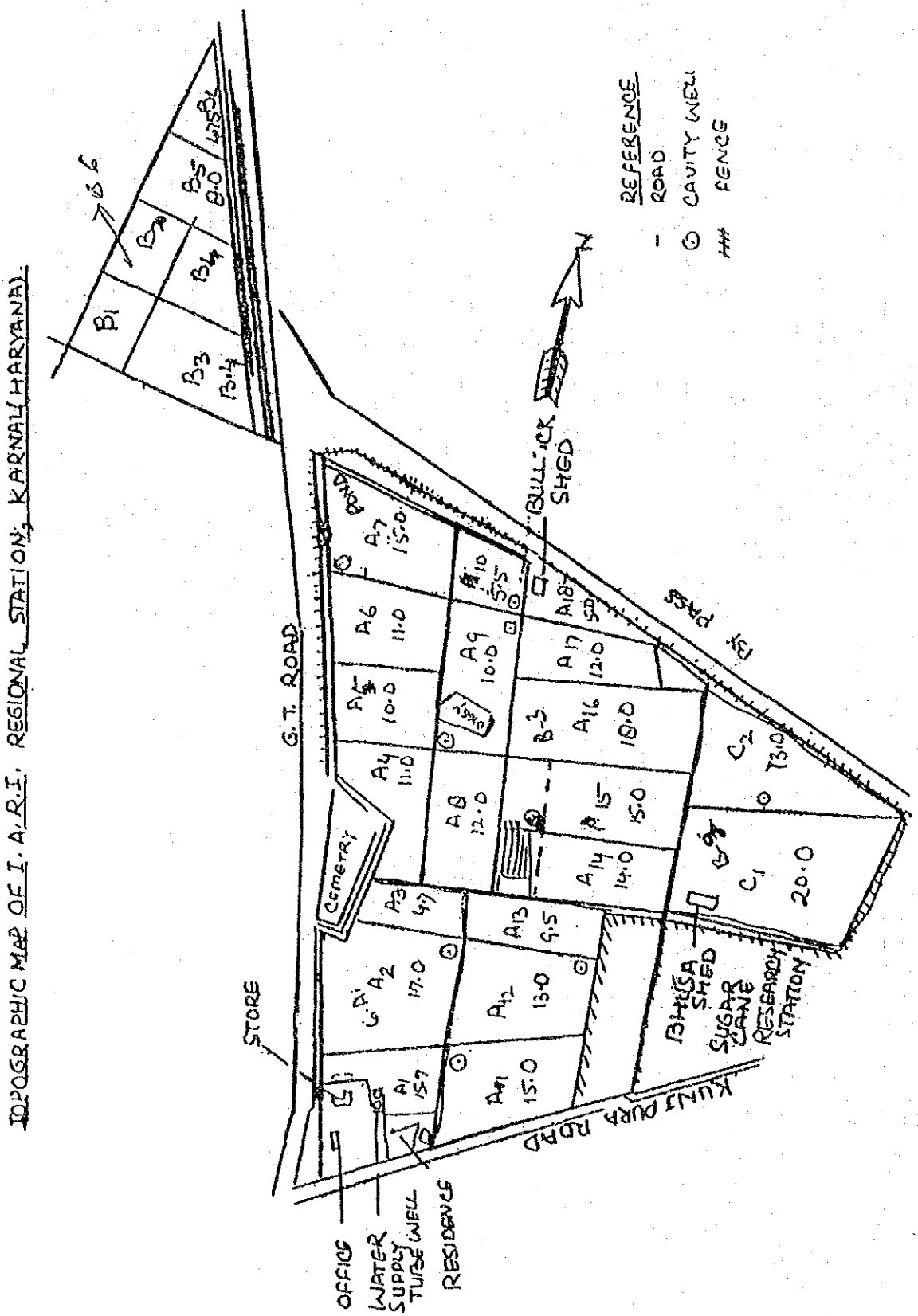
インド農業研究所 (INDIAN AGRICULTURAL RESEARCH INSTITUTE: IARI) 組織図

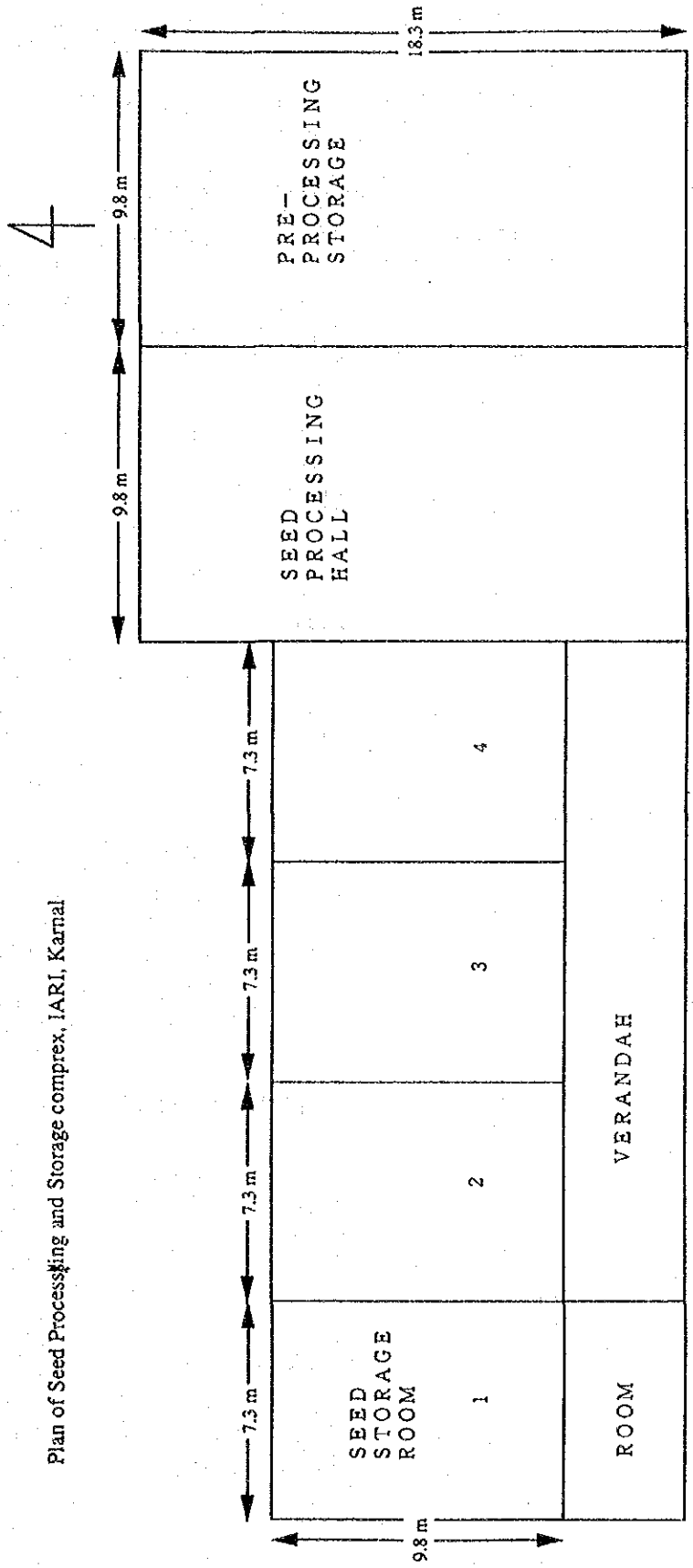


Remarks: Division

Project Director


LAY-OUT PLAN OF THE
INDIAN AGRICULTURAL RESEARCH INSTITUTE
NEW DELHI, INDIA.
LEGEND
LIBRARY
ADMINISTRATION - CENTRAL OFFICE & P.G. SCHOOL
SOIL SCIENCE & AGRICULTURAL CHEMISTRY
AGRICULTURAL CHEMICALS
BIOCHEMISTRY
ALL INDIA SOIL & LAND USE SURVEY
MICROLOGY & PLANT PATHOLOGY
ENTOMOLOGY
NEMATOLOGY
AUDITORIUM
PLANT INTRODUCTION
PULSE LABORATORY
GENETICS
PLANT PHYSIOLOGY
SEED SCIENCE AND TECHNOLOGY
HORTICULTURE & FRUIT TECHNOLOGY
VEGETABLE CROPS & FLORICULTURE
NUCLEAR RESEARCH LABORATORY
AGRICULTURAL PHYSICS
DEPARTMENT OF FARM OPERATIONS
MICROBIOLOGY
AGRICULTURAL ECONOMICS
AGRICULTURAL EXTENSION
WATER TECHNOLOGY
AGRONOMY
AGRICULTURAL ENGINEERING
DAIRY FARM
VISITING SCIENTISTS' HOSTEL
POST GRADUATE STUDENTS HOSTELS
SCHOOL
DISPENSARY
COOPERATIVE STORES
COMMUNITY CENTRE
POST OFFICE
FIRE STATION
BANK
BOUNDARY OF I.A.R.I.
SOUTH PATEL NAGAR
SHADIPUR
NEW AREA
J.J. SCHEME
INDER PURI
FARM AREA
FARM AREA
NPL
WADC
I.T.I.
I.A.R.S.
TODAPUR


TOPOGRAPHIC MAP OF I.A.R.I. REGIONAL STATION, KARNAL (HARYANA).
REFERENCE
ROAD
CAVITY WELL
FENCE
N
G.T. ROAD
PASS
BULLOCK SHED
POND
CEMETERY
STORE
OFFICE
WATER SUPPLY TUBE WELL
RESIDENCE
KUNJPURA ROAD
BHUSA SHED
SUGAR CANE RESEARCH STATION
B1
B3 13.4
B5 8.0
A1 15.7
A2 17.0
A3 4.7
A4 11.0
A5 10.0
A6 11.0
A7 15.0
A8 12.0
A9 10.0
A10 5.5
A11 15.0
A12 13.0
A13 9.5
A14 14.0
A15 15.0
A16 10.0
A17 12.0
A18 5.0
C1 20.0
C2 13.0



Plan of Seed Processing and Storage comprex, IARI, Karnal

SEED PRODUCTION OF FIELD CROPS (CEREALS AND FODDERS) DURING 1993

Crop	Variety	Seed production (q)			
		Nucleus	Breeder	IARI	Total
Wheat	HD 2329	6.55	208.50	14.50	229.55
	HD 2285	5.34	210.00	16.00	231.34
	HD 2189	6.25	156.85	-	163.10
	HD 2428	0.75	25.00	33.30	59.05
	HD 2009	0.82	-	25.80	26.62
	Kundan	6.77	158.50	32.25	197.52
	HD 2204	-	8.74	-	8.74
	HD 2236	-	15.85	-	15.85
	HD 2270	-	12.00	-	12.00
	HD 2307	-	1.00	-	1.00
	HD 2380	-	22.50	10.50	33.00
	HD 2402	-	5.00	1.75	6.75
	HD 2501	-	1.00	-	1.00
	HS 207	-	5.00	-	5.00
	HS 240	-	15.00	-	15.00
	HS 277	-	6.25	-	6.25
	HS 295	-	4.85	-	4.85
	HDR 77	-	33.85	-	33.85
	HI 977	-	32.45	-	32.45
	DL 784-3	-	-	10.60	10.60
		26.48	922.34	144.70	1093.52
Paddy	Pusa-33	-	-	41.70	41.70
	Pusa-2-21	-	-	4.60	4.60
	Pusa 169	-	2.10	25.70	27.80
	Pusa Basmati-I	-	16.00	21.30	37.30
	PNR-381	-	-	4.60	4.60
	PNR-519	-	-	7.70	7.70
	PNR-550	-	-	3.30	3.30
	PNR-555-5	-	-	2.20	2.20
		-	18.10	111.10	129.20
Maize	Kisan	-	0.50	0.27	0.77
	Diara-3	-	0.16	-	0.16
	PC-II	-	0.35	0.53	0.88
		-	1.01	0.80	1.81
Bajra	D-23	-	1.25	-	1.25
	Pusa-444 (Hyb.)	-	-	0.54	0.54
		-	1.25	0.54	1.79
Forage Sorghum	PC-6	0.22	3.38	-	3.60
	PC-9	0.47	8.00	17.40	25.87
	PC-23	0.39	16.15	-	16.54
		1.08	27.53	17.40	46.01
	Grand total	27.56	970.23	274.54	1272.33

SEED PRODUCTION FOR PULSE AND OILSEED CROPS DURING 1993

Crop	Variety	Seed production (q)			
		Nucleus	Breeder	IARI	Total
Mustard	Pusa Bold	0.06	4.40	1.85	6.31
	Pusa Bahar	0.06	0.70	3.45	4.21
	Pusa Barani	-	-	15.20	15.20
	Pusa Jaikisan (Bio-902)	-	-	0.93	0.93
		0.12	5.10	21.43	26.65
Gram	Pusa 209	-	12.00	-	12.00
	Pusa 212	-	10.70	-	10.70
	Pusa 240	-	14.00	-	14.00
	Pusa 256	-	45.00	20.65	65.65
	Pusa 261	-	2.80	-	2.80
	Pusa 267	0.95	6.50	20.50	27.95
	Pusa 372	-	7.24	-	7.24
		0.95	98.24	41.15	140.34
Field pea	DMR-11	-	3.20	1.00	4.20
Lentil	L-4076	-	1.00	3.25	4.25
	L-830	-	-	1.28	1.28
		-	1.00	4.53	5.53
Mung	PS-16	-	1.55	-	1.55
	P-105	-	6.90	-	6.90
		-	8.45	-	8.45
Pigeonpea	P-33	-	2.70	2.42	5.12
	P-84	-	-	8.80	8.80
	P-855	-	2.50	-	6.05
		-	5.20	11.22	16.42
Soyabean	P-16	-	-	1.40	1.40
	P-20	-	-	1.15	1.15
		-	-	2.55	2.55
Cowpea	C-152	-	4.94	-	4.94
	V-240	-	5.68	-	5.68
	V-130	-	7.80	-	7.80
		-	18.42	-	18.42
	Grand total	1.07	139.61	81.88	222.56

SEED PRODUCTION OF VEGETABLE CROPS DURING 1993

Crop	Variety	Quantity of seed (kg)			
		Nucleus	Breeder	IARI	Total
Bhindi	P. Sawani	-	375.000	27.000	402.000
Bittergourd	PDM	-	0.500	0.300	0.800
Bottlegourd	P S P L	-	37.800	-	37.800
Brinjal	P. Kranti	-	2.825	-	2.825
	P P L	-	3.850	-	3.850
	Hy:6 ♀ Parent	-	-	-	2.400*
Cowpea	P. Komal	-	247.700	-	247.700
Carrot	P. Kesar	-	55.000	27.000	82.000
Cauliflower	P. Deepali	-	3.700	3.000	6.700
	Imp. Japanese	-	5.000	1.950	6.950
	P. Synthetic	-	5.000	2.050	7.050
	P.E. Synthetic	-	0.430	-	0.430
Chillies	P.Sadabahar	-	10.225	1.100	11.325
Dolichos	P E P	-	34.000	-	34.000
Methi	P E B	-	50.000	14.000	64.000
	P. Kasuri	-	40.000	25.000	65.000
Muskmelon	P. Sarbati	-	4.100	-	4.100
	P. Madhuras	-	-	6.000	6.000
Onion	P. Red	-	12.100	-	12.100
Pumpkin	P. Viswas	-	-	3.250	3.250
Palak	All Green	-	180.000	25.000	205.000
Pea	Arkel	192.000	2275.000	200.000	2667.00
	Bonnevilla	30.000	400.000	30.000	460.000
Radish	P. Chetki	-	35.700	-	35.700
	P. Rashmi	-	39.200	-	39.200
	P. Desi	-	-	2.600	2.600
Ridegourd	P. Nasdhar	-	-	12.900	12.900
Spongegourd	P. Chikni	-	5.000	5.250	10.250
Tomato	P. Ruby	-	33.000	2.000	35.000
	P E D	-	20.000	1.000	21.000
Turnip	P. Sweti	-	-	5.000	5.000
Watermelon	Sugar baby	0.800	20.200	-	21.000
	Grand total	222.800	3895.330	394.400	4514.93*

出典：Annual Report 1993, IARI Karnal Regional Station

種子貯蔵量〈カルナル農場〉(1991-92)

単位:100Kg

No.	作　物	期首在庫	入庫量	総在庫量	出庫量	繰越し在庫
1	ｺﾑｷﾞ	144.86	1,040.06	1,184.92	1,045.64	139.28
2	ﾄｳｼﾞﾝﾋﾞｴ(Bajra)	9.53	16.68	26.21	13.86	12.35
3	ﾄｳﾓﾛｺｼ	9.77	10.20	19.97	6.84	13.13
4	ｶﾗｼﾅ	7.40	35.20	42.60	34.07	8.53
5	ｲﾈ	85.67	275.47	361.14	184.34	176.80
6	ｿﾙｶﾞﾑ	20.45	39.60	60.05	28.24	31.81
7	ｷﾏﾒ(Arhar)	22.95	39.05	62.00	38.90	23.10
8	ｻｻｹﾞ(Cowpea)	32.18	41.71	73.89	7.40	66.49
9	ﾋｮｺﾏﾒ(Gram)	33.14	86.50	119.64	39.64	80.00
10	ﾋﾗﾏﾒ(Lentil)	6.55	5.29	11.84	10.66	1.18
11	ﾘｮｸﾄｳ(Moong)	30.89	56.67	87.56	55.30	32.26
12	ｴﾝﾄﾞｳ(Matar)	18.22	88.85	107.07	80.42	26.65
13	ﾀﾞｲｽﾞ	1.19		1.19		1.19
	合　計	422.80	1,735.28	2,158.08	1,545.31	612.77

種子貯蔵量〈カルナル農場〉(1992-93)

単位:100Kg

No.	作　物	期首在庫	入庫量	総在庫量	出庫量	繰越し在庫
1	ｺﾑｷﾞ	139.28	1,539.93	1,679.21	1,537.15	142.06
2	ﾄｳｼﾞﾝﾋﾞｴ(Bajra)	12.35	3.37	15.72	6.24	9.48
3	ﾄｳﾓﾛｺｼ	13.13	1.97	15.10	1.33	13.77
4	ｶﾗｼﾅ	8.53	45.70	54.23	42.70	11.53
5	ｲﾈ	176.80	281.40	458.20	181.87	276.33
6	ｿﾙｶﾞﾑ	31.81	73.16	104.97	48.40	56.57
7	ｷﾏﾒ(Arhar)	23.10	23.10	46.20	29.15	17.05
8	ｻｻｹﾞ(Cowpea)	66.49	21.72	88.21	42.81	45.40
9	ﾋｮｺﾏﾒ(Gram)	80.00	105.78	185.78	101.98	83.80
10	ﾋﾗﾏﾒ(Lentil)	1.18	14.88	16.06	10.40	5.66
11	ﾘｮｸﾄｳ(Moong)	32.26	17.44	49.70	19.26	30.44
12	ｴﾝﾄﾞｳ(Matar)	26.65	69.07	95.72	72.85	22.87
13	ﾀﾞｲｽﾞ	1.19	8.12	9.31	1.33	7.98
	合　計	612.77	2,205.64	2,818.41	2,095.47	722.94

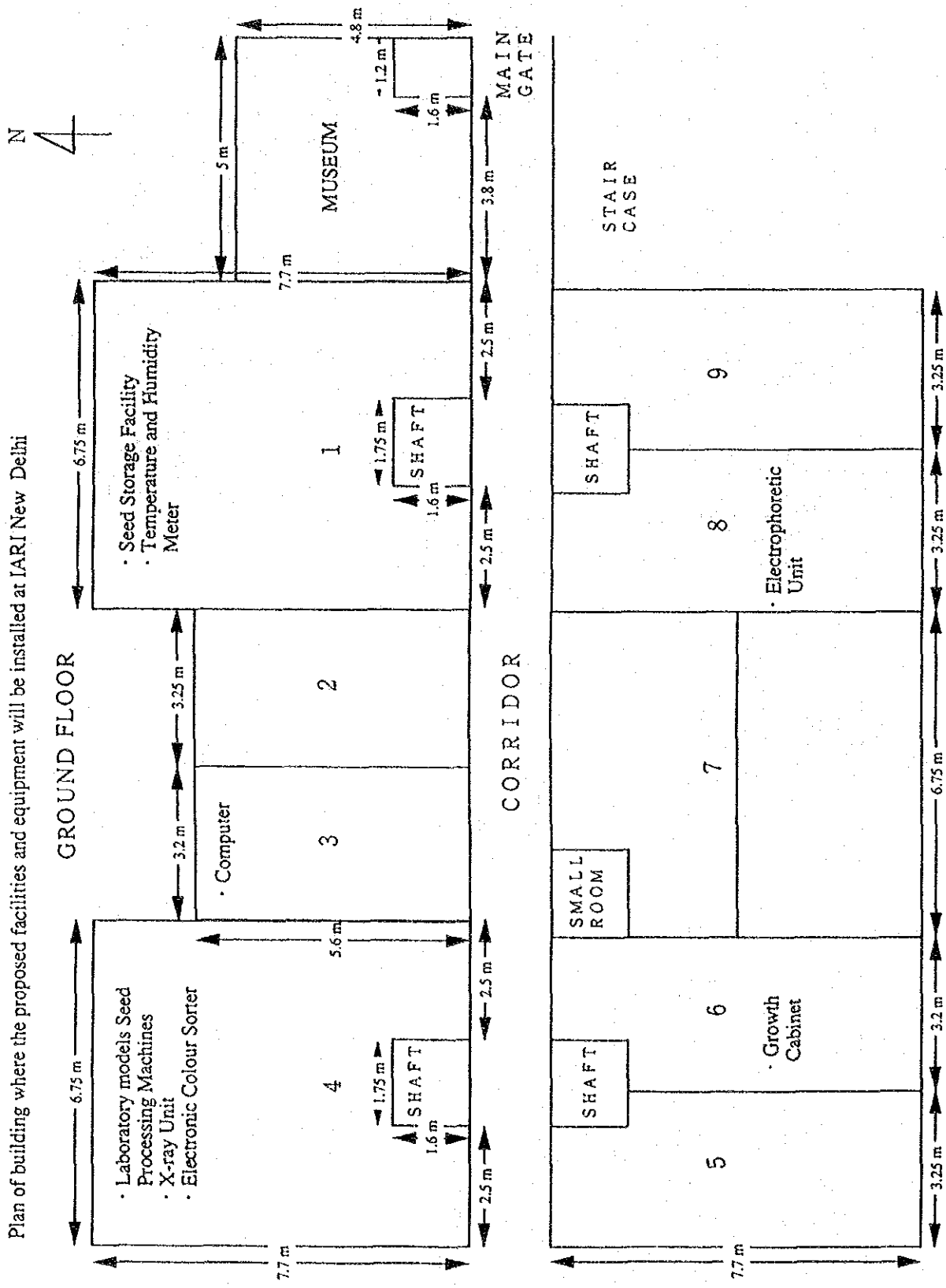
種子貯蔵量〈カルナル農場〉(1993-94)

単位:100Kg

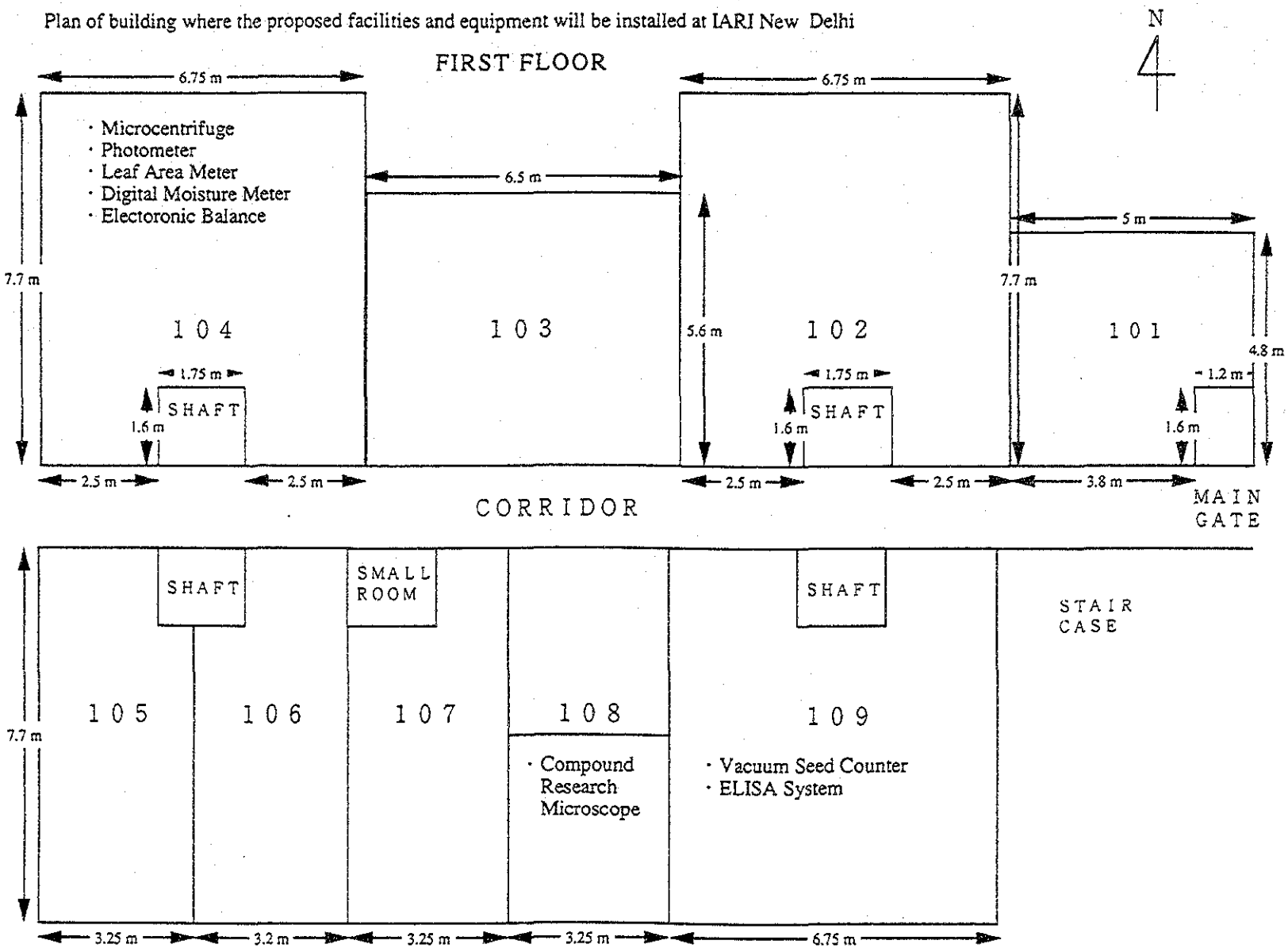
No.	作　物	期首在庫	入庫量	総在庫量	出庫量	繰越し在庫
1	ｺﾑｷﾞ	142.06	1,134.37	1,276.43	1,043.97	232.46
2	ﾄｳｼﾞﾝﾋﾞｴ(Bajra)	9.48	1.79	11.27	8.61	2.66
3	ﾄｳﾓﾛｺｼ	13.77	2.06	15.83	13.21	2.62
4	ｶﾗｼﾅ	11.53	29.30	40.83	38.43	2.40
5	ｲﾈ	276.33	158.25	434.58	143.39	291.19
6	ｿﾙｶﾞﾑ	56.57	46.07	102.64	44.86	57.78
7	ｷﾏﾒ(Arhar)	17.05	16.49	33.54	22.97	10.57
8	ｻｻｹﾞ(Cowpea)	45.40	18.70	64.10	29.68	34.42
9	ﾋｮｺﾏﾒ(Gram)	83.79	159.91	243.70	133.13	110.57
10	ﾋﾗﾏﾒ(Lentil)	5.66	5.55	11.21	9.70	1.51
11	ﾘｮｸﾄｳ(Moong)	30.44	8.45	38.89	16.10	22.79
12	ｴﾝﾄﾞｳ(Matar)	22.87	7.05	59.92	50.27	9.65
13	ﾀﾞｲｽﾞ	7.98	3.36	11.34	4.89	6.45
	合　計	722.93	1,591.35	2,344.28	1,559.21	785.07

(出所：IARI Karnal Regional Station)

Plan of building where the proposed facilities and equipment will be installed at IARI New Delhi



Plan of building where the proposed facilities and equipment will be installed at IARI New Delhi



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