D. S. Ramanathan

Agricultural Research &
Education

VIII Plan.

teri TATA ENERGY RESEARCH INSTITUTE
7, JOR BAGH
NEW DELHI-110003

WWF - India

Immediate Fund Requirements

Interest due to the Godrej Family — 28 lakhs

Products — 40 "

Administration — 2.5 lakh per month

WWF – Regional Office for North India

4th Floor, Palika Bhawan,
Sector 13, R K Puram

Achin

Visits

Dr. Pal

Saradu

Parvathi

Papers : (a) Letter to Mrs. Sheila Dixit about Network Programmes

(b) K. V. Swaminathan

(c) ICAEN Chatterji

(d) Dr. Ramachandran.

(e) TERI

(f) Dilip Nathai

Day 4 and 5, 1989

Working Group on Agricultural Research and Education

Constituted by P.C. on 28 October, 89

1/ (1) Last meeting on 23rd and 24th November.

Constitution of Sub. working Groups

Seven Sub. working Groups were constituted

(a) New Frontiers — Dr. S. Varadarajan

(b) Remedying imbalances among regions and commodities

Dr. A. Appa Rao

(c) Economically and Socially handicapped Sections — Reaching the unreached —

Dr. Har Swaroop Singh

(d) Conserving the productive base of agriculture and linking productivity with jobs and income —

DSS

(e) International collaboration — Dr M.V. Rao

(f) Human Resource Development, NARP and Delivery Systems — Dr Sukhdev Singh

(g) Resources and Financial Management — NES & Krishna Bhatnagar

II Significant Developments

i) King Baudoin Award to ICAR.

ii) UGC Pay scales to Agricultural Scientists
— re-introduction of a Post-certified system
— Possibility

iii) Seminar by Federation of Indian Societies of Agricultural Sciences and Technology

iv) Formation of a National Academy of Agricultural Sciences

III

Crop Scenario : Promising

Tasks ahead : Formidable

Nineties : Critical Decade

240 Million Tonnes of Food grains
320 " Fuel Wood
700 " Fodder.
Other commodities . Milk, eggs etc.

All to be produced from less land and more biotic and abiotic stresses

Eg: Rice : 1967 - 1989 - an increase of 30 million t.
Next decade : 35 Million t.

Wheat 1970 - 1990 : 32 Million t.
1990 - 2000 : ?

First chapter : Features of the Critical decade in terms of food, fodder, fibre, fertilizer and the social, economic and ecological environment

IV Research Strategies : organisation and Management

10 year profile : 5 year financial allocation

① Strategic Research : Mission-oriented basic Research
Bottle Neck

(1a) Maintenance Research

② Applied Research

(2b) Anticipatory Research — Irrigation

③ Adaptive Research — on-farm testing

④ Rural Systems Research < Income / Skilled jobs

⑤ Lab to Land
- operational Research Projects
- National Demonstrations
- Systems and Farm oriented demonstrations
- Krishi Vigyan Kendras (add Udyog or Van component)

New Patterns

① Land upgradation. Each Ag. University ICAR Institute (where appropriate) will assume the ~~Teaching~~ technical guidance responsibility for one district.

(2) Division Node

Eg. Ecological Pest Management Division

	% of sale in the world.	% in India
Herbicide	43	5
Insecticide	30	78
Fungicide	21	15

Weeds: i) Mikania Micranthia

Mass release of thrips

Liothrips mikania

ii) Water Hyacinth

iii) Salvinia molesta

iv) Eupatorium odoratum

Pest White fly in cotton

Leucaena Psyllids

Packages of Technology, Services and Public Policies to achieve a substantial impact in 5 years

(3) Strategic Research - Applied Research Linkage centres

Genetic Enhancement centres.
— Production of desirable R-DNA material

KRISHI NET
Computer - Aided Extension

Computer - Aided Instruction

(4) Customer - Contractor Relationship

(a) other Govt. Depts

Biotechnology
Department of Renewable Energy Sources
Dept. of Environment & Forests
Dept. of Textiles
National Wasteland Development Board.
Sugarcane Board.
National Horticultural Dev. Board.
~~Private Industry~~
~~External Consultancy~~

Allocation of responsibilities & resources

Target Rs 100 crores per year

(b) Private Industry

(c) External consultancy

(d) Technology Diseases – Dairy, oilseeds

Financial Allocation

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one time grant for upgrading facilities and equipment.

General Issues

(1) Agro-climatic Zones — Tailoring the Research thrusts to derive benefit for climatic advantage and to minimise climatic risks

(2) Sustainability : Ecological cons. factors
Water use — aquifer Management.

(3) Pest Surveillance & Forecasting and Integrated Pest Management.

(4) Farm power and implements

(5) Green Manure crops and Soil fertility Management

(7) Farming Systems Research
Crop - livestock mix

(8) Seed Technology

Sub-Working Group on Remedying Imbalances

Crops: Rice, oilseeds, pulses, Rainfed farming.

(1) Rice ⟨ 17 million ha Irrigated
⟨ 23 " Rainfed.

Problem-free
Problem-prone
} Irrigated

Unirrigated

Research Thrusts — Biotic stress

(a) Rice Biotechnology ⟨ Abiotic
Hybrid Rice Program. Raising yield ceiling

Genetic Enhancement Centre for Rice

(b) Seed Technology
(b.) Direct Sowing Technology
(c) Water Management
(d) Soil Fertility Management. — Integrated Nutrient Supply. — Intensive Approach
(e) New Methods of feeding the crop.

(f) Diversification in Rice Farming Systems
Rice - Wheat Rotation Rice Pulses

(2) oilseeds: Technology Mission

CLUSA.

(a) Crop Diversification — Soybean.
(b) Sunflower — Perennial oil seeds.

Rape & soybean initiative

Hybrid Vigour — Somaclonal Variation

Genetic Enhancement Centre for oilseeds

on-farm testing — location specific technologies.

Pest & diseases —

Protein utilization

Seed Technology

(3) Pulses: — Cost-risk-return factor

Stagnating at 13 million tonnes

a) Genetic Enhancement Centre — Pod borer resistance

b) Response to irrigation & nutrition — Cost Reduction in Command area & irrigation projects

c) Agro-meteorological aspects

d) Plant Protection

e) Seed technology

f) Linkage between R+D — Pulse crop production system

(4) Rainfed Farming — Hybrid Pigeon Pea

a) Watershed development — b) Statistics & Jute Econ.

b) Land use planning

c) Agro-forestry

d) Implements

(5) Hill Area Agriculture

Shifting cultivation

Remedying Imbalances

General Point: Animal species

Coastal regions — Integrated aquaculture & agriculture

Agriculture of Tomorrow

Long term sustainability
Economic competitiveness
casting on climate advantage
Needing the requirements of equity & social justice.

(6) Collaboration any Water Technology centres

(7) ~~Rice~~ Animal Husbandry

(8) Green Revolution Research

Farm power & Machinery.
Pest Surveillance & Forecasting

Needs

1. Management Institutes

   Horticultural Management Institute

2. Communication Training Centres

   TV, Radio

3. Non degree Training programmes for School teachers & industrial personnel.

4. NARP
   - Maintenance Research
   - Anticipatory Research

5. Quality & relevance
   - Support to educational programme.

6. Rural Universities & Women's Universities

7. BHU & Aligarh.
   & Central Universities

8. NARP — Third Phase

   Agricultural Education
   ~~Agriculture~~ Agriculture

Sub - Working Group on

Education & Training

Consolidation & not expansion

I Ag. Universities

No need for further Ag. Universities

Concentrate development

II Deemed Universities

III Shortages & Surpluses

Veterinary Post-graduates

Home Science – Rural orientation

Regional centres for Education Technology

IV Women's education & Opportunities

Home Science college – productive role of women.

serve Rural Homes & Farms

V Equipment

VI Refresher courses.

VII Personnel Policies

Centres of Excellence in
Ag. Universities

Forestry courses in 14
Ag. Universities —
all should have
Forestry / Agro-forestry
courses.

Jointly with ICFRE

Specialised Training Centres for Farm Wome

Integrated Farm Research centres for IPM

Professional Societies

National Academy of Agricultural Science

B.Sc in Rural Community Services instead of Home Science

Sub-group on Natural Assets

Improvement of productivity and linking it with profitability and equity

(1) Land + Water Management –

Constitute a Consortium of agencies – of ICAR institutes + Ag Universities

– on-farm management of water

Nehru Rozgar Yojana –

Panchayati Raj. decentralisation

(2) Make an inventory of unskilled jobs – Technology Blending

Krishi Vigyan Kendras

Udyog "

Van

Training Panchayati Raj Mentors

– Man + Woman.

(3) Women – Special attention

(3) Agricultural Universities

on-farm + off-farm

employment : Short term training

~~for the Bhopal Gas-tragedy victims~~ Panchayat

workers

(4) Repository for beneficial organisms

in addition to Biofertilizer

Germplasm Centre.

Designate centres for conservation

Pesticide toxicology needs study

(5) Maximise ~~[illegible]~~ income ~~[illegible]~~ of families

~~[illegible] [illegible] [illegible] [illegible] : 70%~~

(6) Training : More inputs needed.

KVK - One in each district

Manpower for extension —
a serious ~~[illegible]~~ constraint

(7) Target orientation — youth,
women + SFC

Sub. Working Group on

Frontier Technologies

(1) Information : Knowledge.

(2) Technology Alert, Assessment & Forecasting

(3) Computer Simulation Modelling

(4) Use of Media — media serve as powerful tools.
Multi language Co-publication

(5) National Libraries in English & French

(6) Ground Truth studies

(7) Global Atmospheric changes
CO_2 — sea level rise.

(8) Biomass Inventories

(9) Biotechnology applications

DNA Finger printing — seed identification

Anticipatory research for climate change.

One time grant for upgradation to make them critical.

Remote Sensing: Estimation of rice acreage.

Manpower: Lateral Training

Massive training programme

Sub Working Group

Linkages & International collaboration

(1) Role of ICAR in technology transfer.

(2) Role of private sector — breeders' rights

(3) IARI international centres — linkages with ICAR.
CAU, AAU — ICAR.

Collaboration & training

NRI — Tokyo

(4) Memorandum of Understanding with other organisations

(5) Patent & Intellectual Property Rights.
New Strategy for collaboration

(6) Systems Management —

(7) ~~Adequate Resources for~~ Int- Travel

Research on Delivery Systems

Personnel Policies for

Remote areas.

290 positions in the N.E. region
only 40 positions are filled.

Agricultural Implements —
involvement of Rural
Entrepreneurs.

Farming Systems Research —
Components Research.

Sub-working Groups

Research & Training Needs of Economically handicapped sections

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Reaching the unreached

(1) Lab to Land: Ex-Land.

Expenses: Raise from Rs 500 to 1000 per family

(2) Scheduled castes & tribes

(3) National Research centre for Technologies for Farm Women.

Centre for Women in Agricultural Development.

in Agricultural ~~Edn~~ Universities

(4) Implements — accidents — Usha Rai's articles.

(5) New Strategy for Implements

Industrial liaison.

(6) Research programmes for integrated farming

(7) Mechanisation (Women) of farm graduates for part time employment.

Total Requirements

1. Crops : 200 crores
2. Horticulture. 100 crores
3. Agronomy, Soils etc 120 crores
4. Fisheries 70 crores.

Bottlenecks Project

I Crop Sciences

(1) Strengthening of Breeder seed production

(2) Coordinated Programmes: Monitoring system improvement

(3) Active & Base collections — National Gene Bank.

(4) Strengthening of facilities for off-season multiplication & screening of diseases.

(5) New Thrust Areas

(a) Hybrids — Rabi Sorghum, Early Maize, Sunflower Pedicum ~~sfo~~ staple cotton hybrid, Brassica Rice

(b) Drought Resistance breeding Centres of Excellence.

(c) Biological control — biotechnology Botanical pesticides

(d) Support to biotechnology

Rice, Wheat, Gram, Brassica.

(a) Quality Considerations

(b) Cropping system breeding

(6) Pulses & Oilseeds

Division mode approach to research on Pulses.

(7) Wheat Project Directorate

Research Networks — Economic
Crops Diversi — methodology

83.75 crores — 200 crores

VII Plan — VIII

Coordinated Project & Coordinated Program

Drying of Food Processing

Germplasm Conservation
Post Harvest technology
Quality control
Socially relevant
Marketing technologies

VIII Plan
About 100 crores

VII Plan
32 crores.

Domestic Quarantine

Committed liability

ICAR institutes

~~2nd~~ Committed ~~liability~~ liability
~~Carried~~ Comes to haunt the
7th Plan.

II Horticulture

(1) Ranchi + Cudra.

(2) Spices + cashew, Mushroom.

(3) Temperate Horticultin — J+K

(4) oil Palm — New Arunachal
olive.
Kiwi fruits Dangerlein
Avocado —

(5) Export oriented Quality

(6) Post-harvest technology

(7) Flowers + vegetables under protected environments

(8) Rapid Methods of Propagation

(9) Biotechnology

(10) Off season production of vegetables

(11) Tools + Implements

① Maintenance Research in the Green Revolution Areas

② Anticipatory Research

Narmada basin

Tehri Dam area

③ Planning Systems Directorate at Meerut

15 Agro-climatic Zones – Planning Commission

④ Climate Impact Studies

III Soils & Agronomy

(1) Strengthening basic research in Central Institutes

(2) Sustainability, efficiency & profitability

Resource Inventory
Water Management
Nutrient Management
Soil Management
Farming System Management

(3) Resource Inventory
Agro-climatology

(3) Cropping Systems Directorate at Meerut.
Forage, fodder, fuel

(4) Agro-forestry.

(5) Water Management – water conservation.
Small watershed hydrology
Drip, Sprinkler.

(6) On-farm management of water
Water quality & drainage

(7) Local legumes.

(8) Measurement of acidity,
Salinity etc
Management of acid soils

(9) National Bureau of Soil
Survey & Land Use Planning

(10) Indian Institute of Soil Sciences,
Bhopal.

VI Plan.
120 crores

VII Plan
51 crores.

Linkages with National Wasteland
Development Board

Coastal Mangrove vegetation

Fish culture under

Wastes Recycling

Sewage Water

Sugar factory effluents

VIII Plan.

70 crores

IV Fisheries

(1) Fish feed.

(2) Reservoir productivity

(3) Backyard hatchery

(4) Sea Farming – Coastal water ranching

(5) Rural Aquaculture.

(6) Monoculture – intensive farming

– Industrial Aquaculture

(yields have gone up 500 – 600 t/ha

(7) Biotechnology – Polyploidy, Sex control

Hormone.

(8) Pelagic Resources Survey

(9) Island fisheries

(10) Post- Harvest Technology

(11) Economic Modelling – Data bases for stock assessment.

Coordination

Support to Indian Academy of Agricultural Sciences

Centre for Refresher courses
(like IAC – in Wageningen)

Admission Policy: 25% of students from outside

V Education

(1) Quality

(2) Links with Rural & Women's Universities

(3) Centres for Women and Agricultural Development

(3) Man power planning

(4) Support to the Academies of Agr. Sciences,

(5) Central Universities — BHU, Aligarh, Pondicherry

(4) Advanced Centre for Refresher courses.

Total outlay : VII Plan : 89-4

VIII Plan 149-63

Mobility of Students

Development Assistance

Regional centres of Educational Technology

Depts of Ecology & Environment

Financial Needs

(1)	Crops.	200 crores
(2)	Horticulture	100 crores
(3)	Agronomy, Soils etc	120 Crores
(4)	Fisheries	70 crores.
(5)	Education	140 crores.
(6)	NARP	80 Crores
(7)	Animal Science	150 Crores (IBRD)
(8)	Energy	130
	Cost of equipment, books etc (foreign exchange component)	990

Suggested increase

(a) 2 1/2 times of the VII Plan

340.0 crores × 2.5 : 850 crores

(b) 1/2 from other departments : 170 crores for services rendered

Financial Needs & Procedures

(1) Total R&D expenditure : 1% of GNP

Agriculture — 17% of total outlay.

Share of agricultural research is going down. — only 11% of total S&T expenditure

(2) Where is the money growing?

Non Plan	Plan.	Totals
475 (most money goes salaries.)	+ 399	= Rs. 874 crores.

30 crores for enhanced

(3) Coordinated projects — should they be continued on existing lines.

(4) Program based budgetting.

(5) New initiatives

(6) Organisation

(6) Policy towards Technology Missions on oilseed and Dairy — need to be clarified.

(4) From other agencies — Rs 30 crores from the Sugarcane Development Fund.

(5) Consultancy Services — Revenue from other Departments

Money for demonstrations — should come from Development Departments.

(6) One time grant to Universities for equipment (Universities)

(7) Equipment Steering

(8) Cost-benefit analysis ~~is~~ important analysis +

(9) Publications + Information Dept.

(10) Personnel Policies — policy towards staff posted in remote areas

NARP

More money is available due to $ = Rupee exchange ratio. 15 Agro-ecological Zones — to be attended.

Total 201 Cores — 150 crores during VIII Plan

Animal Sciences

(1) Animal Genetic Resources.

(2) Animal Genetics & Breeding

(3) Biotechnology applications

(4) Bioinformatics

VII Plan	VIII Plan
40 crores	130 crores

VIII. Plan

Technology Transfer

32 crores

91. crores

Engineering,
Post harvest
technology
Energy Management

Engineering Extension

- Women

General

(1) Higher allocation during VIII Plan – DG

(2) Adjustment of some heads of expenditure under Plan in Non-Plan using VAC rules

(3) Need for investment in housing and other methods of attracting and retaining good scientists in remote areas.

(4) One time grant of Rs 100 crores for upgrading facilities and for new technologies such as Biotechnology, Information technology and Space technology, Genetic Enhancement Centres

Budget

1. Crops .. 200 crores
2. Horticultin 100 crores.
3. Agronomy, Soils 120 crores
4. Fisheries 70 ..
5. Education 140
6. NARP 150 .. (IBRD)
7. Animal Sciences 130 ..
8. Technology Transfer 91 ..
9. Ag. Engineering Energy 65 ..
10. Economics + Statistics . 15