



**GOVERNMENT OF GUJARAT**

**EVALUATION REPORT OF THE THIRD FIVE  
YEAR PLAN SCHEME, RESEARCH IN  
AGRICULTURAL CHEMISTRY AND  
SOIL SCIENCE**



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**IRECTORATE OF EVALUATION  
GOVERNMENT OF GUJARAT,  
AHMEDABAD.**

## P R E F A C E

The Government of Gujarat had decided to undertake evaluation of a few selected schemes included in the Third Five Year Plan of the State. The Chief Secretary to the Government is the Chairman of the Committees for schemes envisaging an outlay of Rs 20 lakhs and over. While for schemes envisaging an outlay of between Rs 10 lakhs, and 20 lakhs the Secretary to the Government in the concerned Secretariat Department is appointed as the Chairman of the Committee.

The report in the pages that follow, presents the findings of the Committee under the Chairmanship of the Secretary to the Government, Agriculture and Co-operation Department on the Third Five Year Plan scheme "Research in Agriculture Chemistry and Soil Science"

Ahmedabad, 20 th September 1966

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# EVALUATION REPORT OF RESEARCH IN AGRICULTURAL CHEMISTRY AND SOIL SCIENCE

Sector Agricultural Programme :	Agricultural Production
Implementing Agency :	Director of Agriculture
Area of operation	Gujarat State.

## 1. Genesis of study

1.1 The Government in General Administration Department (Planning) *vide* their Circular No EVL/1062-J, dated 14th August, 1962 decided to undertake an Evaluation Study of the Third Five Year Plan Scheme (number 16) Research in Agricultural Chemistry and Soil Science and for this purpose appointed a Committee under the Chairmanship of Secretary, Revenue and Agriculture Department. Other members of the Committee were (1) Secretary, Finance Department, or his nominee (2) Director of Bureau of Economics and Statistics (3) Director of Agriculture and (4) Deputy Secretary, Revenue and Agriculture Department (Member-Secretary). The Committee was reconstituted *vide* General Administration Department (Planning) Circular No EVL-1262-J/ dated 30th April, 1963 where-under Deputy Secretary, General Administration Department was nominated as a Member. The Committee was again reconstituted *vide* General Administration Department Circular No 1262-TH dated 17th June 1965 and the Director of Bureau of Economics and Statistics was replaced by Director of Evaluation.

1.2 The Committee reviewed the progress of the scheme, discussed and examined the notes prepared by the Director of Agriculture on difficulties encountered in implementation thereof at the meetings held on 26th September 1962, 18th January 1963, 27th June 1963 and 5th November 1963.

1.3 The Report on the Evaluation Study of Research in Agricultural Chemistry and Soil Science is based on the notes prepared by the Directorate of Agriculture, the proceedings of the meetings of Departmental Evaluation Committee covering the discussions on these notes and supplementary data collected from the Director of Agriculture.

## 2. General Description

2.1 As a basic science, Agricultural Chemistry has continued to help every branch of Agriculture. Agricultural Chemistry deals with the problems of soil fertility and ways and means to promote the soil fertility by scientific method. This can be done by thorough understanding of the

relationship between plant growth and soil conditions particularly present and availability of nutrients, soil water and complex soil reactions *vis-a-vis* the requirements of crops. In order to correctly understand the problem and to recommend suitable measures, research in Agricultural Chemistry and Soil Science becomes absolutely essential for progress in agriculture

### 3. Objectives of Research

3.1 To carry out comprehensive research in scarcity and rainfall areas which are subject to drought and soil erosions resulting in crop failures and loss of soil fertility

3.2 To evolve suitable methods for soil conservation agronomic practices and reclamation of inferior lands ultimately leading to efficient system of land use for different soil climate regions of the problem areas of Gujarat State

3.3 To initiate and carry out survey and classification of different soils and to prepare soil map of the State. The purpose is that soil genesis, nutrients status, soil muerology, etc would be available on the record. The schéme will also help in preparing a water map of Gujarat through analysis of water samples from different areas

### 4. Financial Progress

4.1 The total plan outlay on the scheme is Rs 10 lakhs. The year-wise phasing of the plan outlay, budget provision for each of the years and the year-wise expenditure is shown in the table given below

Year	(Rs in lakhs)				
	Plan outlay	Budget provision	Expenditure incurred	percentage of expenditure to Plan outlay	Percentage of expenditure to budget provision
1961-62	1.69	0.76	0.04	2.4	5.3
1962-63	2.54	0.34	0.16	6.3	47.1
1963-64	3.07	0.31	0.25	8.1	80.7
1964-65	1.33	0.74	0.37	27.8	50.0
1965-56	1.37	0.52	0.52A	38.0	100.0
<b>Total</b>	<b>10.00</b>	<b>2.67</b>	<b>1.34</b>	<b>13.4</b>	<b>50.2</b>

A-anticipated.

4 2 In the first two years of the Third Plan, expenditure was incurred only for preliminaries and purchase of available equipment. Due to non-availability of foreign exchange, specialised equipment for the soil laboratory could not be purchased and hence the expenditure incurred on the scheme has fallen short of budget provision and plan outlay.

## 5 Physical Progress

5 1 The investigations under the scheme can broadly be classified into three categories, viz., (1) Soil Biochemical investigations (2) Salinity studies and, (3) Soil survey and classification. Work carried out under each aspect is given below.

## 6. Soil Biochemical Aspect

6 1 *Nitrification Studies*—Investigations were undertaken in two series to study the nitrifiability of different nitrogenous carriers viz. Ammonium Sulphate, Urea, Groundnut Cake (ordinary), Groundnut Cake (extraction), Calcium Ammonium Nitrate and Ammonium Sulphate Nitrate in two main soil groups of Gujarat: i.e. medium black soil and goradu soils. Interesting results have been obtained which are being further studied in the laboratory for final conclusions.

6 2 An evaluation study of different varieties of cereals and pulses was undertaken to assess the nutritive value of different varieties of each crop. The results have given a good idea of the comparative quality of different varieties.

6 3 Two experiments are in progress at Agricultural Research Station, Arnej to study the problem of spottedness of wheat grains in Bhal tract.

6 4 Experiments to study the organic matter, buildup of the soils in different agroclimatic zones of the State have been taken up, to study the fluctuations in the organic matter content and its Biochemical make up of the soils.

6 5 A field trial has been taken up at Central Experimental Research Station, Junagadh to study the nitrogen fixing capacity of different leguminous crops. The results of the trial will form the basis for future regular experiments on different soil groups.

6 6 The proximate analysis of the samples of plants straw, grams, oil cakes, feeding stuff etc were undertaken as and when samples were received from research stations where special experiments have been taken up by different specialists to study the effect of treatment on quality etc. Similar analysis was carried out in respect of materials received from private sources for advice.

## 7. Salinity Studies

7 1 The fertility as well as salinity analysis of the soils of all the taluka seed multiplication farms, have been undertaken. Appropriate reclamation measures have been recommended in cases where the soils were found to be saline. So far analysis of the soils of 75 seed farms have been completed.

7 2 There are vast areas of saline and alkaline soils in North Gujarat. In order to study, if these can be reclaimed by the application of gypsum, trials have been started from Rabi season of 1964-65 in cultivators fields after ascertaining the gypsum requirements of such soils in the laboratory. The work is in progress.

7 3 Laboratory study has been undertaken to evolve suitable techniques for reclamation of saline alkaline soil. An experiment covering different treatments in respect of one soil amendment practice is in progress.

## 8 Soil Survey Work

8 1 A start was made with the collection of profiles and the analytical work has been taken up recently. The analysis will give an idea about the physical, chemical and morphological characters of different soil groups, and will be of use in genetic-classification of the soils. For studying the genetic characteristics of the soils of Dang district, a topographical map of the district has been obtained from Dehradun.

## 9 Laboratory Equipment

9 1 The equipment required for the laboratory is listed below.

- (1) Thermostatic constant temperature
- (2) Water bath (electrically heated)
- (3) Water bath (gas heated)
- (4) Magnetic stirrer
- (5) Sand bath (electric)
- (6) Refrigerator
- (7) Micro-kjeldahl distillation apparatus
- (8) Homogeniser
- (9) Grinding machine
- (10) Electric drier
- (11) Cupboards
- (12) Muffle furnace
- (13) Incubators
- (14) Grometrography apparatus
- (15) Autoclave (vertical)
- (16) Crook bearing machine
- (17) Spectro photometer
- (18) Polorograph
- (19) Photo fluoro meter

- (20) Metter balance  
 (21) Saccharimeter  
 (22) Electric oven

9 2 Of the above items, items at serial Nos 1 to 14 have been received but the Grometrography apparatus was received in a broken condition, and hence the company has been requested to replace the same. The item at serial No 22 was received in the year 1963 but was sent back as it was received in a broken condition.

9 3 The items at serial Nos 17 to 21 could not be purchased for want of foreign exchange. The experience has been that the item requiring foreign exchange cannot be purchased due to want of import licence and the question requires to be taken up at Government level.

## 10. Personnel

10 1 The personnel for the scheme, the date of sanction for the posts and the staff in position as on 30th September 1965 are shown in the table below —

TABLE

Staff required	Date of sanction		In position as on 30-9- 65 (yes/no)	
	January 63. No of posts	November 64 No of posts		
1 Soil Survey Officer (GAS. Class II)		1	No	
2 Salt Land Reclamation officer (GAS Class II)	.. ..	1	Yes	
3 Soil Biochemist (GAS Class II)	..	..	Yes	
4 Agriculture Assistants	..	2	1	Yes
5 Agricultural Officers	..	2	1	Yes
6 Computer	..	1		Yes
7 Tracer	.. ..	..	1	Yes
8 Survey Khalasis	.. ..	..	2	No
9 Laboratory Boys	..	2		Yes
10 Peons	..	2	..	Yes

## 11. Recommendations

11 1 In cases where delay is caused on account of frequent queries and references, the outstanding issues should be settled by personal discussions at appropriate levels in the Government.

11 2 For future programmes of like nature the possibility of obtaining Government sanction for the entire scheme for the Plan period, should be examined—expenditure being limited to availability of funds from year to year.

11 3 Research studies and surveys taken up under the scheme should have sufficient scope to produce results suited for diversified field conditions.