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REPORT OF THE  
AGRICULTURAL RESEARCH WORKSHOP COMMITTEE  
ON  
IMPROVING THE AGRICULTURAL RESEARCH SYSTEM IN GUYANA



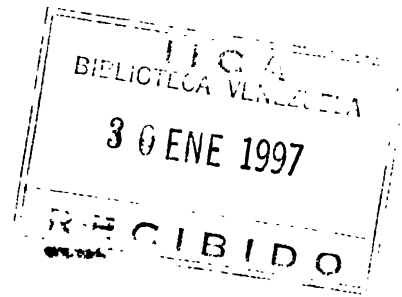
**INTER-AMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE**

**P.O. BOX 10-1000, GEORGETOWN, GUYANA,**

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REPORT OF THE  
AGRICULTURAL RESEARCH WORKSHOP COMMITTEE  
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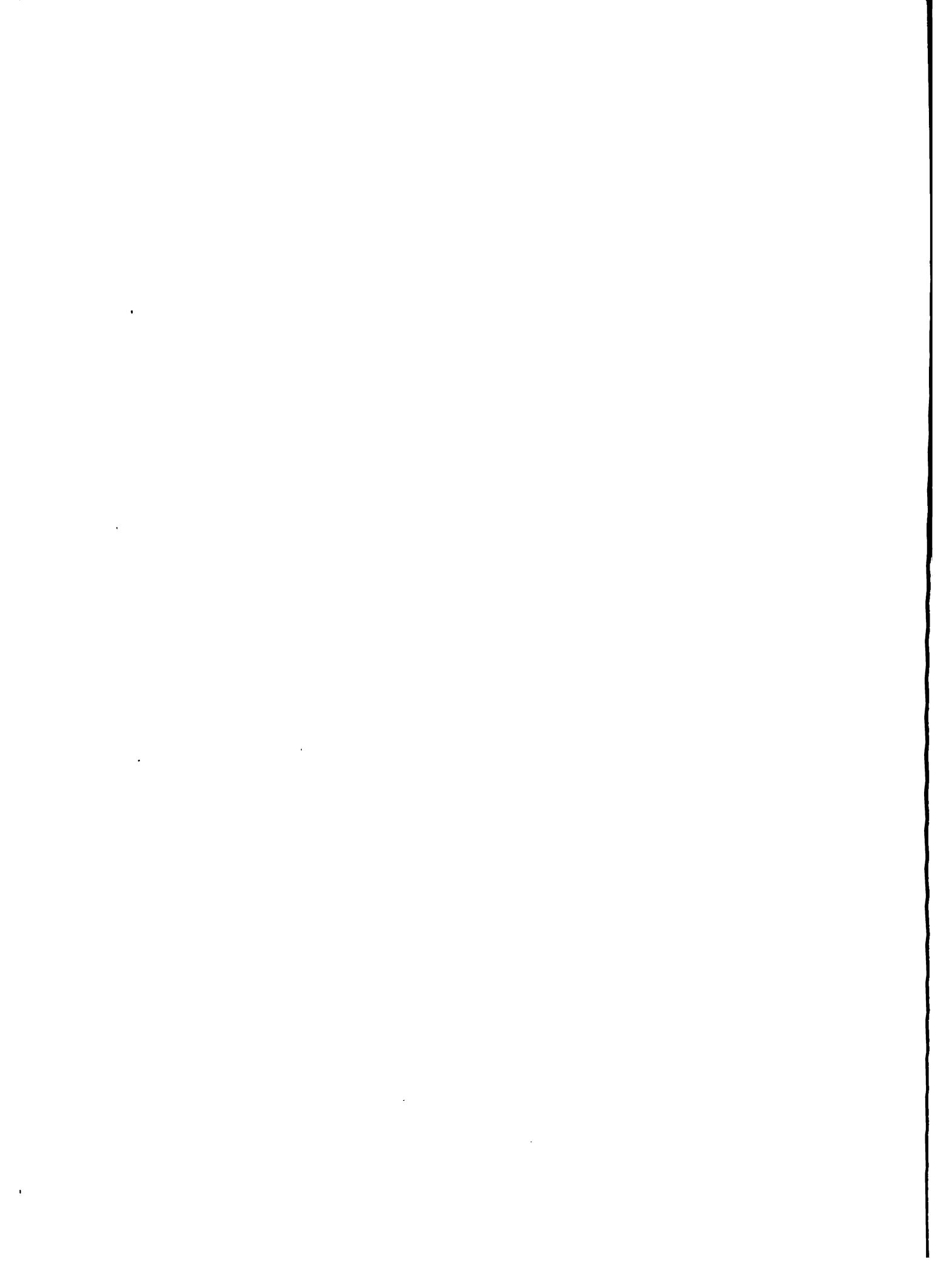
One outcome of the "Workshop on Agricultural Research and Development in Guyana", sponsored by the Ministry of Agriculture and the Inter-American Institute for Cooperation on Agriculture (IICA), and held at the BIDCO Management Training Centre on December 3 and 4, 1981, was the formation of an Agricultural Research Workshop Committee to study the existing system and to make recommendations aimed at increasing its efficiency and effectiveness.

The Committee comprised the following persons, all of whom are Guyanese nationals, many of whom have had tremendous experience in the existing system:

- Dr. J.R.D. Ford (Co-ordinator) - Farm Management Specialist, IICA
- Mr. C. Bullen - Agricultural Officer (Soil Science),  
Ministry of Agriculture
- Dr. A.V. Downer - Research Director, Institute of Applied  
Science and Technology
- Mr. E. Hubbard - Chief Agricultural Officer,  
Ministry of Agriculture
- Mr. W. Matadial - Principal Agricultural Officer (Extension),  
Ministry of Agriculture
- Dr. G. Muller - Manager (Other Crops), Guyana  
Sugar Corporation
- Mr. H. Persaud - Principal Agricultural Officer (Crop Science),  
Ministry of Agriculture

This report contains the recommendations of this Committee with inputs from Dr. R.E. Pierre, Director of the IICA Office in Guyana.

REP.  
1982-01-22

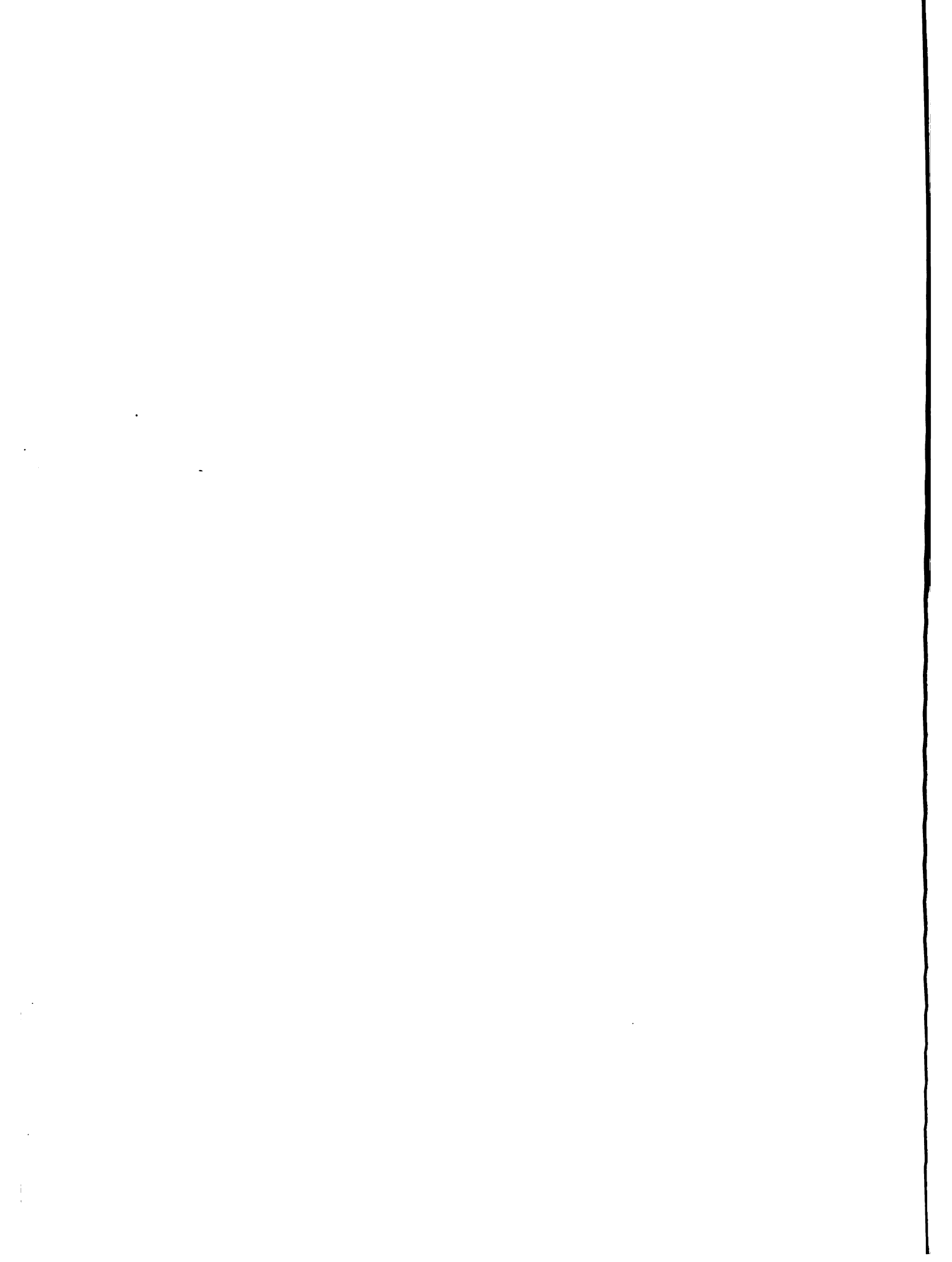


## INTRODUCTION

The need for agricultural development in Guyana and the importance of technology development systems as contributors to this development has been clearly recognized and accepted by the cross-section of professionals working in the directly related areas. Beyond this general recognition and acceptance there is need for agreement regarding the structure and components of a technology development system and how they should relate to each other. In other words, how should the research stage (generation of technology) relate to the diffusion and application stages (adoption or transfer of technology), and what is the best institutional arrangement for utilizing available resources in these areas effectively. These questions are critical because they affect both the rate (quantity) and relevance (quality) of products realized from the agricultural technology system and therefore determine pace, direction and effectiveness of the development of the agricultural sector. Agriculture is the major activity in rural Guyana which forms the larger part of the regional system. Thus, the development of agriculture in a dynamic and scientific way will do much for the development of rural and regional systems.

The existing system for the generation, development and diffusion of agricultural technology has, for some time now, been considered to be short of what is desired and necessary for the development of Guyana's agricultural sector. Generally, this is a result of a number of shortcomings of the system among which are the following:

- i) An inability to retain research workers in a professional context;
- ii) A very fragmented framework - several distinct and separate departments leading to problems in planning, policy-making and co-ordination, wastage of resources and narrowness of focus;
- iii) A lack of emphasis on involvement of farmers which adversely affects the relevance of research work and the adoption of technology generated.





- iv) Inefficient and ineffective utilization of technical staff and financial resources in pursuit of the goals set for or by the system.

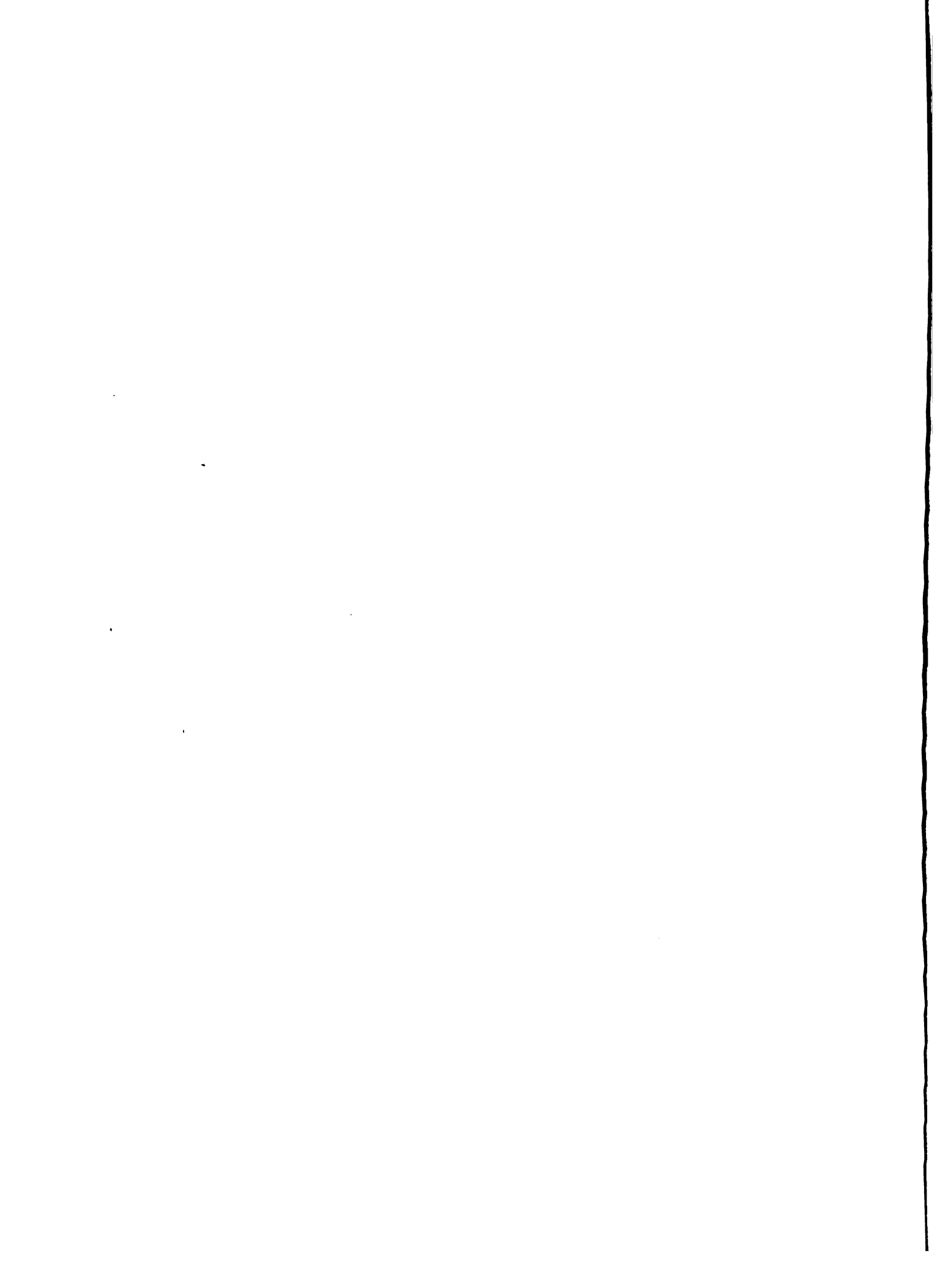
Recognition of these shortcomings is not recent; agricultural research seminars held in 1974 and 1977 pointed to these shortcomings and suggested changes for improvement which are here endorsed. The conclusions and recommendations of these seminars, given in Appendices I and II support the arguments advanced in this paper. It is felt, however, that the most recent workshop (December, 1981) on the subject placed the matter in focus and benefitted from time in three respects. Firstly, time has reinforced the feeling of the agricultural professionals that changes within the present structure as opposed to changes of the structure would be to no avail, hence both the structure and components of the system need attention. Secondly, an important feature of the present time is the regional system of administration now in force and this would be of critical significance to the emergence of a successful technology development and diffusion system. Research and extension would need to be spread throughout Guyana and to involve those who are actually engaged in the agricultural production aspects, i.e. the farmers. Thirdly, it is felt that the recent appointment of an agriculturalist to the post of Permanent Secretary to the Minister of Agriculture is of great positive significance and is indicative of the political appreciation of the gravity and urgency of the need for a new approach to agricultural development efforts at this time.

Discussion at the recent workshop led to the appointment of a "Research Workshop Committee" which was charged with the responsibility of examining the existing technology development and diffusion system and making recommendations for improvement thereof.

This presentation, accordingly, attempts to:

- evaluate the impact of the existing system;
- suggest modifications to make the system effective;

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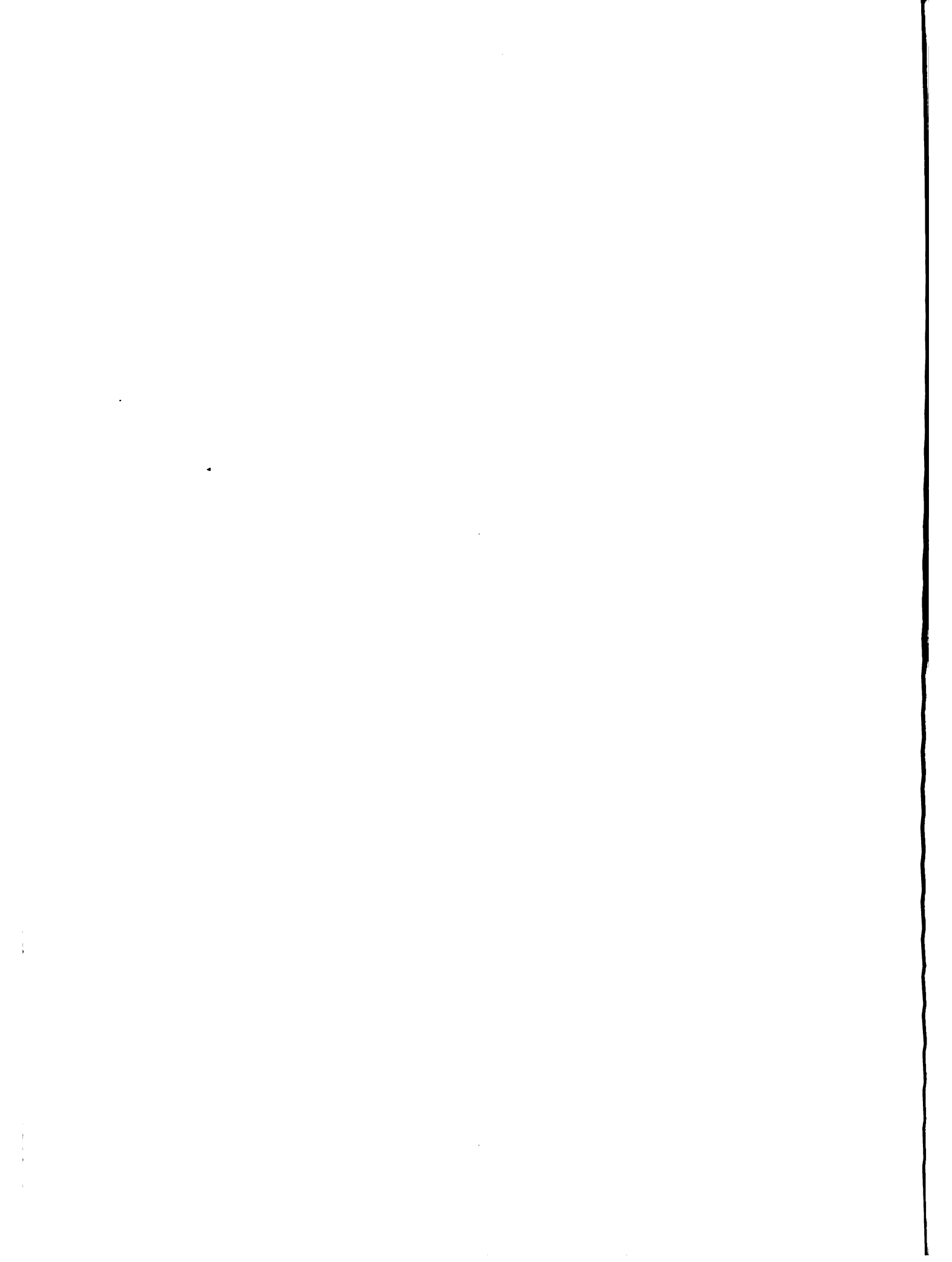


- discuss the anticipated impact of such modifications; and
- give some consideration to the transition from the existing to the modified system.

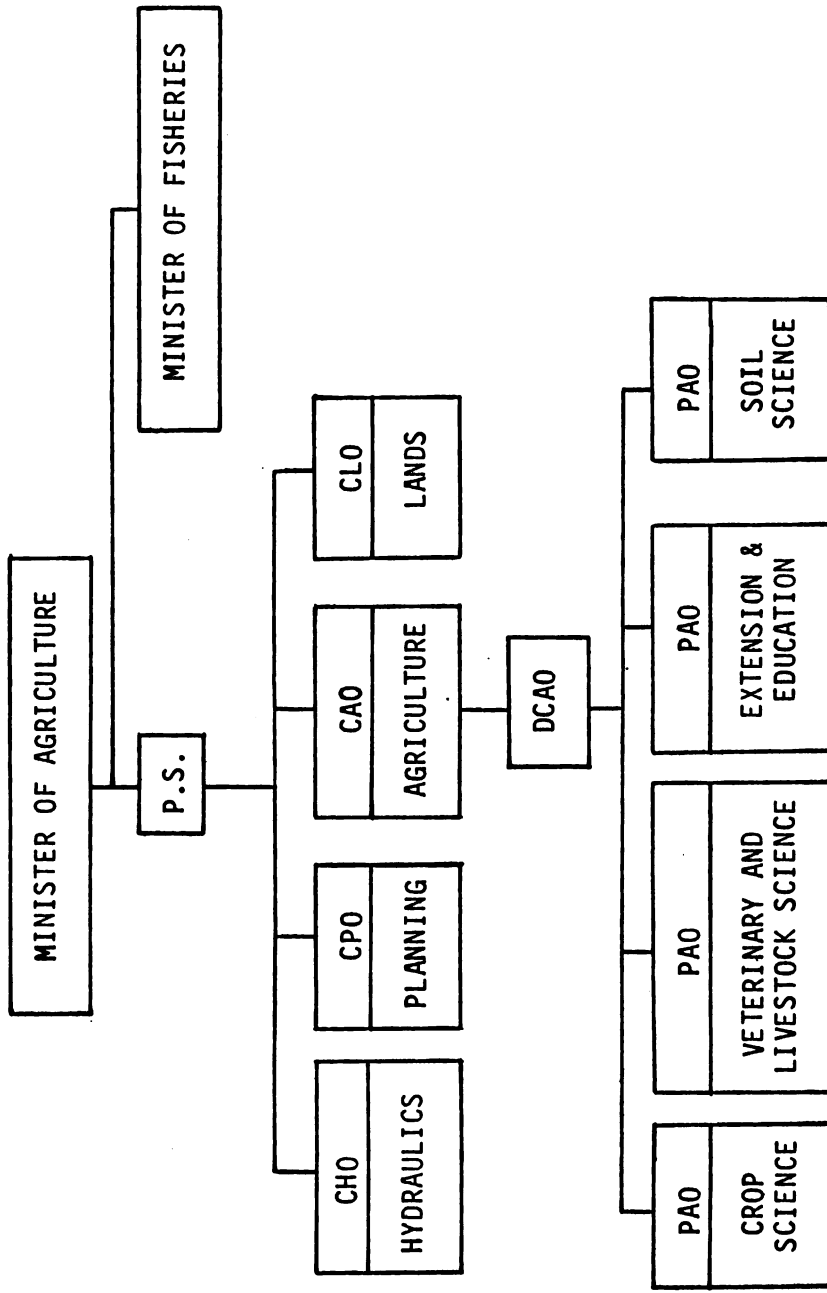
#### EXISTING SYSTEM

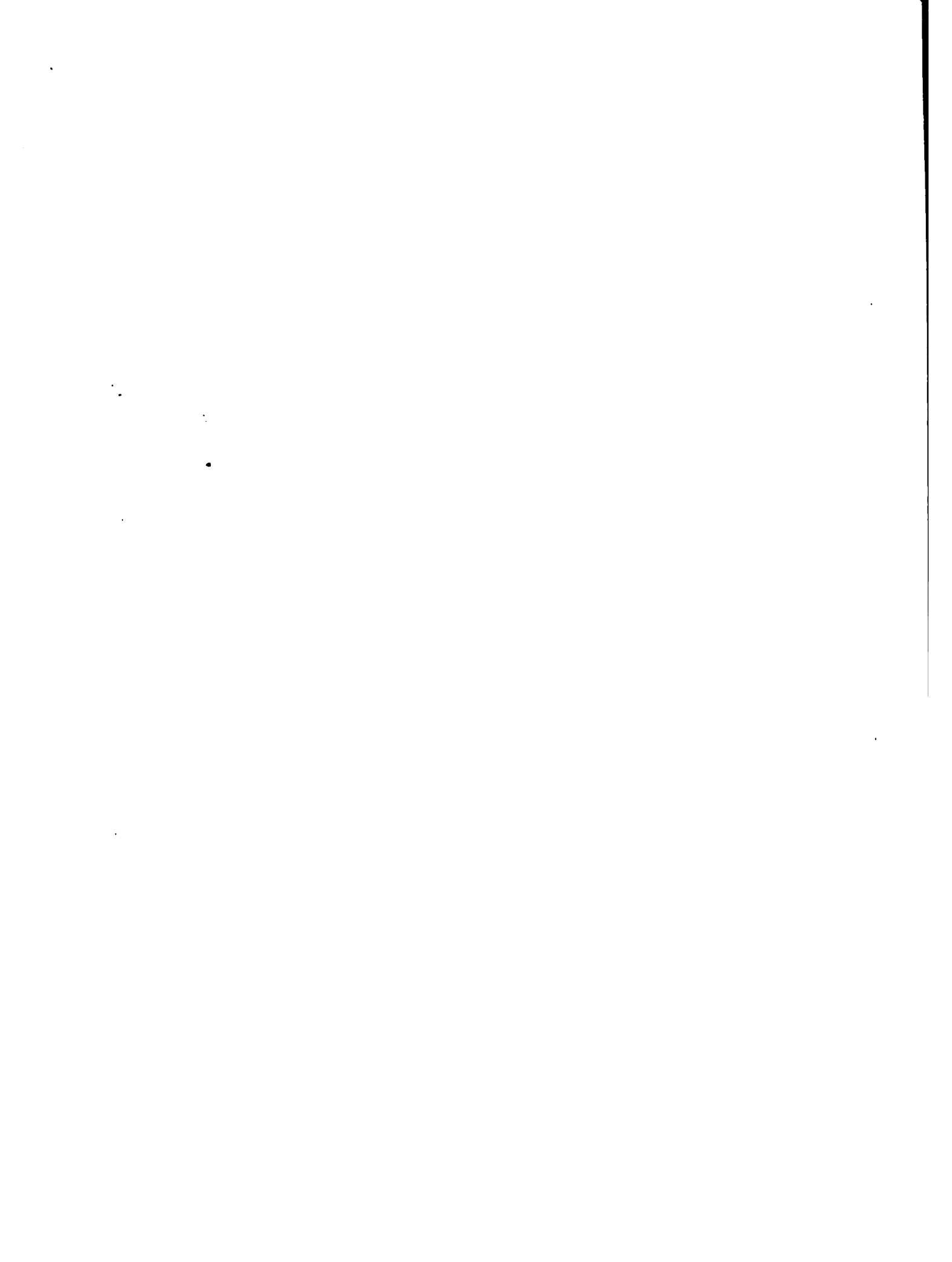
The existing technology development and diffusion system comprises the research and extension services of the Ministry of Agriculture with the Central Agricultural Station (C.A.S.) being conventionally regarded as the research entity. In fact, four separate units, headed by principal agricultural officers (P.A.O.) within the Ministry of Agriculture, are geared towards the performance of Research, Extension and other service functions. These units, as shown in Figure 1, are Crop Science, Veterinary and Livestock Science, Soil Science and Extension and Education. The Extension and Veterinary and Livestock Divisions have representatives distributed over the country. The Crop Science and Soil Science Divisions are essentially located at C.A.S. There is also a small Livestock unit at C.A.S.

For reasons of history, C.A.S. is associated with the Research function while the Extension Division bears responsibility for a variety of functions including collection of production data, sale and/or distribution of inputs, forecasting of productivity levels, provision of technical information to farmers, etc. Until relatively recently, the Extension Division bore responsibility in both the areas of Crop and Livestock production, a direct consequence of the era in which the Ministry of Agriculture consisted of three components - Research, Extension and Veterinary Science - each under an Assistant Director of Agriculture. It was during this era, the 1950's, that C.A.S. was conceptualized and developed. At that time, C.A.S. was considered to be optimal in location if only because it straddled three of the four types of soil then known to occur in the country and all the coastal soils. But it is now known that C.A.S. merely covers three of some sixty (60) soil types in the coastal area.



**FIGURE 1: PRESENT GOVERNMENTAL SYSTEM SHOWING THE FOUR RESEARCH AND EXTENSION COMPONENTS**



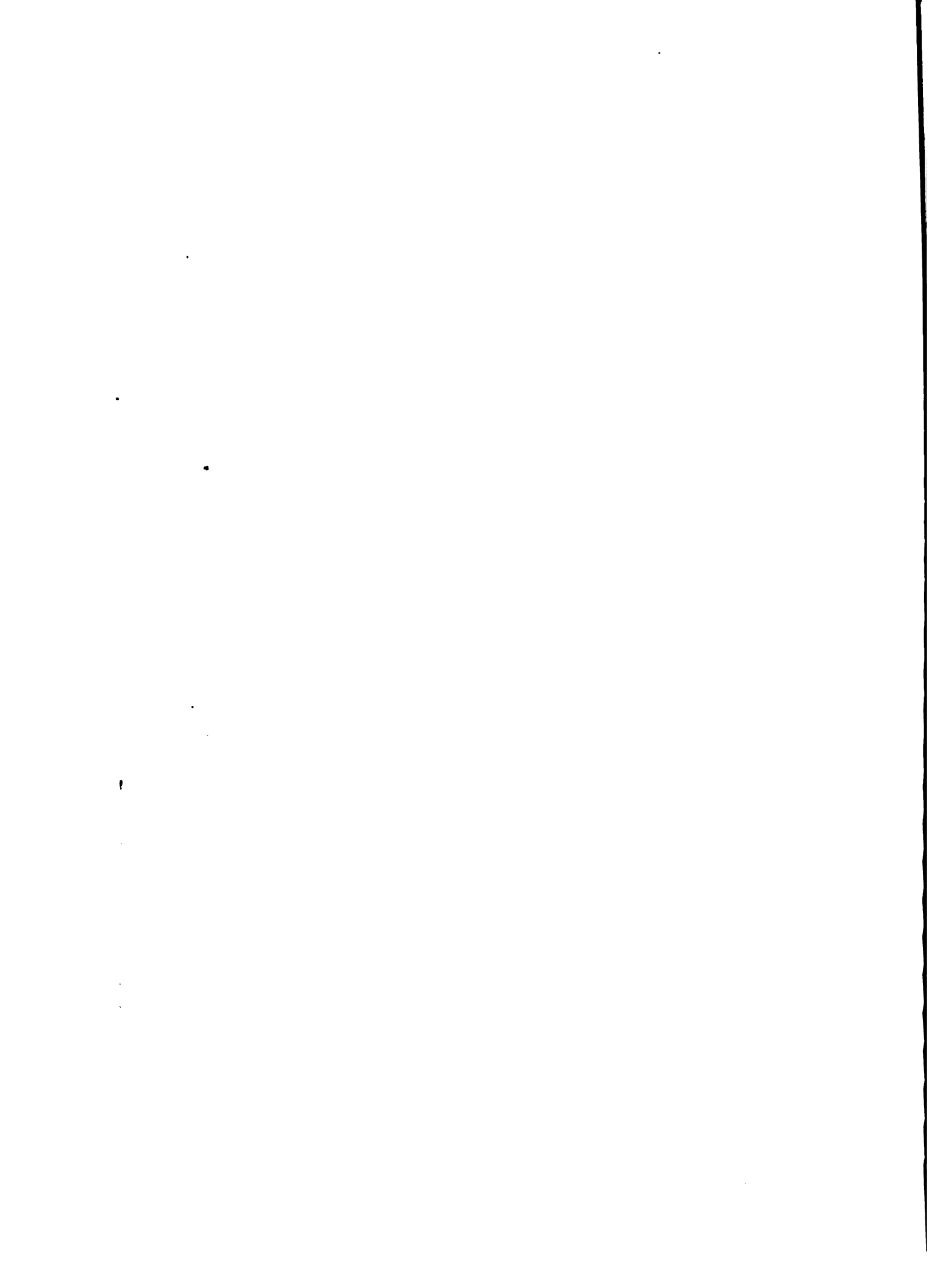


As C.A.S. developed, it provided facilities for laboratory analyses and field trials. It also accommodated the offices of the Extension arm of the East Demerara Extension district. But with the passage of time, the relevance and reliability of field trials have both suffered partly because of the location of C.A.S. and partly because of the research philosophy by which the station was directed.

In the course of its evolution, C.A.S. nurtured the Guyana School of Agriculture (G.S.A.) which has now grown up into an autonomous corporation with its own infrastructural works and farming operations. The duration and extent of involvement of C.A.S. in the national Agricultural Education effort has been not only unstructured but also very short-lived. It should be mentioned, however, that several members of the C.A.S. staff still serve as teachers at G.S.A.

In terms of the research function, C.A.S. has had, for the greater part of its existence, two sections, i.e. Crop Science and Veterinary and Livestock Science. In the relatively recent past, the latter was relinquished and the Crop Science Division was split into the Crop Science and Soil Science Divisions. The changes or developments over the last 25 years have succeeded in satisfying neither the government which provides funding nor the farmers who are the potential users of the technology generated.

The reason for this state of affairs is considered to be largely organizational in nature. Research activities are far removed from the farmer with the Extension service serving, in theory, to bridge the gap between Research and Production. But this has not been effective. Further, the introduction of the regional administration system encourages a prognosis that the efficacy of the system will degenerate even more because of the fact that agricultural field workers (extensionists) have become twice separated from the technology generating centre. It is noteworthy that during the 1974 seminar, the Permanent Secretary (Regional Development) was at pains to describe certain proposals for regional agricultural organization. He





indicated that this would hinge on farmer associations which would be commodity based and whose representatives would speak on behalf of the respective memberships at regional meetings. He strongly supported the need for a strong Farmer-Extension-Research linkage. This serves to reinforce the need for attention and change in this important area of support to agricultural development.

#### PROPOSED SYSTEM

Agricultural research and extension systems have been evolving rapidly throughout the world and the success stories in the developing world, such as EMBRAPA in Brazil, ICTA in Guatemala and Benor's system in Asia, are now fairly common knowledge among agriculturalists. The basic reason for the success of these systems seems to be that Research and Extension are considered in the context of Development and Diffusion of relevant and appropriate technology. Diffusion being recognized here as a process rather than an event. Like change, per se, the rate of the process of diffusion can be influenced by the quality of management devoted to it. Figure 2 illustrates the essential and tangible difference between the traditional (Research-Extension) system and the new concept of Technology Development and Diffusion which shows a reciprocal information flow between Researcher, Extensionist and Farmer.

#### One Unit:

The proposed system advocates the creation of one unit - a semi-autonomous Agricultural Research and Development Institute. The system presented here adopts aspects of successful efforts elsewhere where it is felt that they are relevant to Guyana and are applicable in the national situation. Figure 3 gives an overall view of how the proposed Institute is envisaged to fit into the Ministerial System

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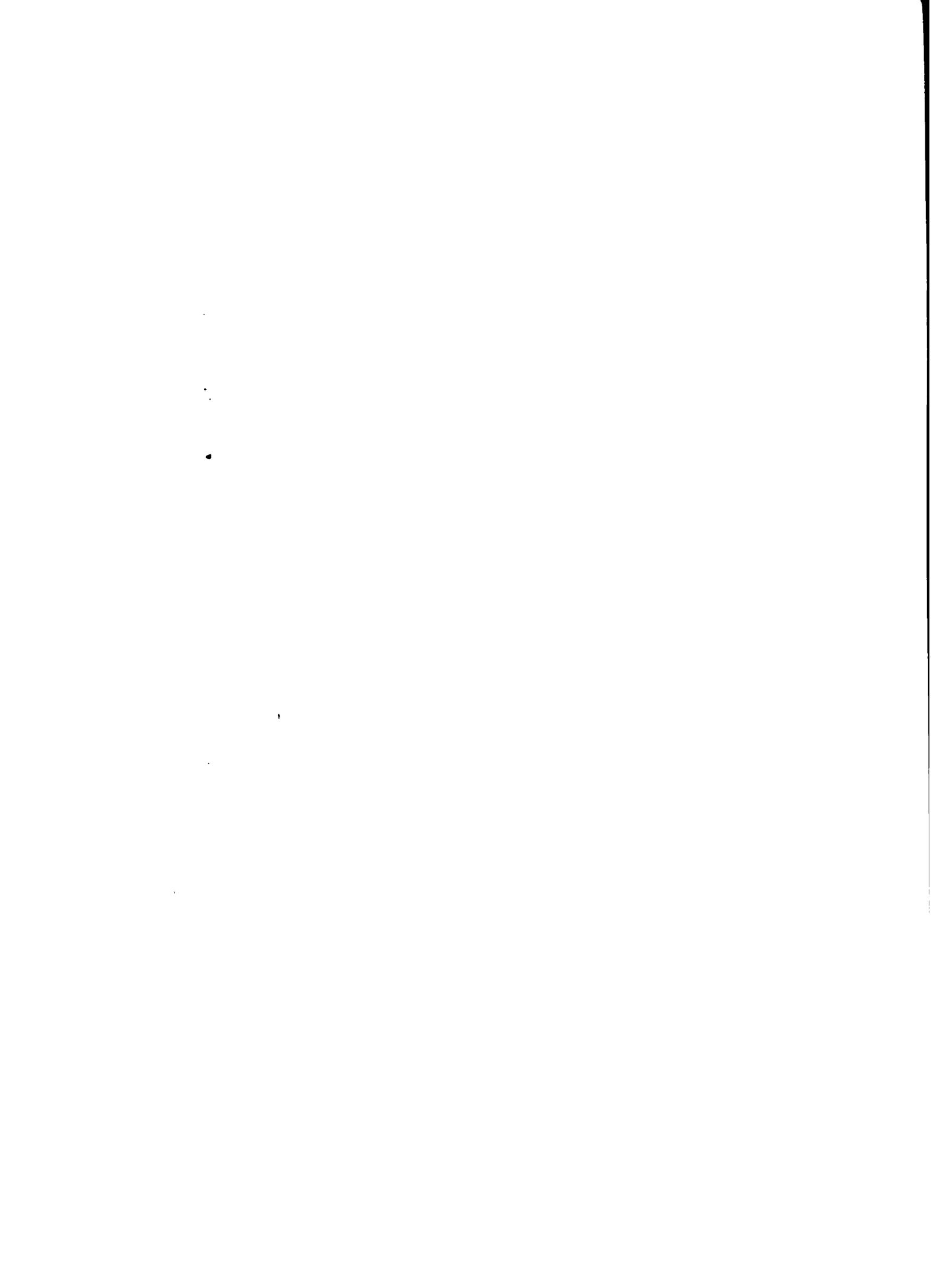
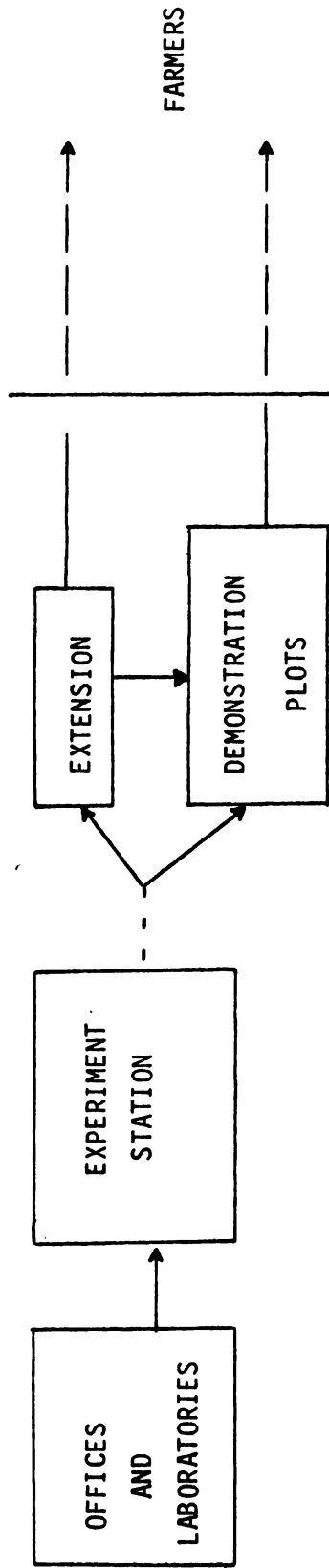
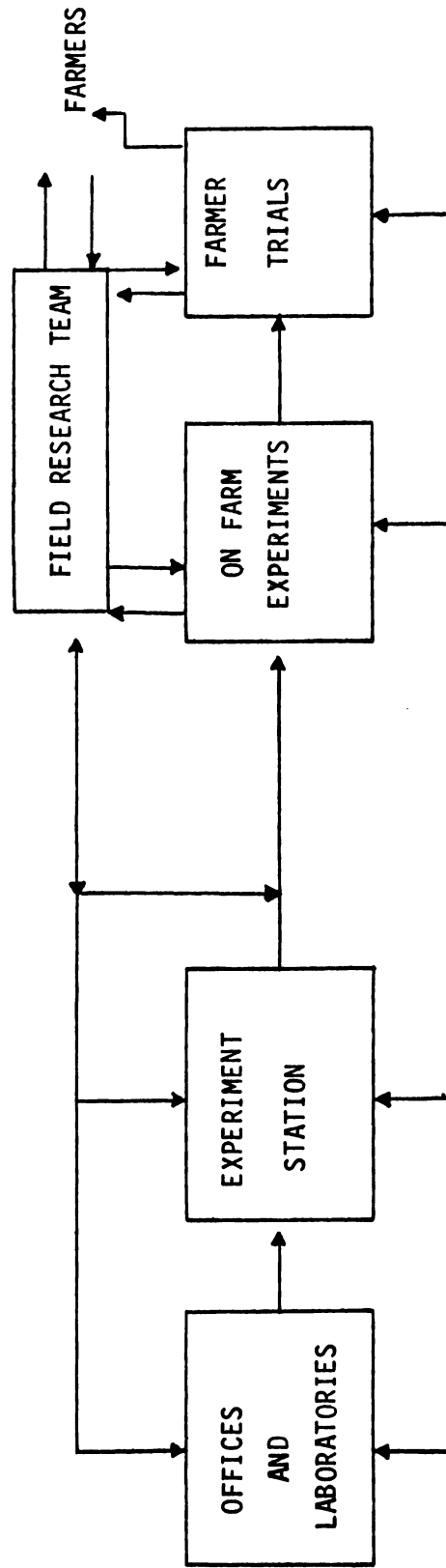


FIGURE 2: TRADITIONAL AND MODERN CONCEPTS OF AGRICULTURAL TECHNOLOGY DEVELOPMENT AND DIFFUSION

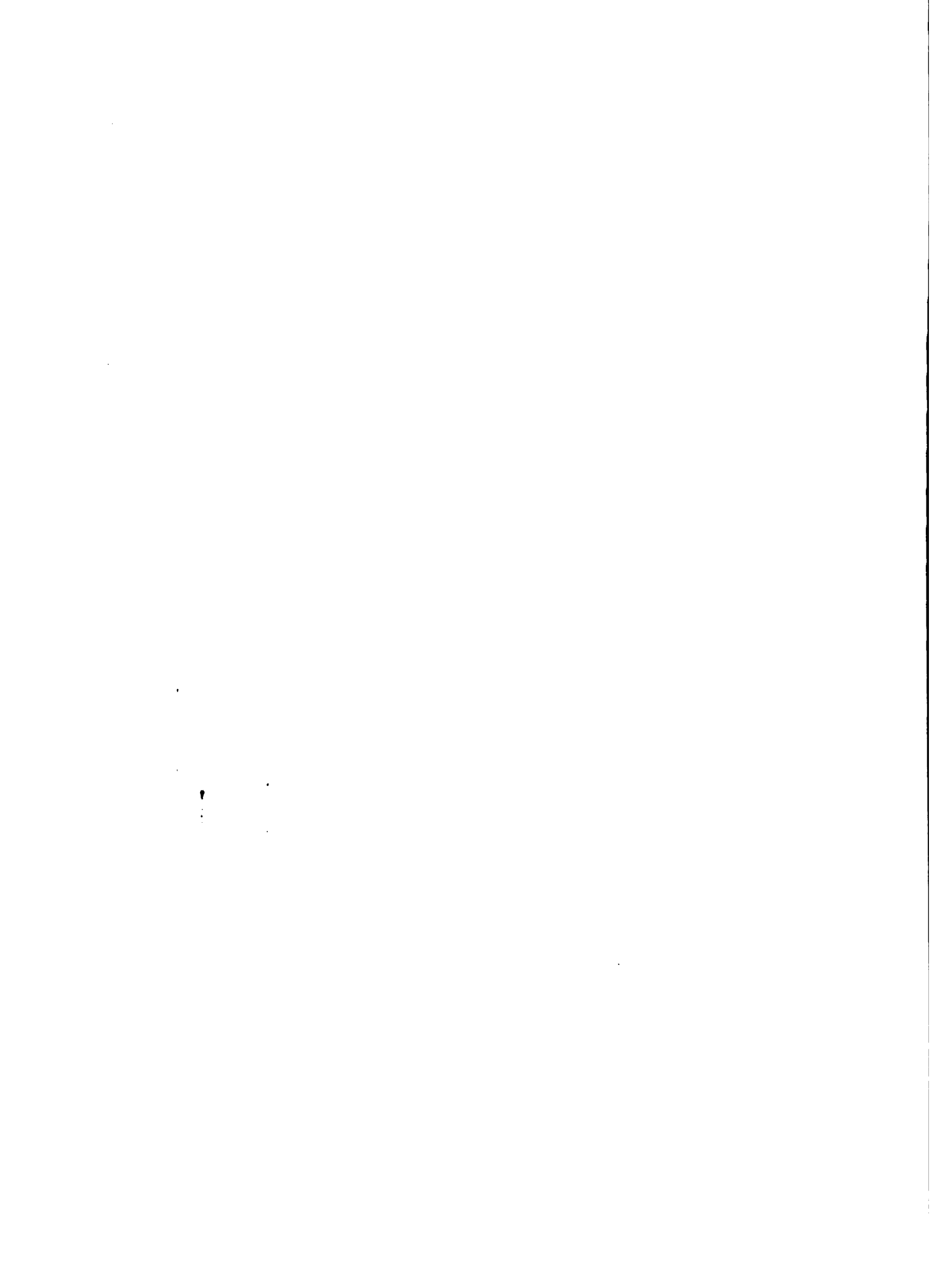


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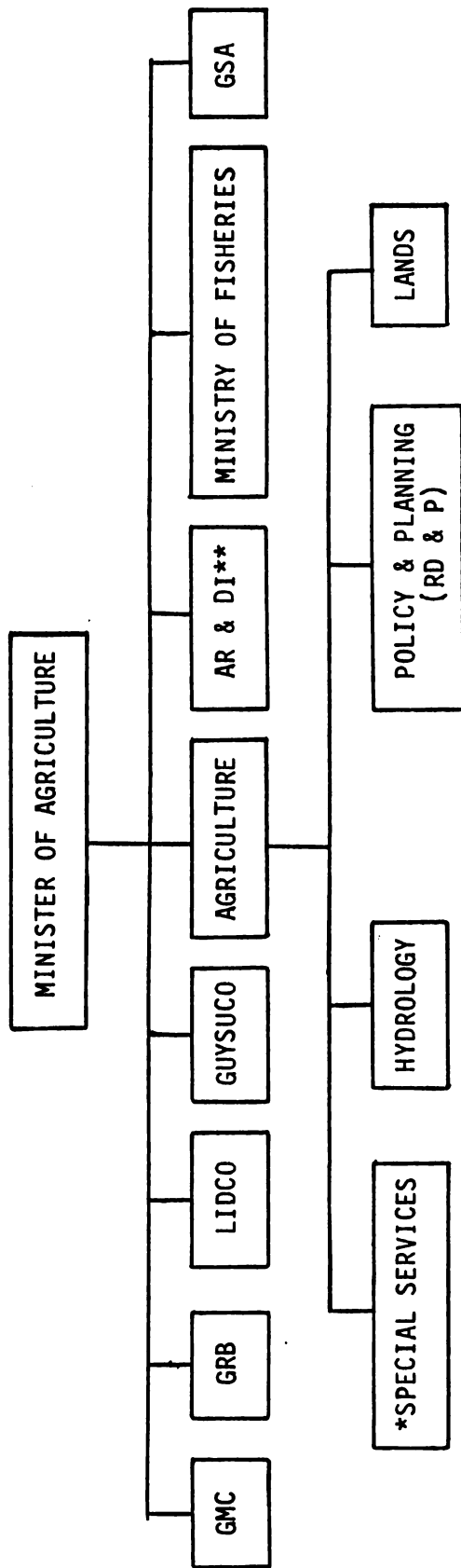
TRADITIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT MODEL



MODERN AGRICULTURAL RESEARCH AND DEVELOPMENT MODEL

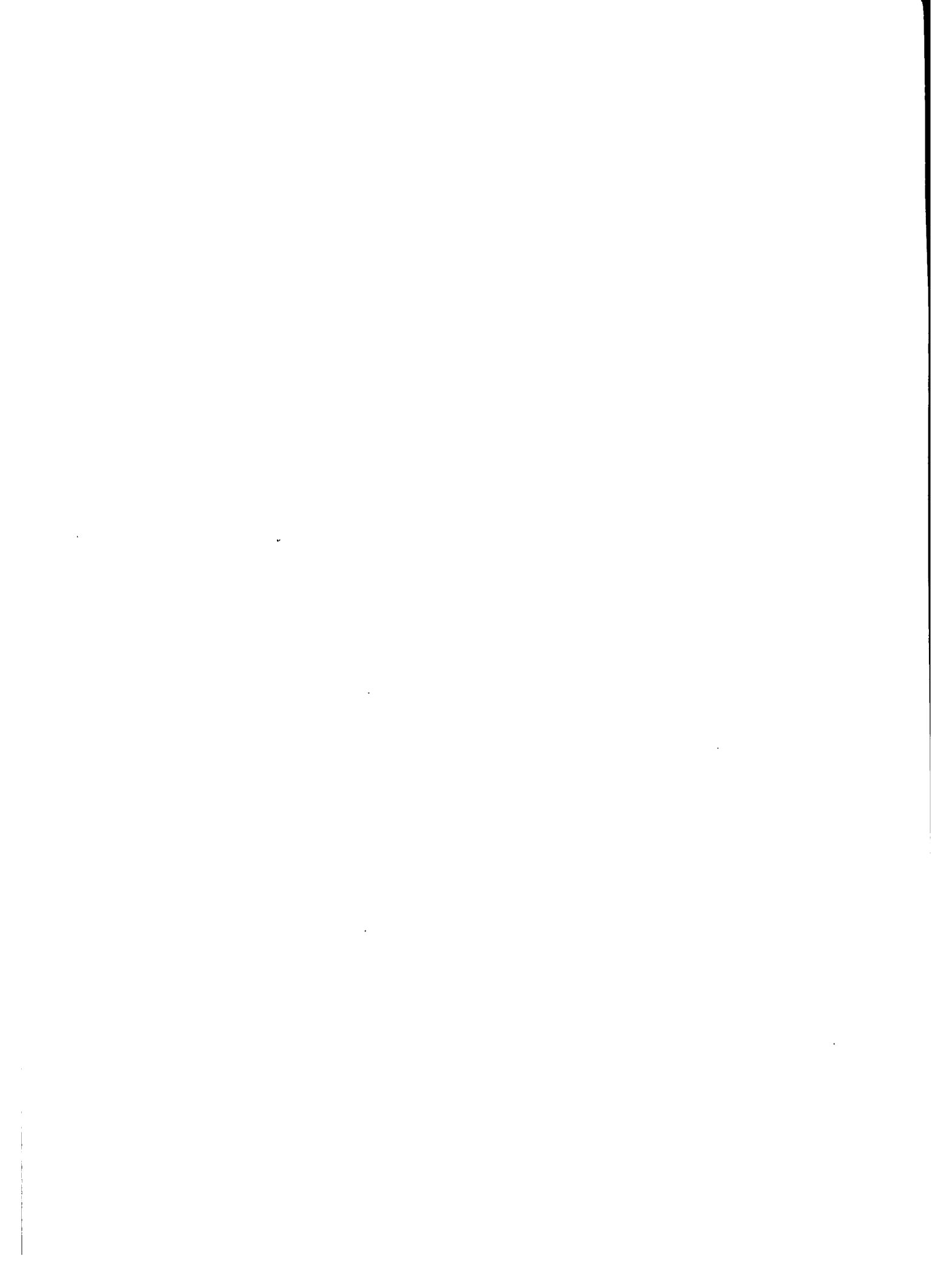


**FIGURE 3: EXISTING MINISTRY RELATIONSHIPS WITH SEMI-AUTONOMOUS AGENCIES AND PROPOSED INSTITUTE**



- \* - PLANT AND ANIMAL QUARANTINE
- PRESERVATION OF WILDLIFE
- PROCUREMENT OF INPUTS (SEEDS)
- LEGISLATION
- AGRO-METEOROLOGY

\*\* - PROPOSED INSTITUTE



The composite, shown in Figure 4, is developed on the basic tenets that:

- an effective and relevant agricultural technology development system is a prerequisite to agricultural development in Guyana;
- technology development is successful only if improved technologies are adopted by farmers. This implies effective diffusion;
- modernization implies a progressive modification of the institutional framework in which technical innovation takes place. It is noted, however, that these modifications are not independent of the broader historical, economic, social and political forces operating in the country.

The proposed system is intended to tackle the shortcomings of the present system and thereby put in place a dynamic and effective technology development and diffusion system which will lead to:

- i) identification, analysis and solution of critical problems faced by Guyanese farmers;
- ii) generation and diffusion of improved soil, crop, livestock and farm management systems; and
- iii) increasing the knowledge and skills of agriculturalists and personnel involved in agricultural production.

#### Functions:

The functions of the Institute would be two-fold:

- Technology Development (Research)
- Technology Diffusion (Extension and Education)

In discharging the function of Technology Development, a greater appreciation of the qualities and characteristics of specific resources as affected by location (region) or composition as relevant will be essential.

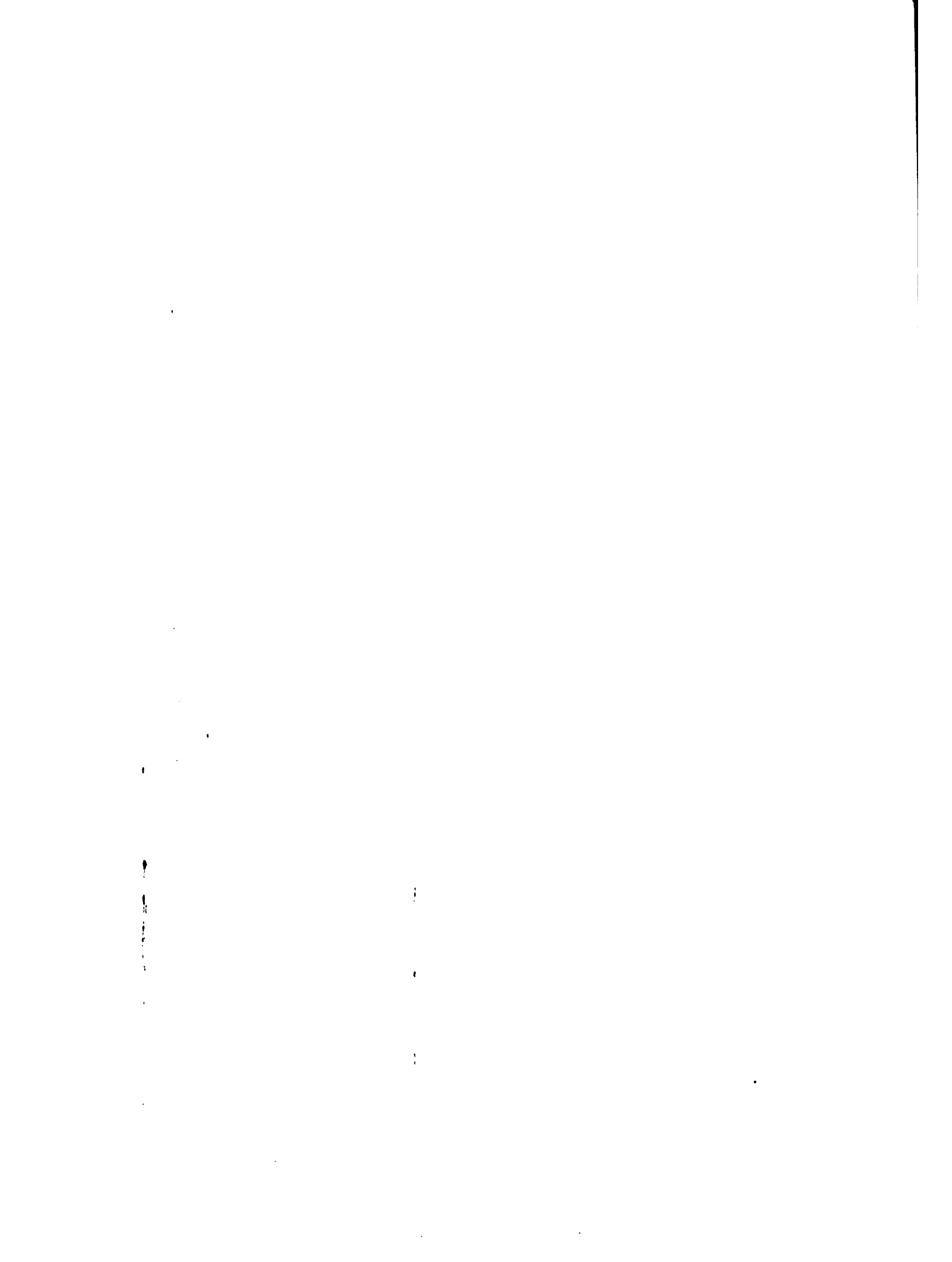
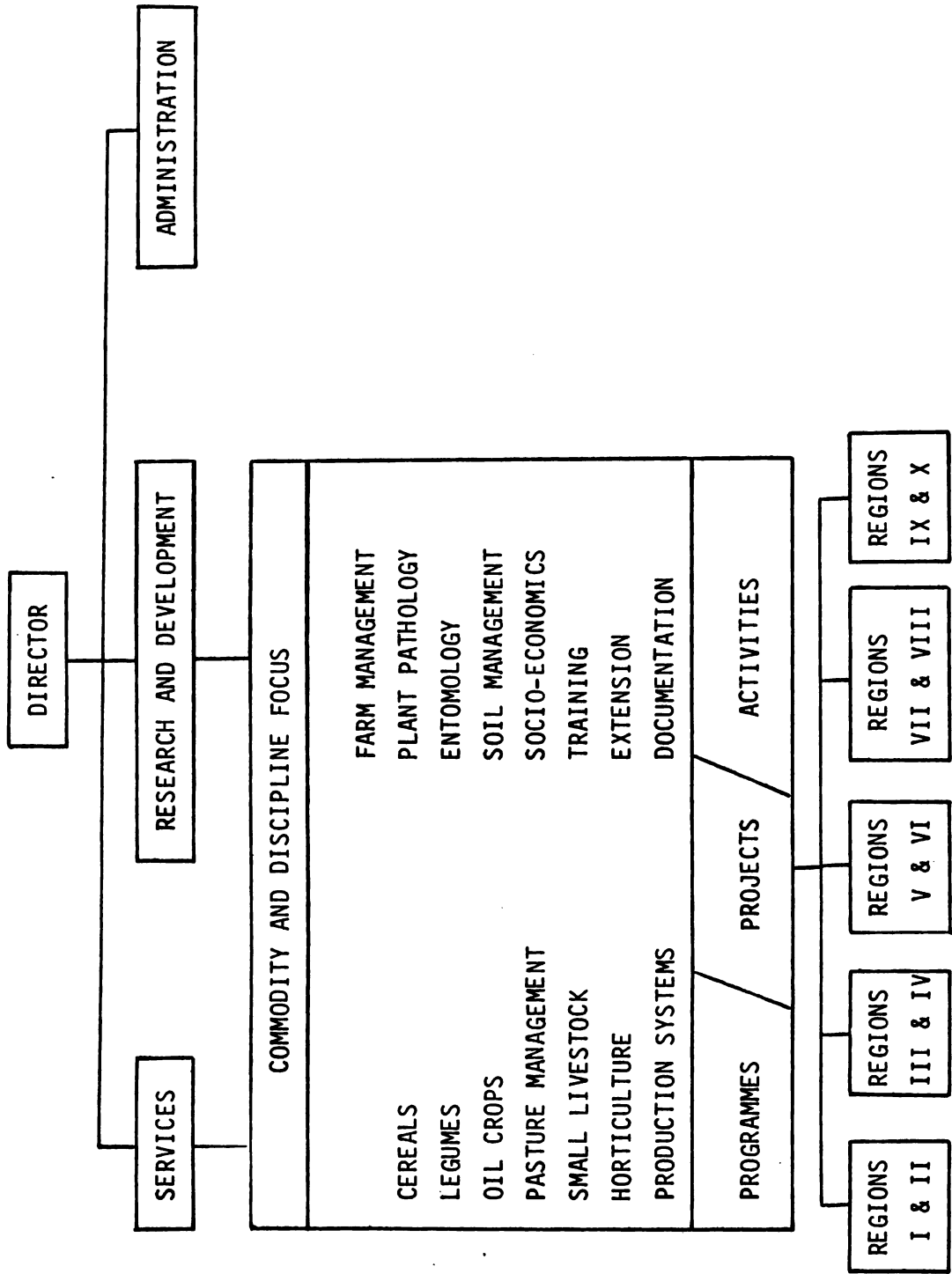
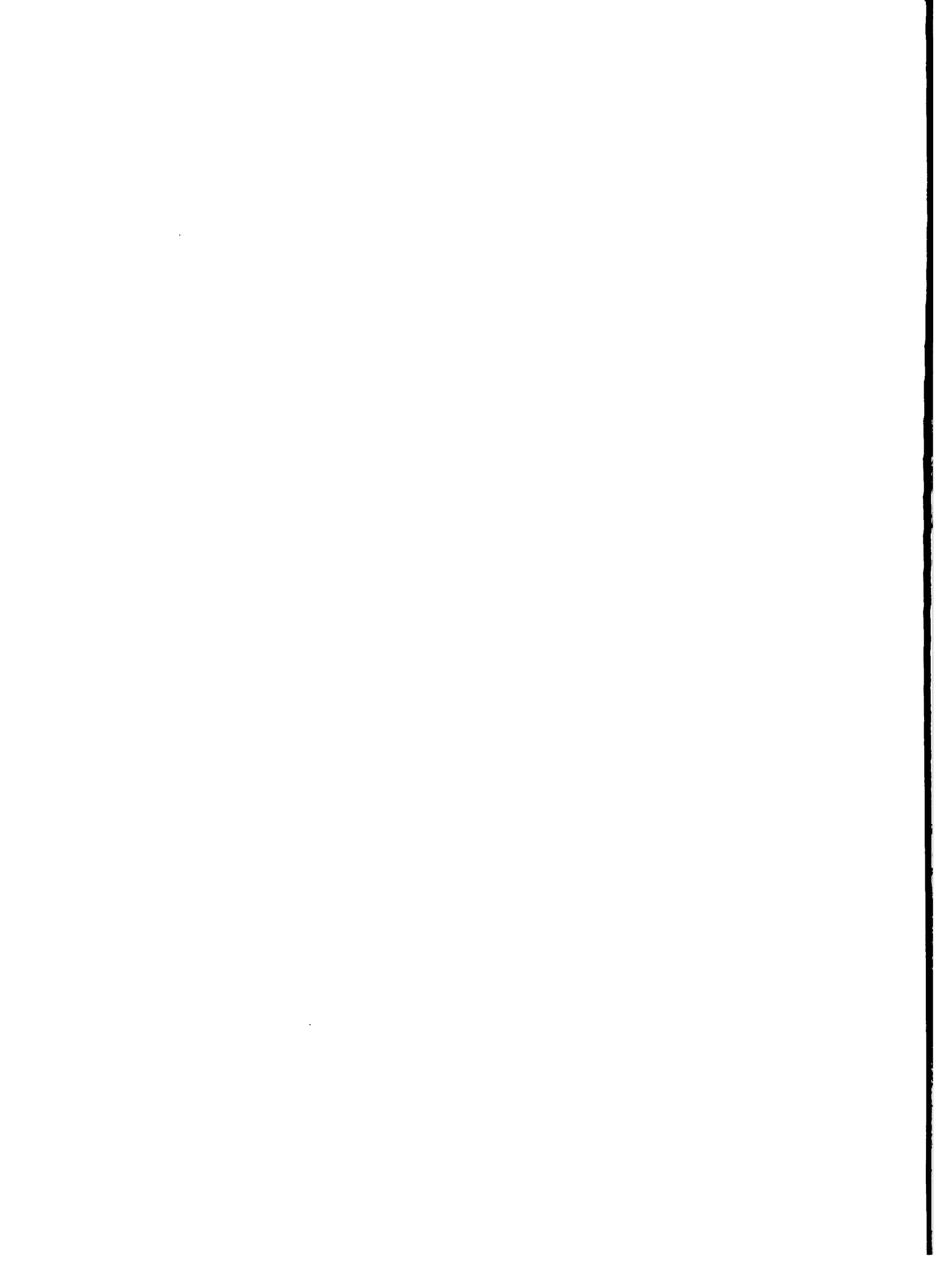




FIGURE 4: ORGANOGAM OF PROPOSED AGRICULTURAL RESEARCH & DEVELOPMENT INSTITUTE





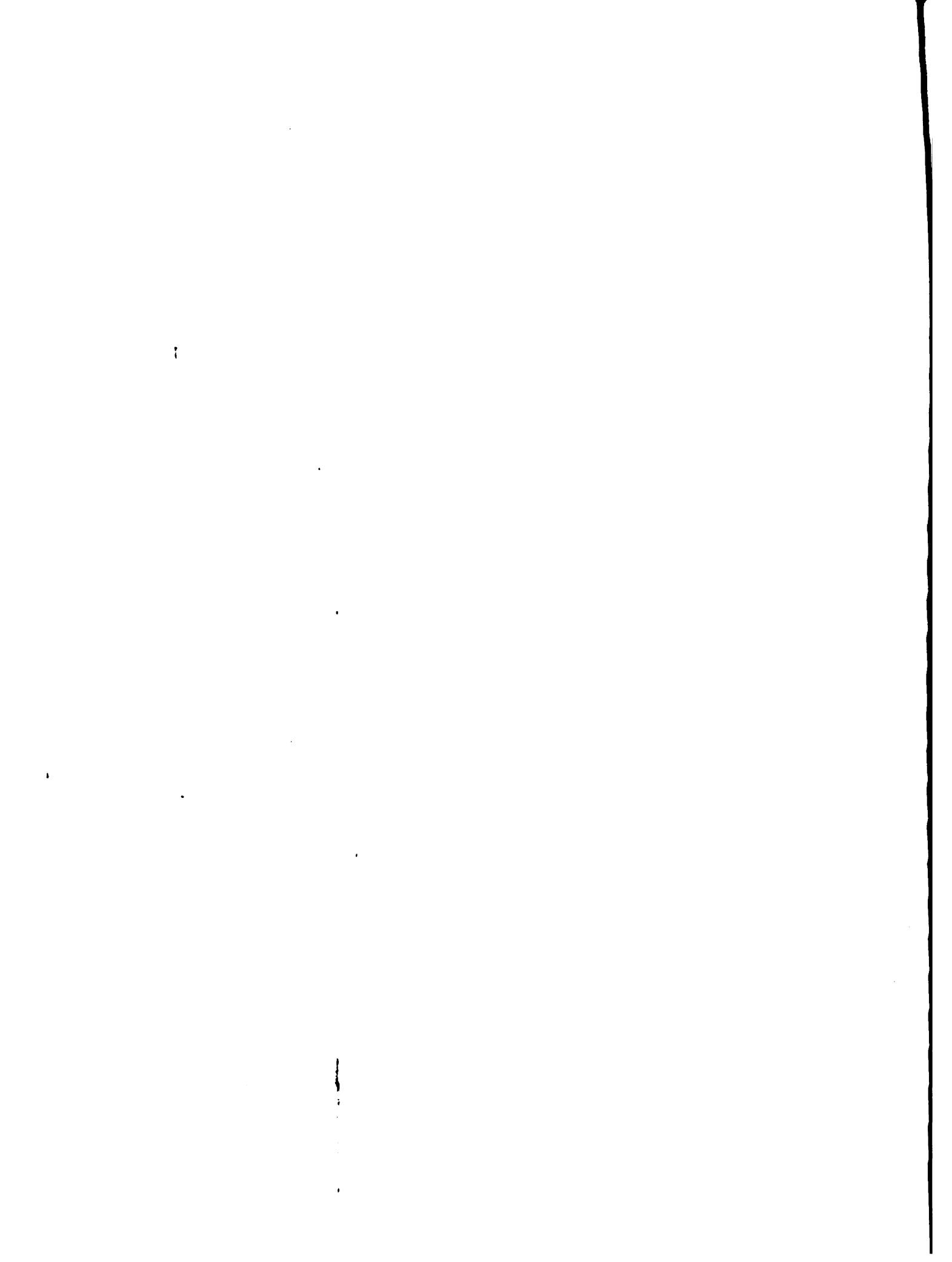
Therefore, activities will be organized on a regional basis. The agricultural profile of the region as determined by its ecological conditions will determine the commodities to be emphasized, e.g. field crops, vegetables, pastures, fruits, etc. The stage of development of the existing technology for production in the region will determine the scope of the work programme and the disciplines to be emphasized, e.g. socio-economic, socio-cultural, managerial, agronomic, etc. Whatever technologies are generated will be validated on farms within the region as a first step in the process of Technology Diffusion.

The function of Technology Diffusion is the more complex but the more urgent. It encompasses both formal and informal education and the clientele will include farmers, extension officers and research personnel. Because of the location-specificity of agricultural technology, it would focus, of necessity in the early stages, on the synthesis of available data into forms useful in the various levels of agricultural education and training. Such synthesis would be the primary means of programming activities for the discharge of the Technology Development Function.

The discharge of the formal education component of the Diffusion process would rely on very close relationships with the Guyana School of Agriculture and the University of Guyana. The subject matter specialists of the Institute should conduct classes in both institutions according to the nature of their appointments and expertise. Further, research activities of the Institute would provide a means of on-the-job training, whether such training is through temporary attachments to the Institute from commodity-producing agencies, or through thesis research by individuals working towards a higher degree.

The inter-relationships obtaining between the two functions as well as the scarcity of suitably prepared and experienced individuals dictate that some staff members of the Institute should be given dual functions, i.e. the job activity of a given post would consist of both research and training components in appropriate proportions.

Professionals employed in this Institute would be hired on the basis



of discipline (social scientist, plant pathologist, agronomist, entomologist, soil scientist, etc.) but job activities would be as dictated by the need of multi-disciplinary teams for project implementation. The multi-disciplinary approach is intended to remove the linkage constraints which are currently experienced between the various specialists who are presently located in isolated units based on discipline. It is believed that the inclusion of a social science <sup>(1)</sup> component in the Institute should go a long way towards increasing the level of awareness and appreciation of the problems associated with adoption of technology by farmers and assist in the formulation of constructive strategies towards the goal of rural development.

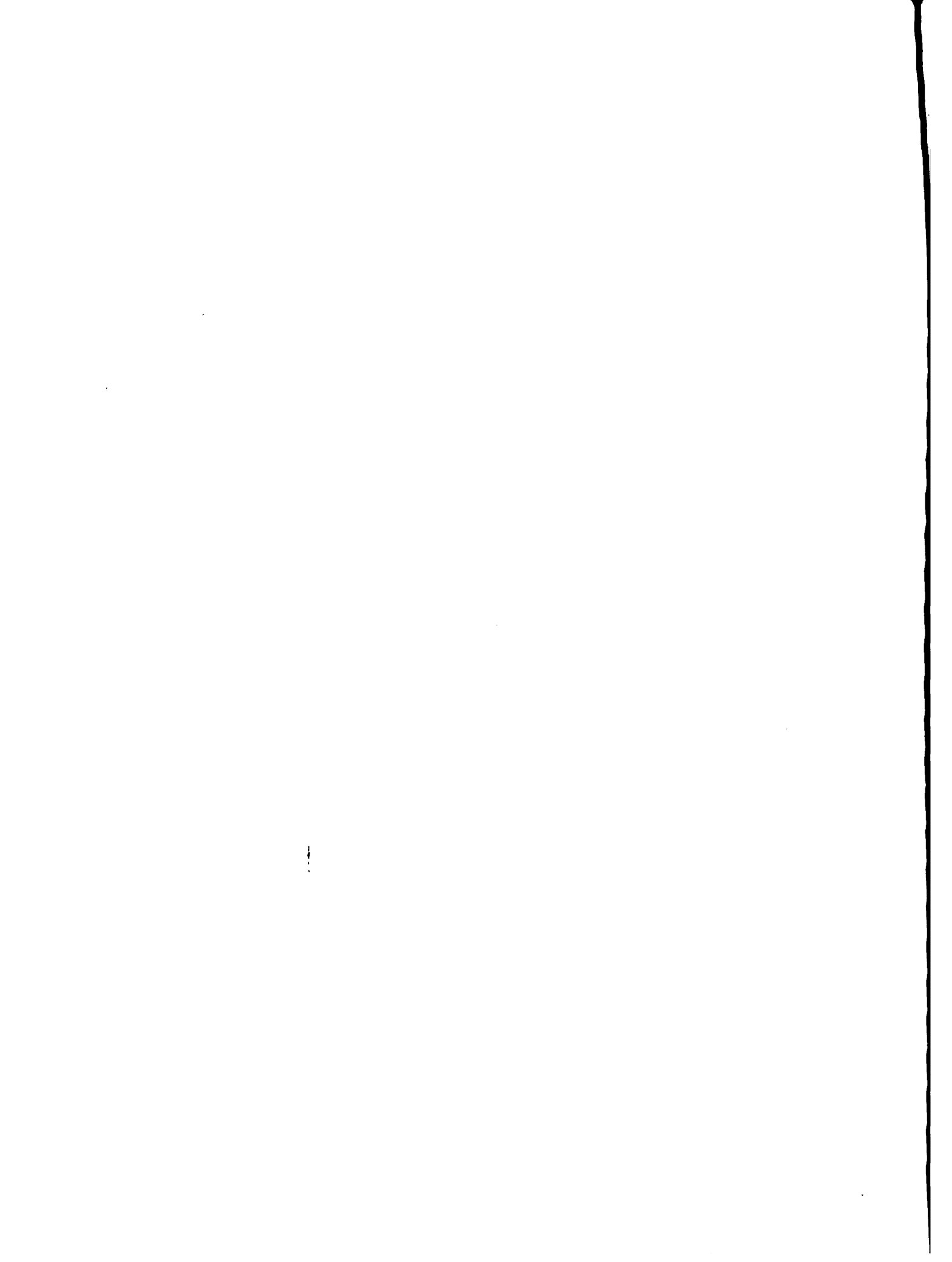
The primary responsibilities of a scientist in the Institute would be to further the growth of the body of knowledge in Guyana within his discipline and to maximize the application of such knowledge to the production process. As earlier indicated, the vehicle by which this responsibility would be discharged would be the "multi-disciplinary Research Team". The teams would include all disciplines required for both the identification and satisfactory solution of specific problems in well defined projects.

This approach is intended to accelerate the growth of a body of adequately prepared scientists and technologists in a relatively short period, provide intellectual stimulus and job satisfaction to the staff, and provide an easy mechanism for evaluation.

The process of problem solving will rely heavily on the farmer. In the process, farmers' fields will be utilized as demonstration and verification plots and the farmer himself, directly or through his commodity organization or co-operative, will be an agent of diffusion of the technology generated.

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(1) It should be noted that economists and other social scientists in the Institute will not duplicate the work of professionals now employed in the Resource Development and Planning Unit as the latter's main focus would continue to be the analysis of data and observation of trends for policy making (largely macro-economics) while the work of the former would be mainly production economics and farm management (largely micro-economics).



Presently, the farmer is left out of the technology development system. His main contact with the agricultural administration is through the field extension officer, but the linkages between the field extension officer and the research system are virtually non-existent. Further, the present system does not have a teaching, farmer field trial network that is regionally oriented.

The proposed system seeks to incorporate the farmer and his views at several levels. It is suggested that an Agricultural Development Committee be established in each Region consisting of a number of farmers' representatives of the Region including the Agricultural Extension Officer and the Institute's local Agricultural Development Officer to identify production constraints which require research inputs and to suggest priorities for action. Figure 5 gives an indication of what is envisaged.

The Institute also should interface with other national science and technology entities, e.g. University of Guyana, Institute of Applied Science and Technology, National Science Research Council, and with the international agencies and Research Institutes (CIAT, IITA, AVRDC, IRRI, etc.) involved in agricultural research and development.

#### Management:

The four units currently comprising the technology development system are within the public service, forming part of the Ministry of Agriculture, but in this proposal the Institute would be under the Minister of Agriculture within the Ministerial system, but outside of the public service system. This would give the Institute a somewhat similar status to semi-autonomous entities such as the GSA (a corporation), LIDCO (a company), etc. and a degree of management flexibility which is essential.

The Minister of Agriculture has ultimate responsibility for the affairs of the Institute. The Minister would appoint the Board of Directors, the Chairman and the Deputy Chairman of the Board. The Board would be directly

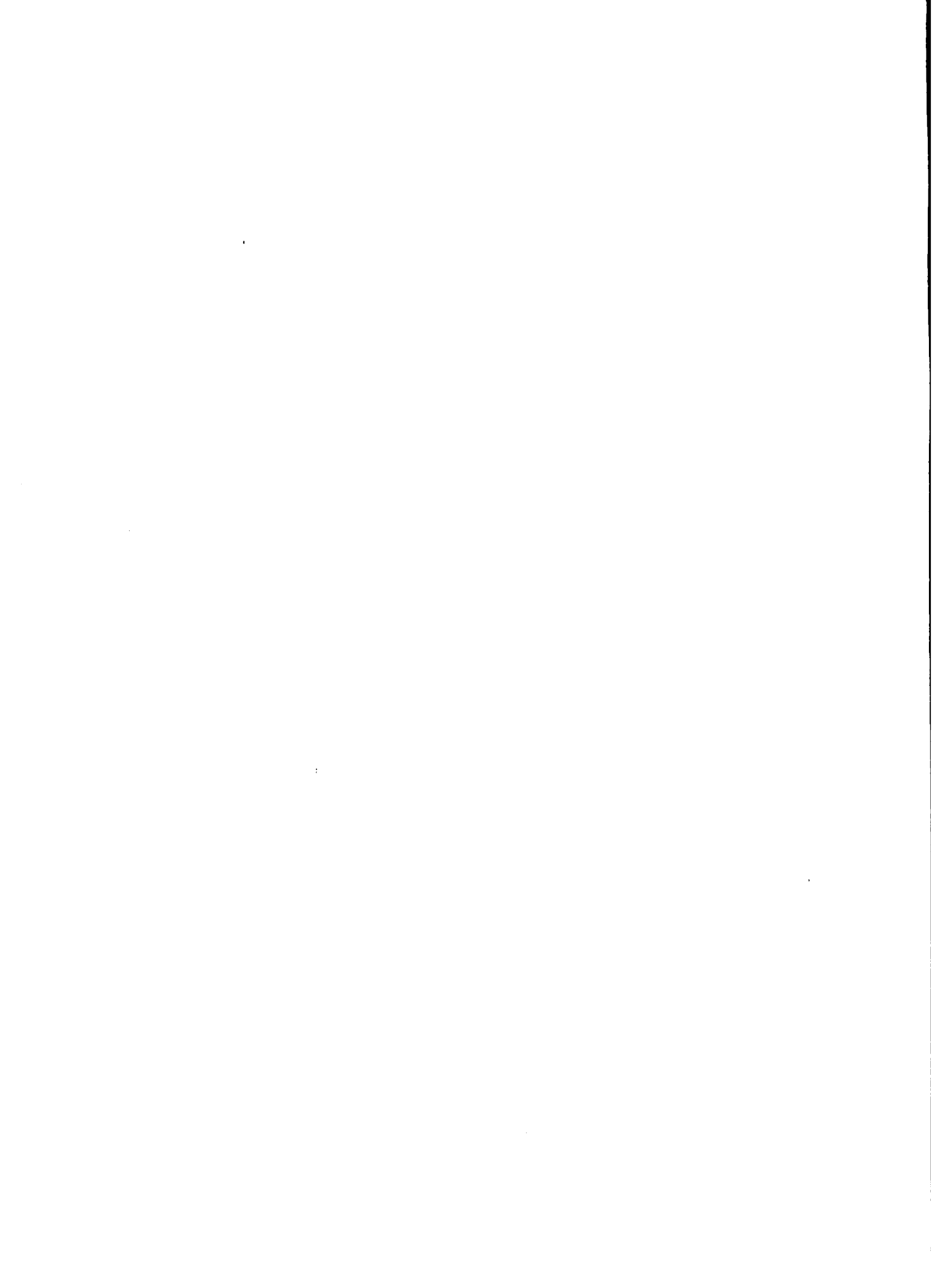
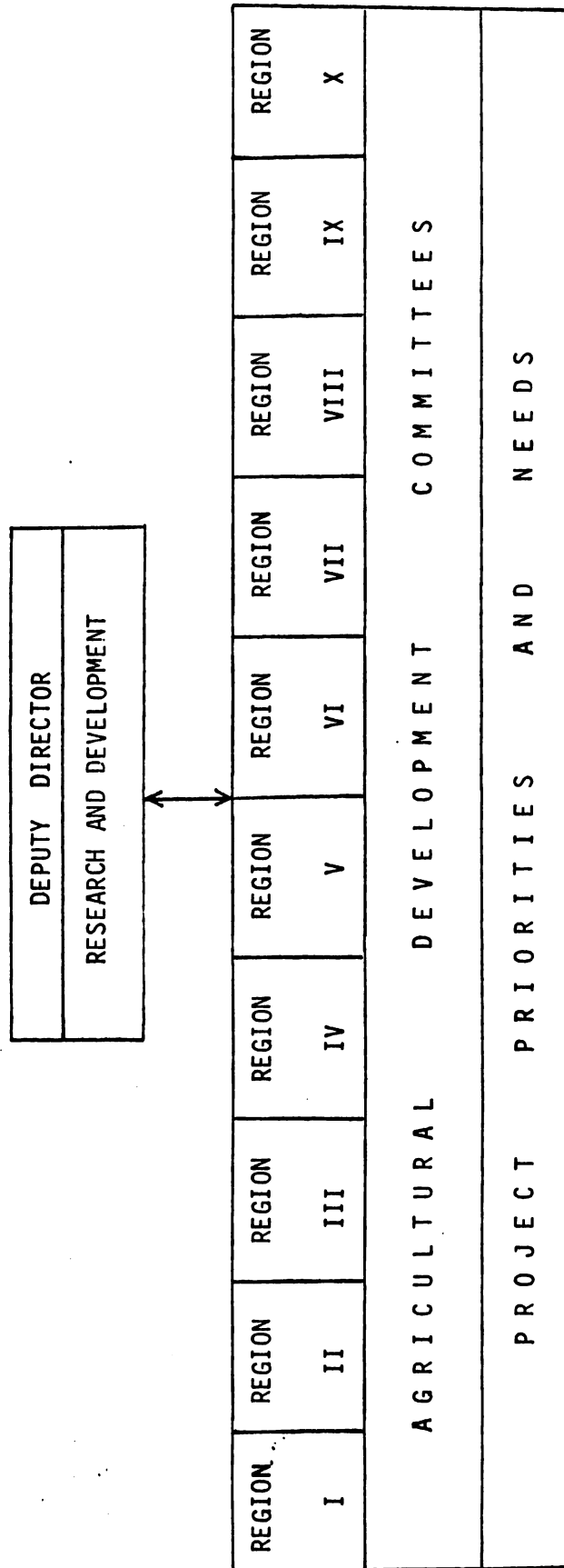
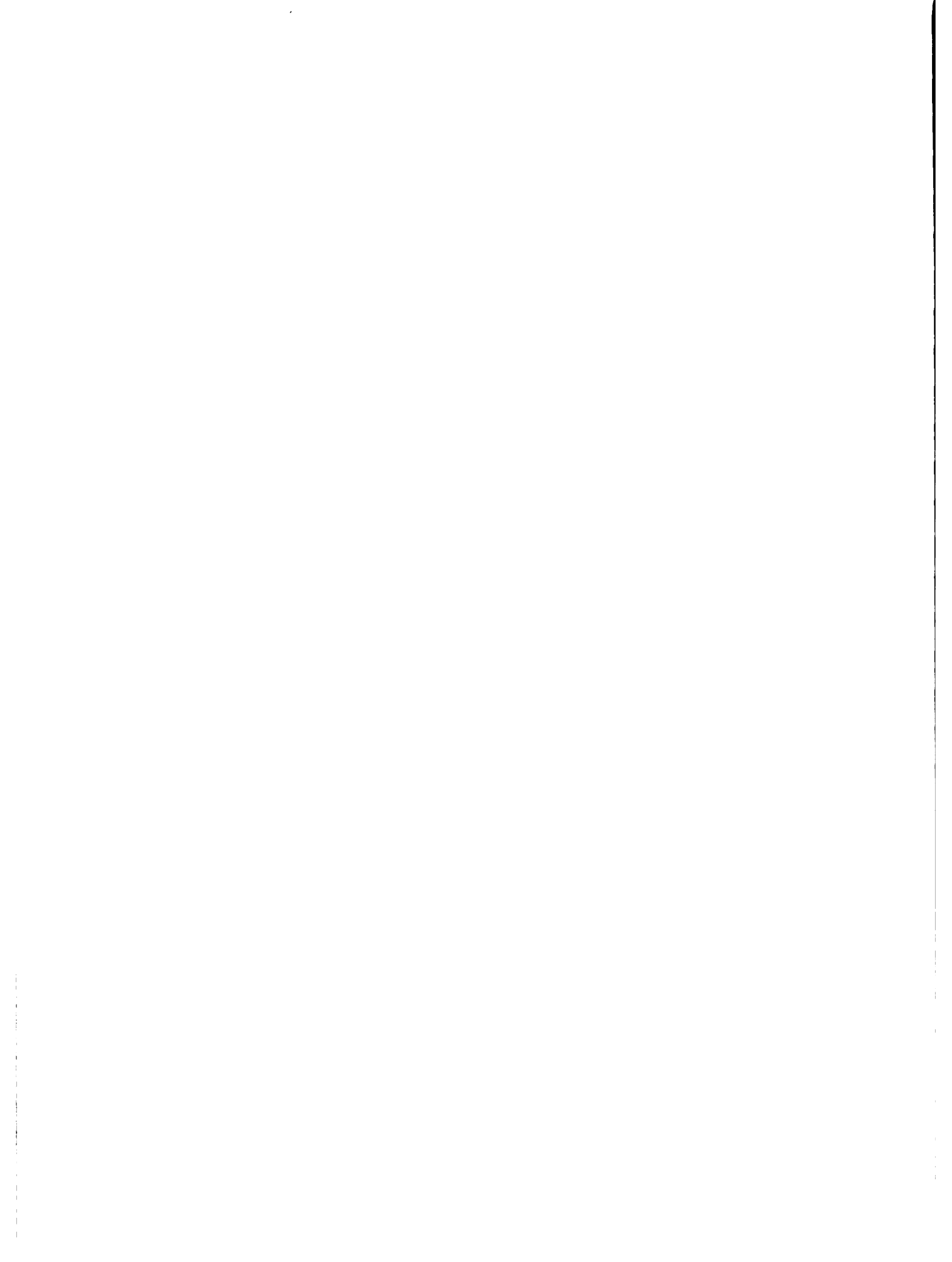




FIGURE 5: COMMUNICATION LINKAGES BETWEEN REGIONS AND INSTITUTE





responsible for the formulation of policy and the general administration of the Institute consonant with national policies for the agricultural sector. The Board should consist of a number of Directors representing at least the agencies indicated below, together with the Director of the Institute:

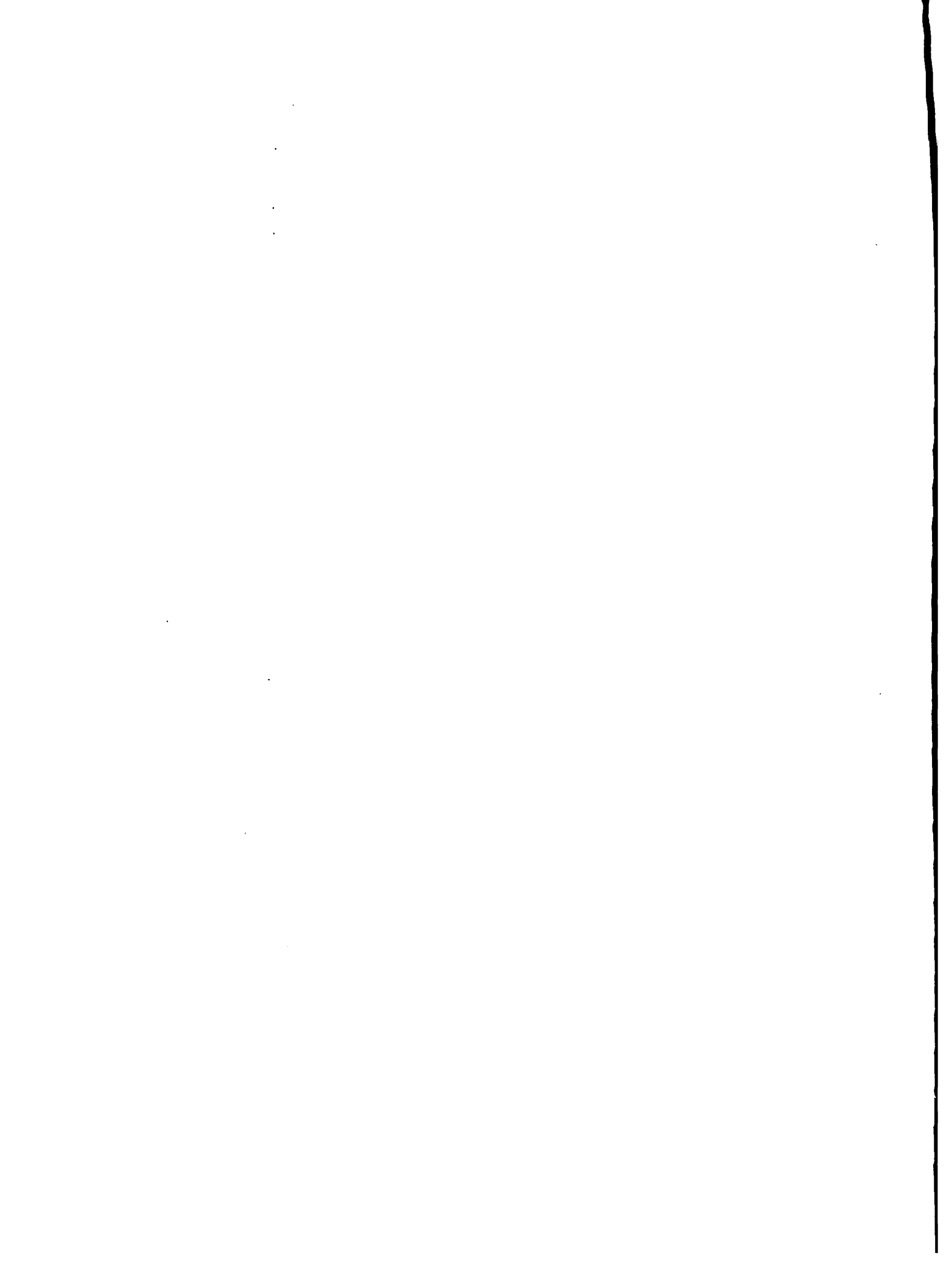
- One representative of the Agricultural Development Committee from each region - (10)
- Two representatives from the Ministry of Agriculture, one of whom should be from the Resource Development and Planning Section - (2)
- One representative each from LIDCO, GRB, GSA, UG (Faculty of Agriculture) - (4)
- One representative from the agro-industrial sector - (1).

Any other areas considered relevant for representation could be included through appointment by the Minister.

The Board, with the approval of the Minister, would appoint a Director who will be the chief executive of the Institute with responsibility for its successful management, both from the standpoint of administrative control and general supervision of the work programme in keeping with the policies and goals of the Institute. The Director will be directly supported and advised by the heads of the three divisions - Administration, Research and Development, and Services.

The Institute will develop routine processes of evaluation from the aspects of accountability, improvement of methodology, documentation and communication but it should be noted that the multi-disciplinary project team approach in itself provides a reasonable evaluation and output-stimulating mechanism.

Linkage of Institute with the Regional System and Farmers: As envisaged, the linkage of the Institute with the Regional System of Administration and farmers



would occur through:

- The Board of Directors
- The Agricultural Development Committee, and
- Agricultural Extension Officer/Agricultural Development Officer collaboration.

At the present time, the operation of the Regional system is not well defined but it is assumed that the Region will have administrative responsibility for Regional staff of the Public Service, including the Agricultural Extension Officers. Assuming that this is correct, the lines of responsibility and major areas of activity envisaged are shown in Figure 6.

It should be noted here that although the Institute will have an extension (diffusion) function, it is not expected to exercise control over all extension staff. The majority of extension personnel are expected either to remain within the Ministry of Agriculture, possibly in the Special Services Division or revert to the Regional administration.

#### ANTICIPATED BENEFITS/IMPACT

Several benefits are likely to accrue from the implementation of the proposed system, among which are the following:

- increased output of relevant and appropriate technology owing to better management of research;
- increased level of farmer utilization of technology generated because of greater farmer involvement in the process;
- development of a more stable cadre of professionals in the service of agriculture; and
- increased financial resources for project implementation.

One of the limiting factors in the present system is the rapid turn

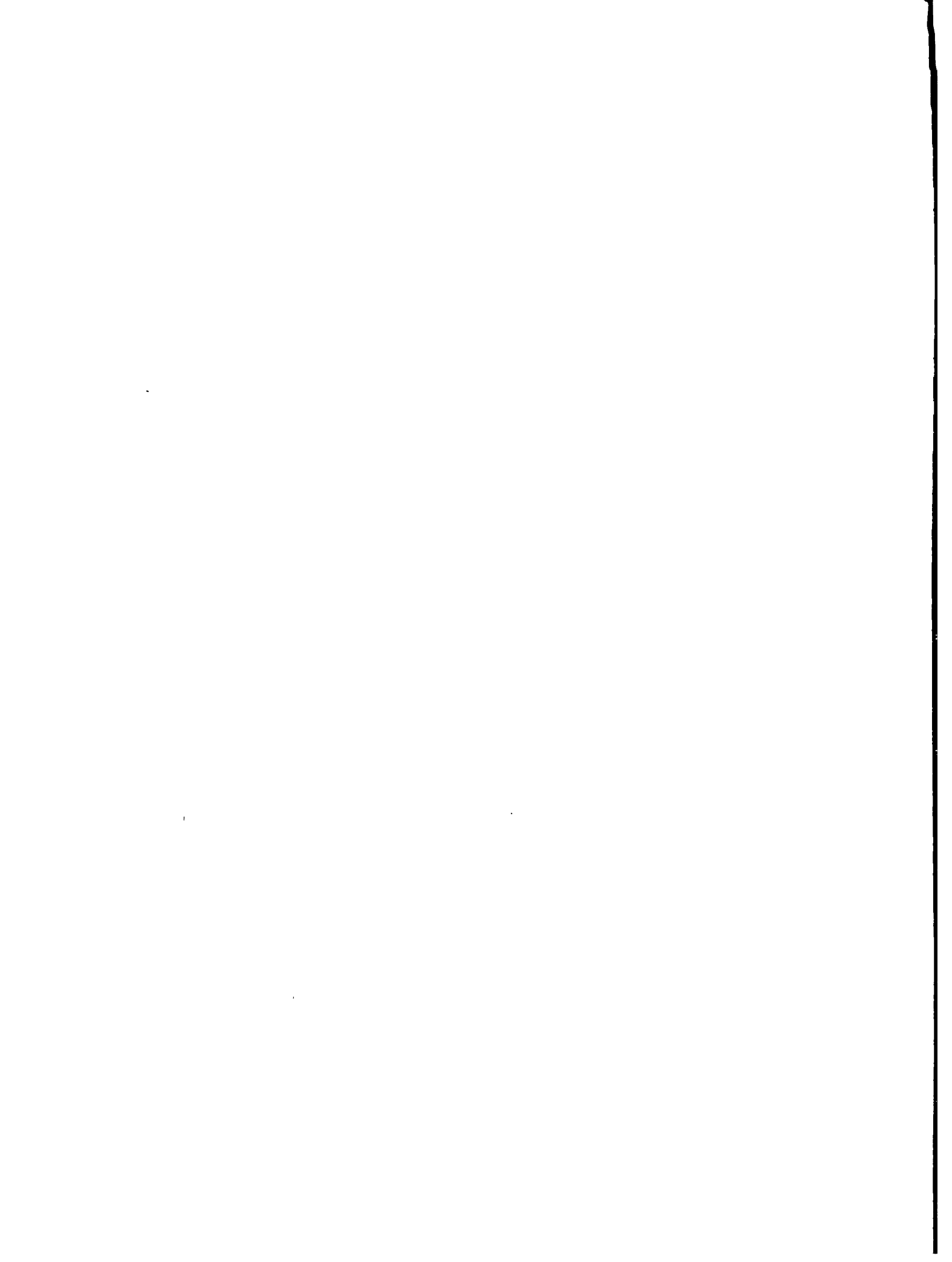
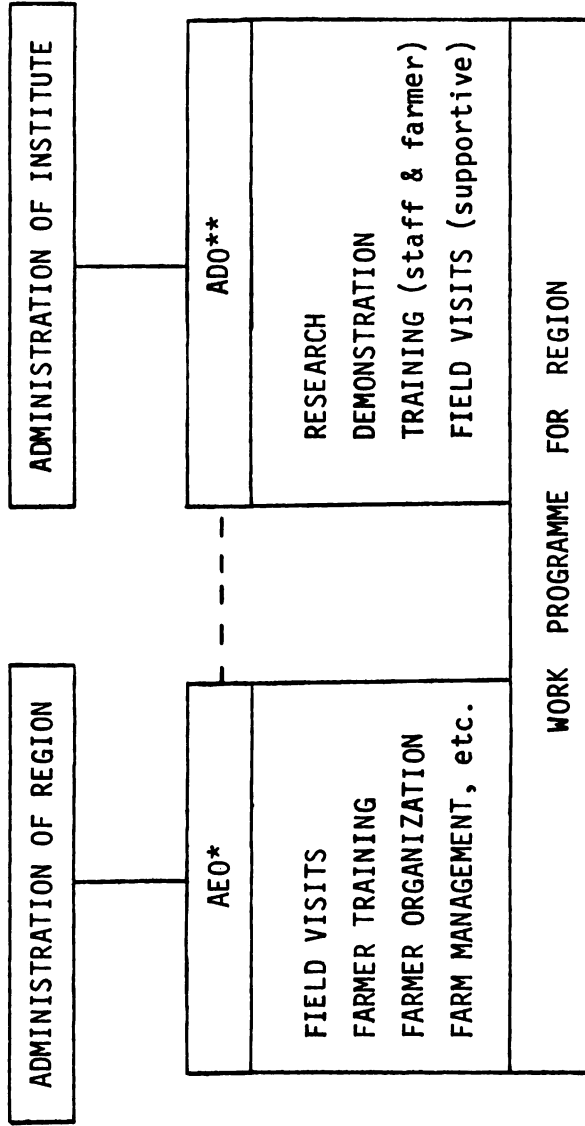
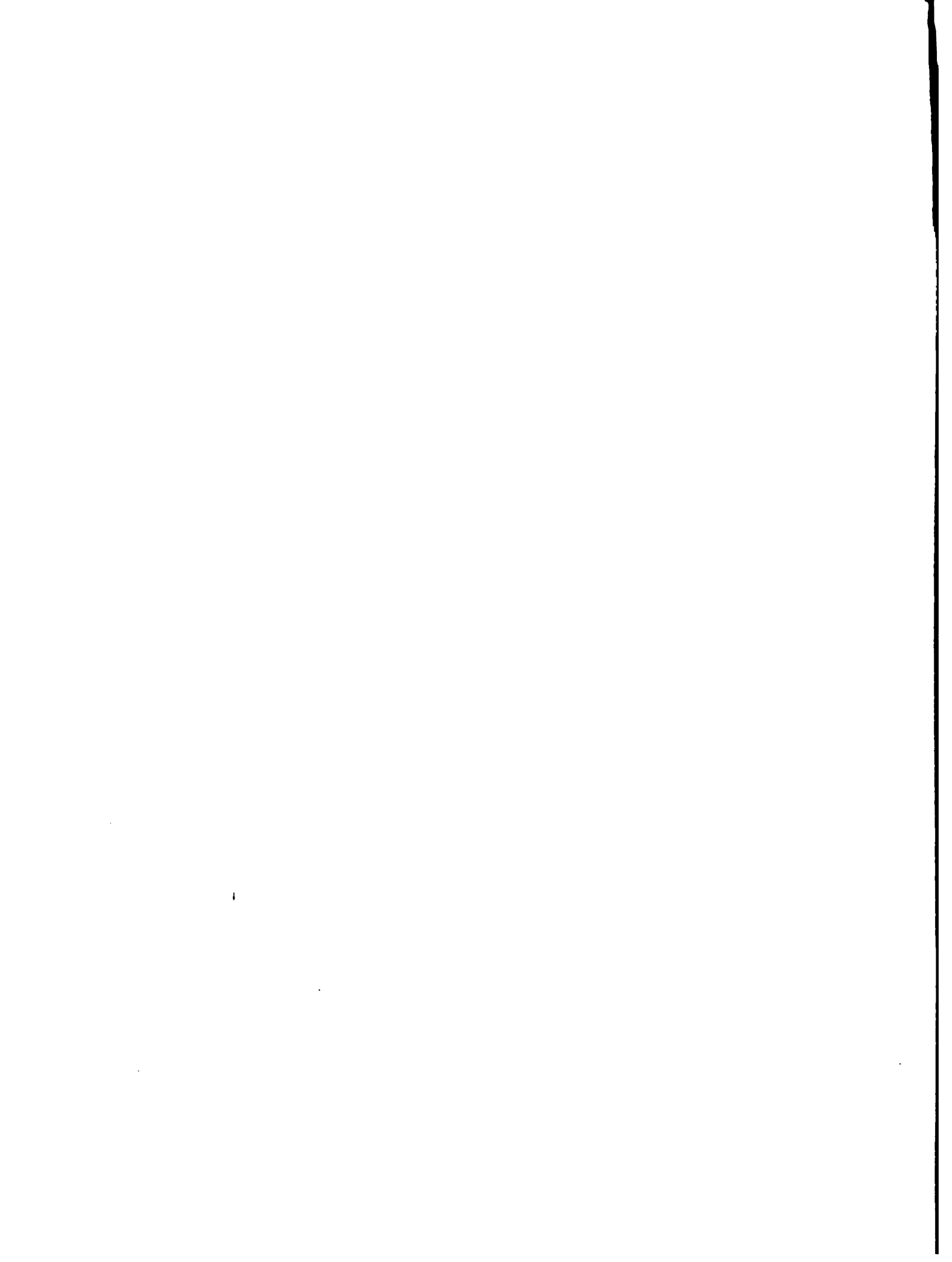


FIGURE 6: LINES OF RESPONSIBILITY AND COLLABORATION BETWEEN EXTENSION AND RESEARCH



\* Agricultural Extension Officer

\*\* Agricultural Development Officer





over of professional staff. Although there are several reasons for this, among the more important are lack of job satisfaction, poor remuneration and the limited possibilities of personal advancement in technical positions, the net result of the latter being the movement of technical personnel either to administrative positions or elsewhere.

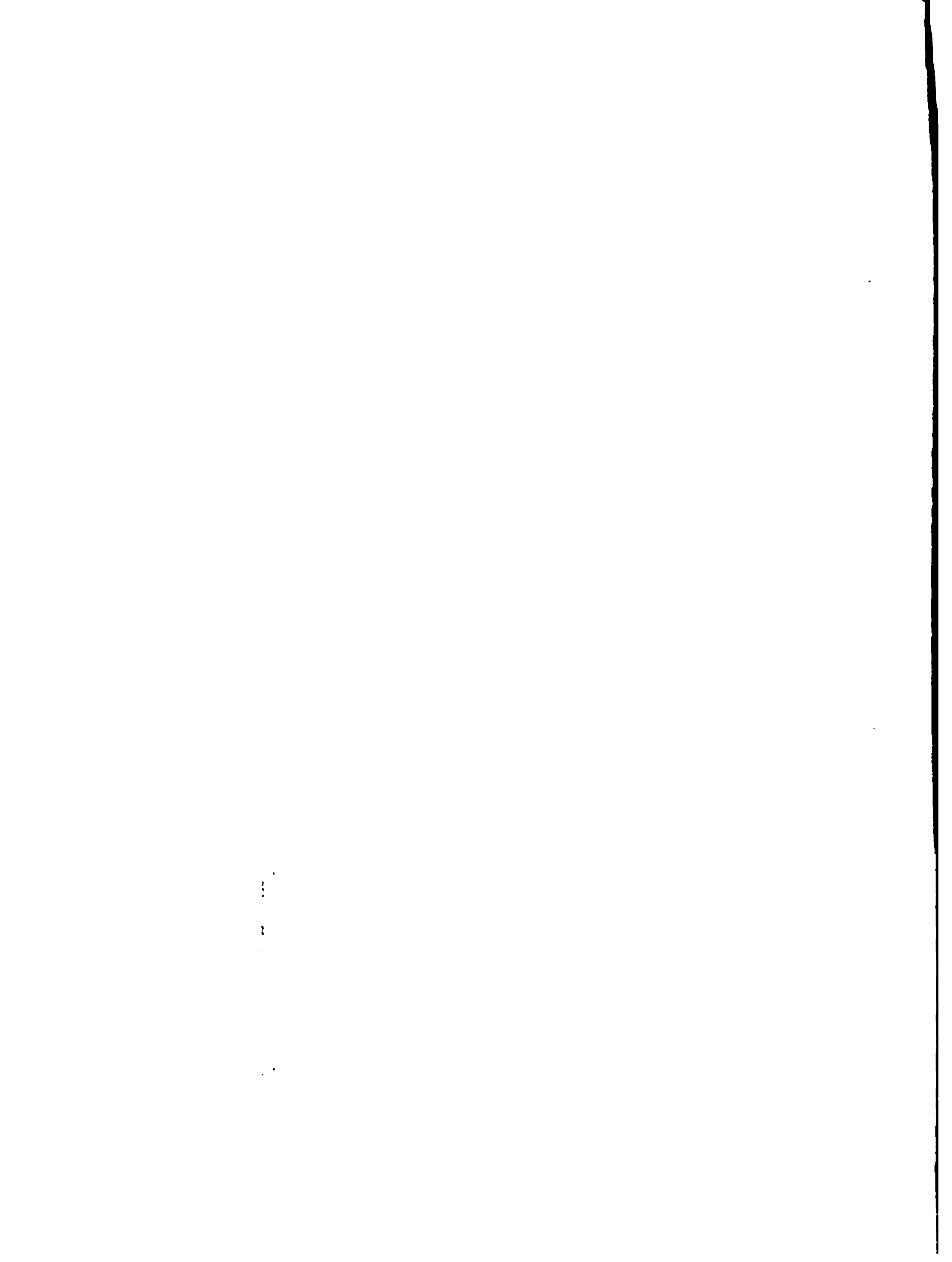
It is anticipated that an institute of this nature would provide a better 'climate' for research and development and thus increase the job satisfaction of personnel involved. In fact, fewer Guyanese professionals are likely to leave and more are likely to return to join an institute such as this.

With regard to remuneration, we are not in a position to suggest levels, but it is envisaged that somewhat higher levels would be justifiable on the basis of expected increased output and a more obvious beneficial effect on the productive sector. It is also suggested that the Institute adopt a strategy which will permit advancement of a professional within his technical area of competence in a graded system - Grades I, II, III, IV and V - somewhat along the lines of the current system (A 24, 27, 31, 33, 36, etc.) but with uniform nomenclature, for example Agricultural Development Officer.

With regard to financial resources, it is felt that the proposed institute will be looked upon more favourably both by funding agencies and local government. The possible sources of funding are likely to include government subventions, grants from international agencies, internal contracts (GRB, GUYSUCO, LIDCO, etc.), and special advisory and consultative services to agencies involved in agriculture and related fields.

The Institute, in addition to impacting positively on the development of human resources and on the generation and diffusion of agricultural technology, will contribute to the enhanced productivity of the physical resources of the country. This would accrue from the pursuit of the research function in terms of characterization of natural resources and definition of the optimum means of utilization.

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For success, it is essential that tangible efforts be made within the Institute to ensure:

- good communication flow along well defined lines
- efficient use of manpower and resources
- elimination of routine work by researchers
- creation of a 'climate of colleagues' through the interdisciplinary approach to project implementation and elimination or reduction of the problems of co-ordination across disciplines
- better mechanism for monitoring and evaluation of activities
- adequate provision to facilitate interaction of its professional staff with their colleagues both locally and internationally.

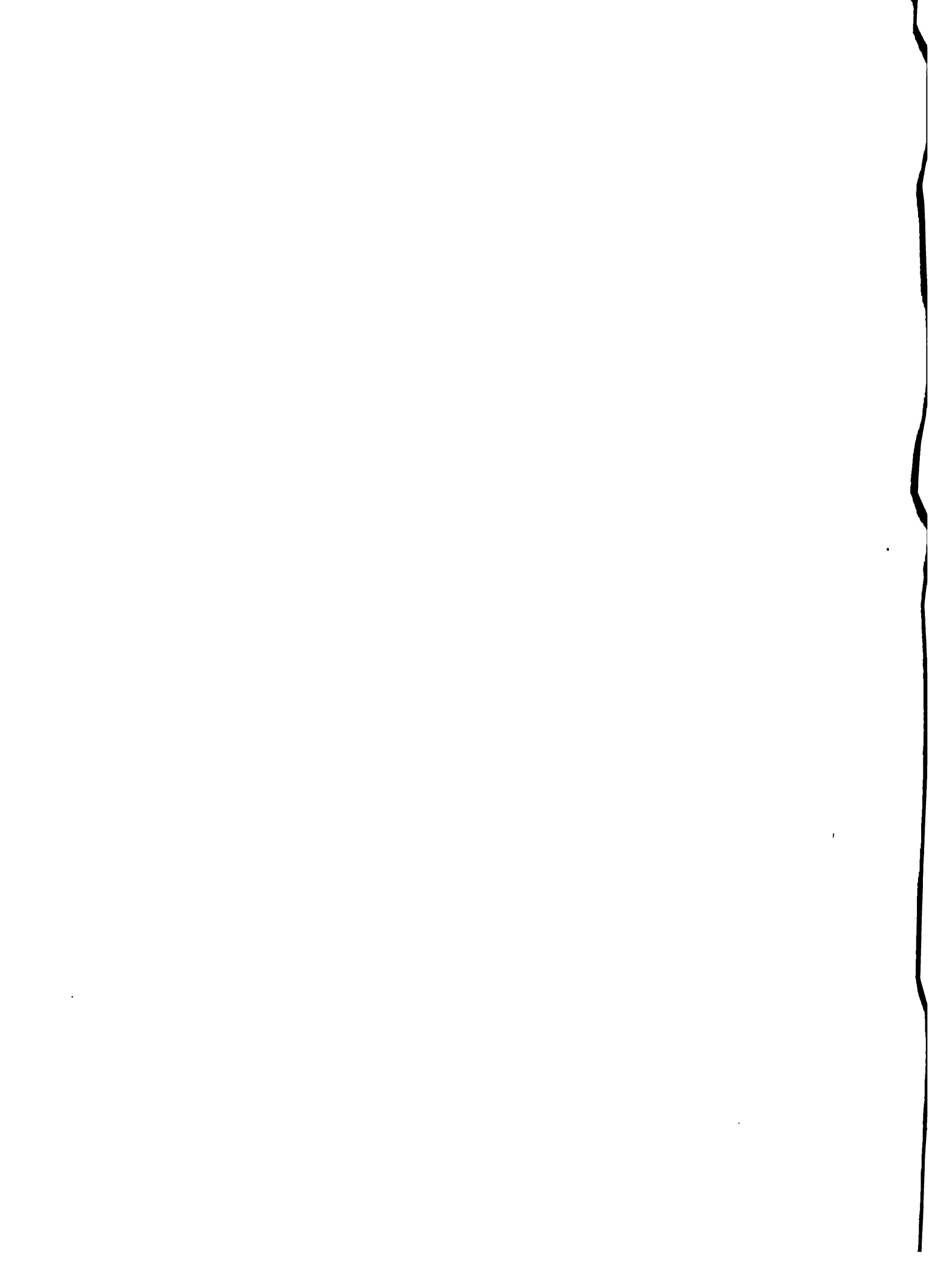
Undoubtedly, out of these measures agricultural development in the country will be greatly advanced.

#### TRANSITION PERIOD

The proposals put forward here emphasize the need for change and have been made because of the fact that this need is accepted as a "conditio sine qua non" for national development. How this change will be effected and the time frame over which it will take place is not easily determined or described. However, it is readily appreciated that there will be a period of transition from the existing to the desired.

Should the conceptual framework be accepted, the key actions during this transition period would include the following:

- i) Preparation for the process of change - the assembling of human resources which would be responsible for further developing the basic aspects of the proposal.
- ii) Informative work so as to ensure clarity of concepts and operations being introduced. Much work at the national, regional and farmer level would need to be done.

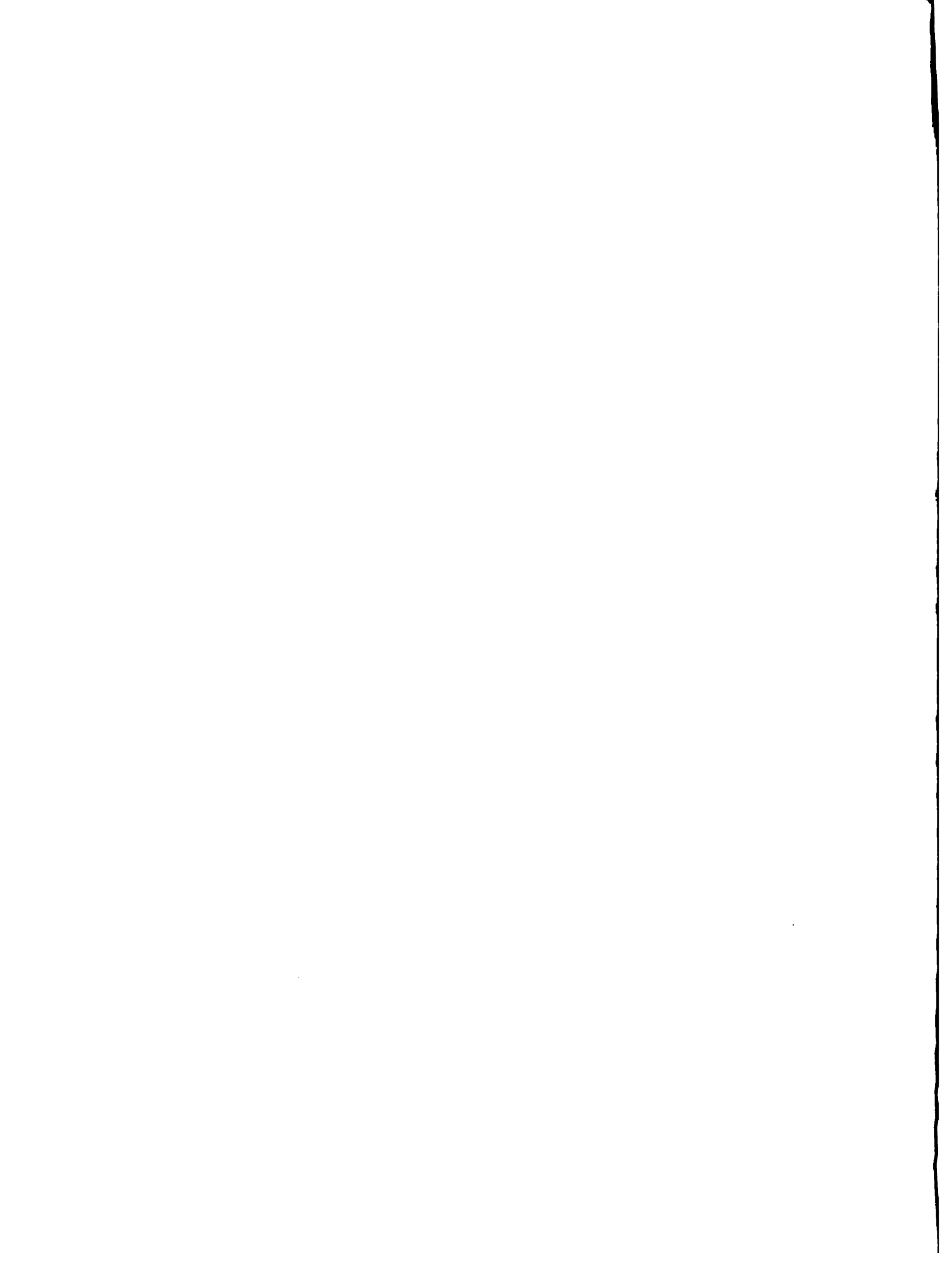


- iii) Investigation into allocation and re-allocation of present resources so as to conform to the new roles and dimensions of the proposed Institute.
- iv) Efforts to obtain financial and technical support for the establishment of the institution.

Left to its own devices, nature effects changes which in their totality are described as the process of evolution. If the direction of change and the time frame over which such change is spread is to influenced, human intervention in the evolutionary process must take place. Agricultural development in Guyana now requires such intervention.

#### CONCLUSIONS

The changes proposed are considered to be critical to strengthening the Country's ability to generate and diffuse agricultural technology. The proposals urge the creation of an institutional structure and system which is highly integrated and which ties efforts in agricultural science more closely to the farm and farmer problems.



## Appendix 1

Recommendations and Conclusions from 1974 Seminar  
entitled: Farmer/Research/Extension Link Seminar

### SEMINAR RECOMMENDATIONS AND CONCLUSIONS

The participants of the Seminar felt that:

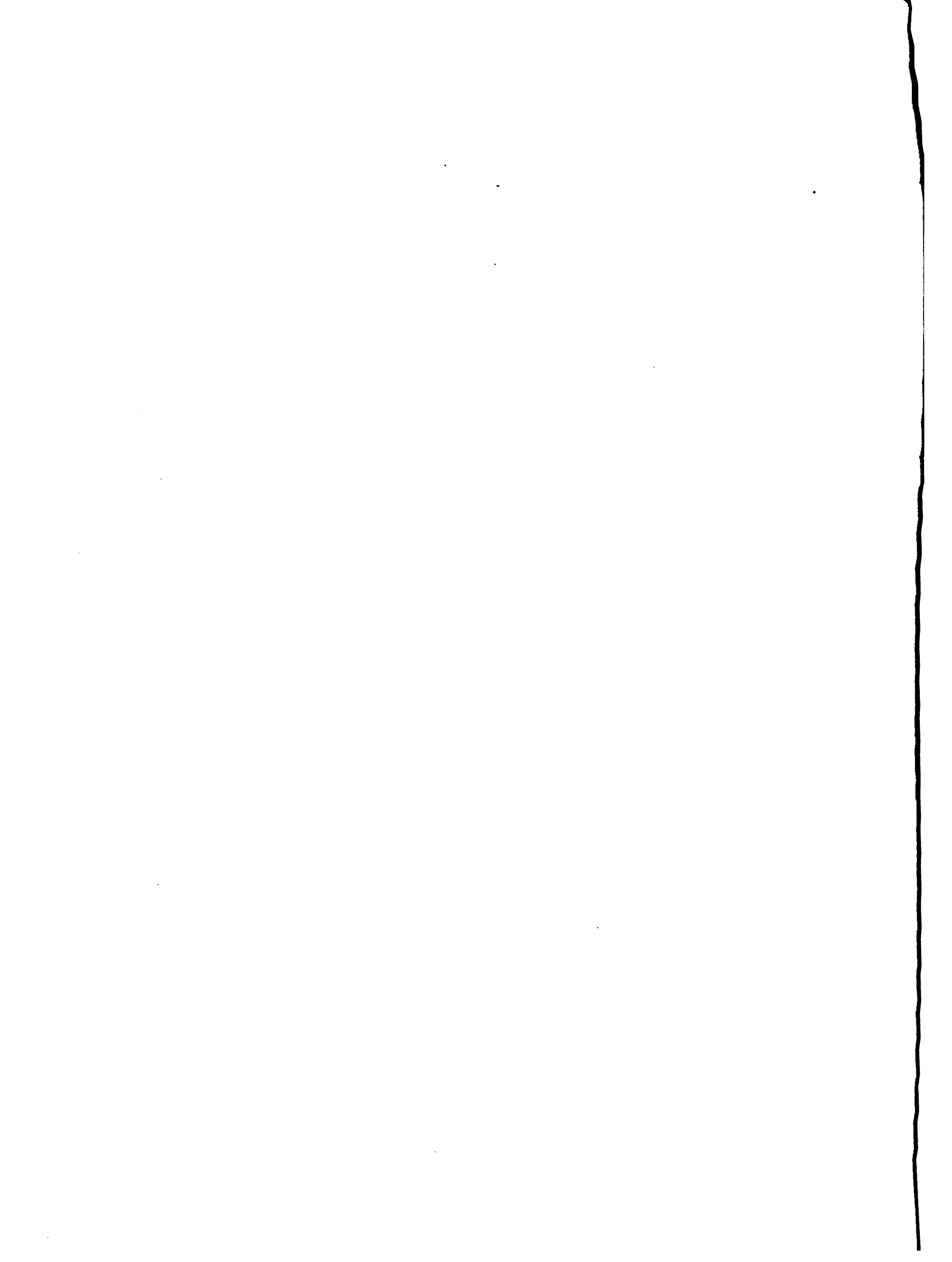
#### In-Service Training

1. Extension Officers should attend research seminars. For the benefit of officers in outlying districts, papers presented, including questions and answers, should be posted to them.
2. Officers working on special crops should initiate meetings with the agriculture staff from each district where the crops are being grown. At any rate, some collaboration between research and extension should be aimed at educating field staff at monthly meetings or training sessions.
3. Seminars should also originate from the Extension Section, for the research division. An alternative could be sending reports to the research staff on extension techniques and progress.

#### Functional Professional Association

1. An interchange of future staff, between Extension and Research, should be considered. Serving periods in both sections would widen outlook and understanding, and integrate staff.
2. Subject matter officers should work very closely with the officers in extension. Special emphasis should be placed on demonstration plots, where joint involvement augurs well for the best, and commercial plots where collaboration is essential for success.
3. Feed back in the form of factual, timely reports should be made available to research officers by extension officers and vice versa.

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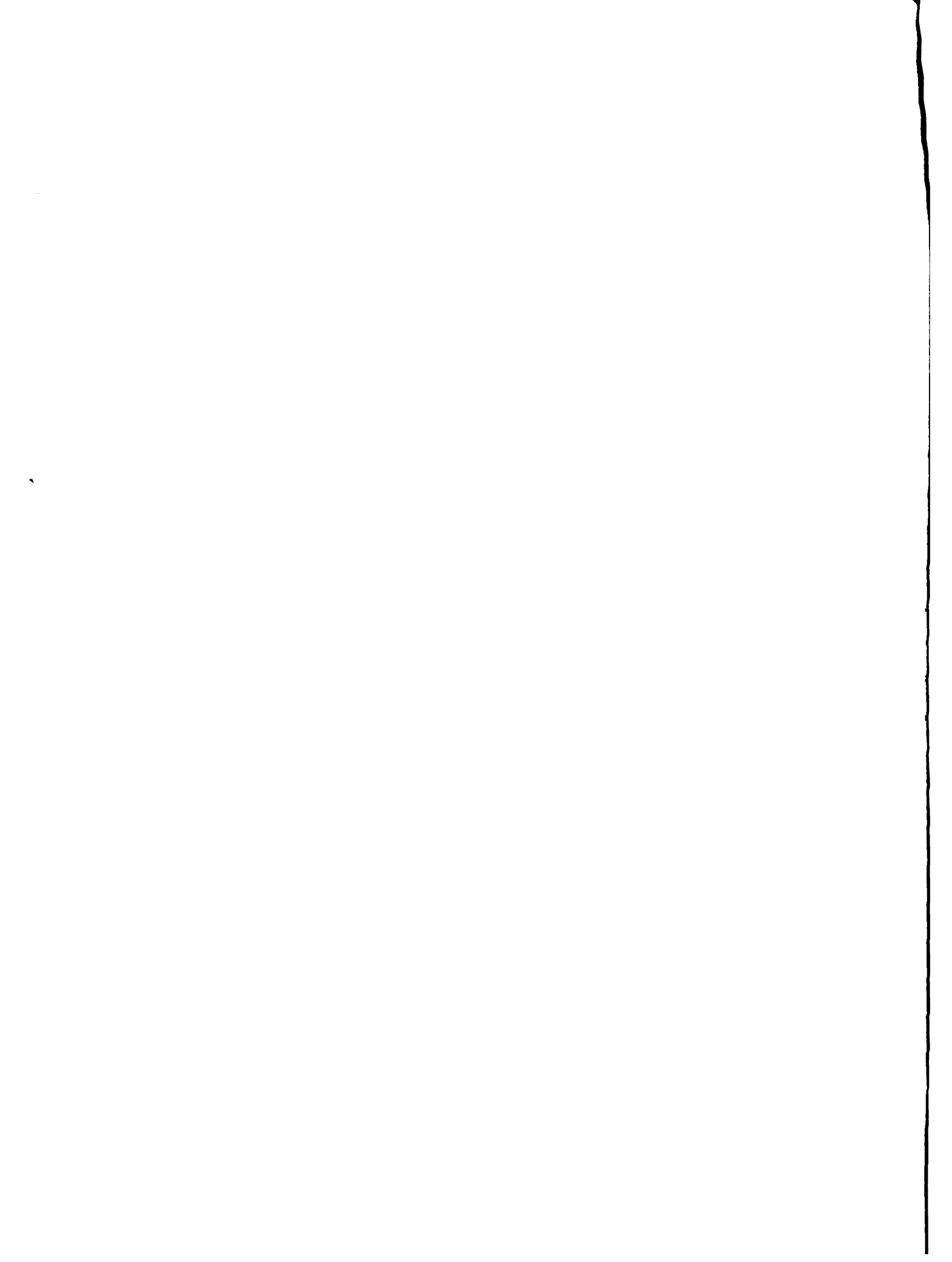


2.

4. Even though this very close co-ordination is desirable, steps should be taken to see that the relationship of both sections with the farmer, is not harmed. The link, therefore, should be more on a personal basis between officers in both divisions.
5. Follow-up work should be mandatory by both divisions.

Other

1. A positive step should be taken to improve the centralised communication system of the Ministry.
2. The Annual staff conference should be held during the second dry season, with Crop Science and Extension having a mini-meeting before the general staff meeting.
3. There should be more control over the sale and distribution of seeds by commercial houses. Preferably, steps should be taken to see that preparation of seed laws is expedited.
3. More emphasis should be placed on taking soil samples from commercial farms. The idea of taking soil samples from back-yard garden plots should be discouraged.
5. The Regional Administration should be approached to facilitate movement of the research and extension staff in the various regions.
6. The salary disparity between the extension and research staff as well as the lack of incentives for officers in the rural districts must be looked into.
7. Positive efforts must be taken to see that as many of the conclusions reached at our seminar as possible are implemented.



## Appendix 2

### Recommendations and Conclusions from 1977 Seminar: Rationalization of Research in Agriculture and Related Fields

#### CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations from the Seminar aimed at the Rationalization of Research in Agriculture and Related Fields are as follows:

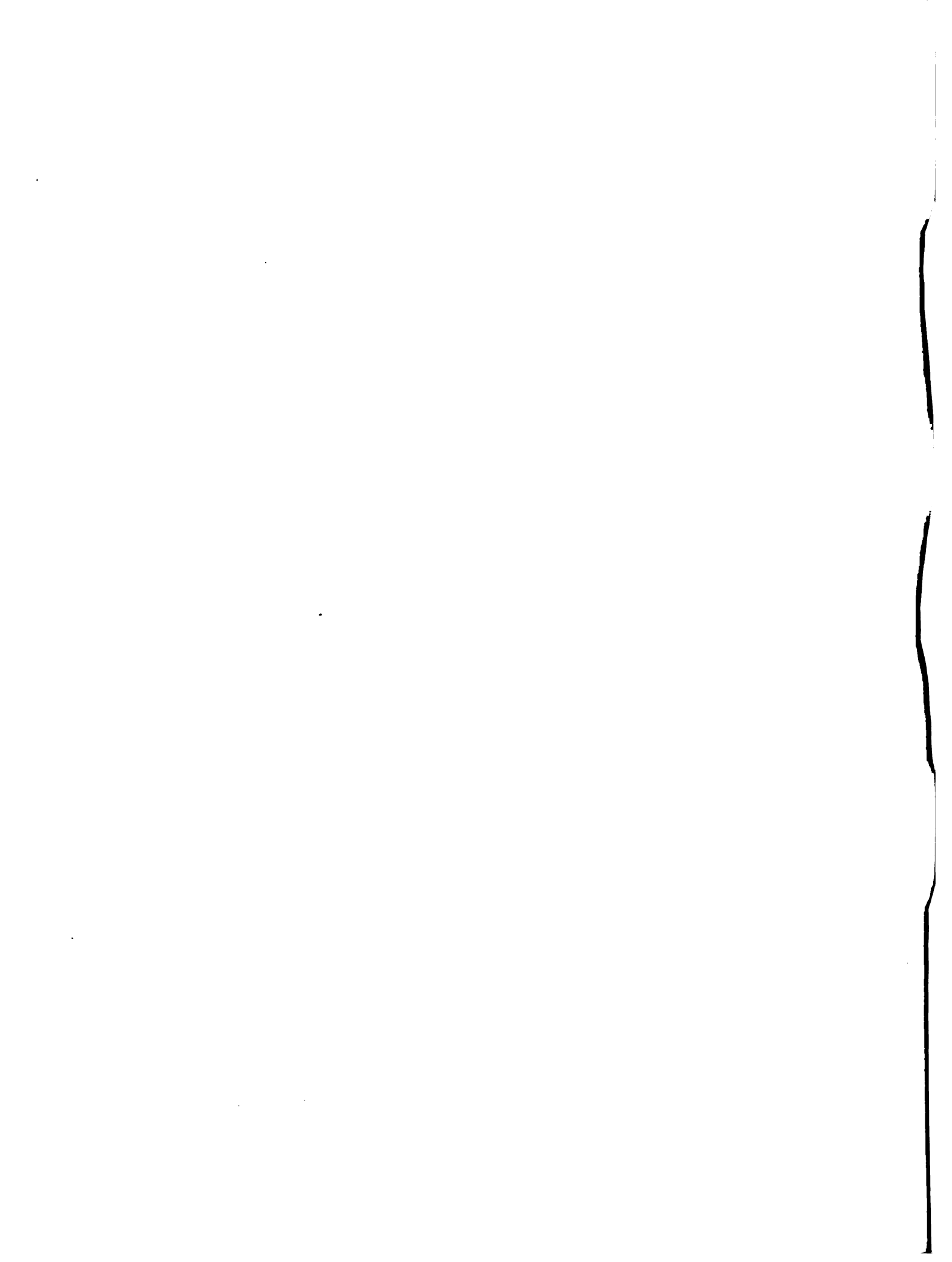
A. The national production base for agriculture should be structured as follows:

- Farm enterprises of top priority should include:  
Sugar, rice, coconuts, cassava, fruits, grain, legumes, vegetables, cotton, corn, oil palm, coffee, pigs, poultry, cattle, sheep, goats, bees and fish;
- Production should be effected by individual farmers, co-operatives, corporations and other relevant state agencies in suitable parts of the country;
- Services available to producers should include:  
Marketing  
Meteorological information relevant to agriculture  
Supplies of necessary inputs  
Credit  
Extension  
Training in the management of farm enterprises.

The volume of, and desired rate of increase in, production to be generated from each farm enterprise and from each location/region should be computed in light of the national development programme. The availability of credit should be assured by an annual allocation of a fixed percentage of either the surplus from the agricultural sector or the G.D.P. to the G.A.C.D.B.

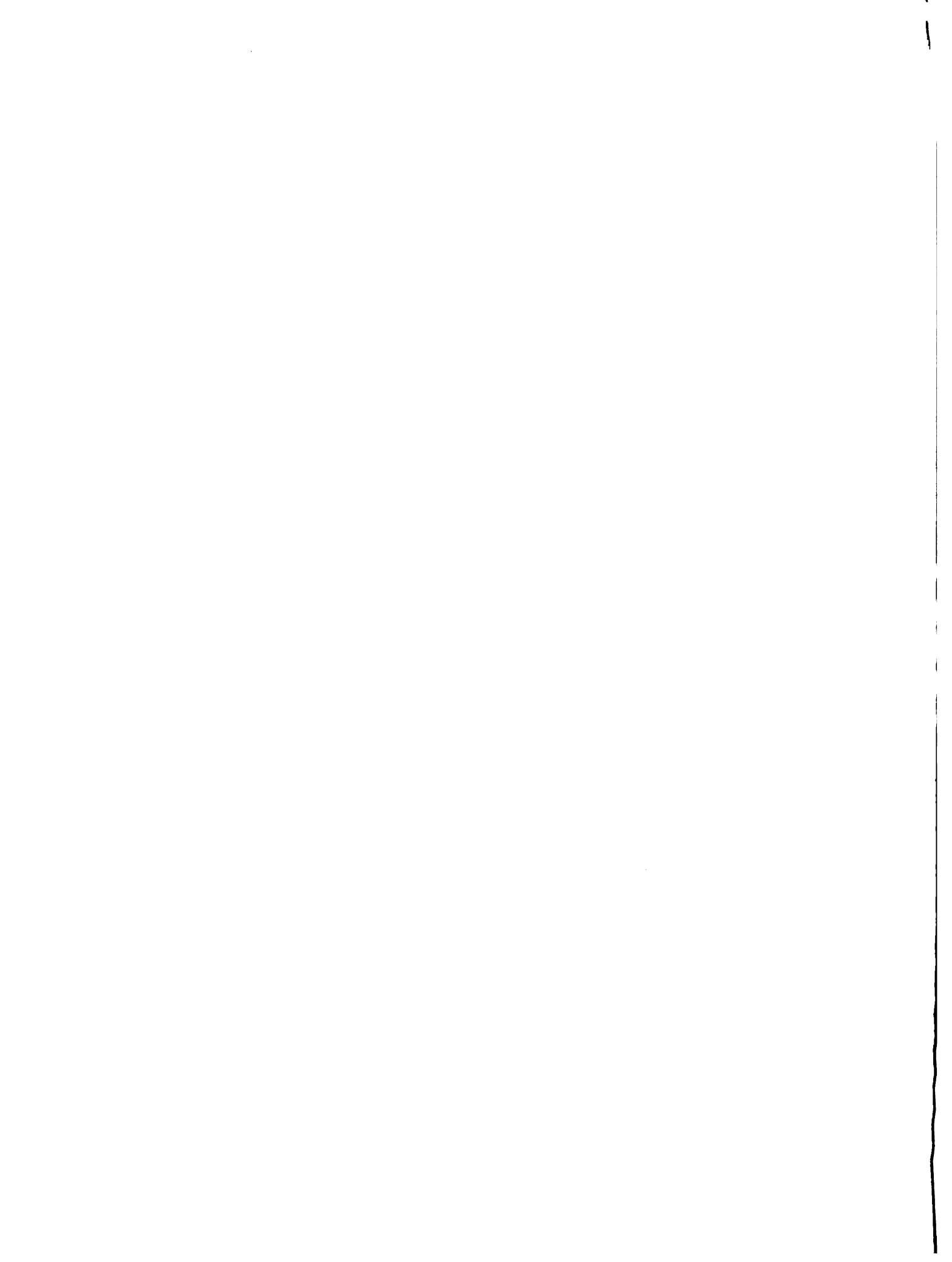
B. The research activities necessary for the attainment and maintenance of the desired quantity and quality of production were considered to include:

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## Studies into:

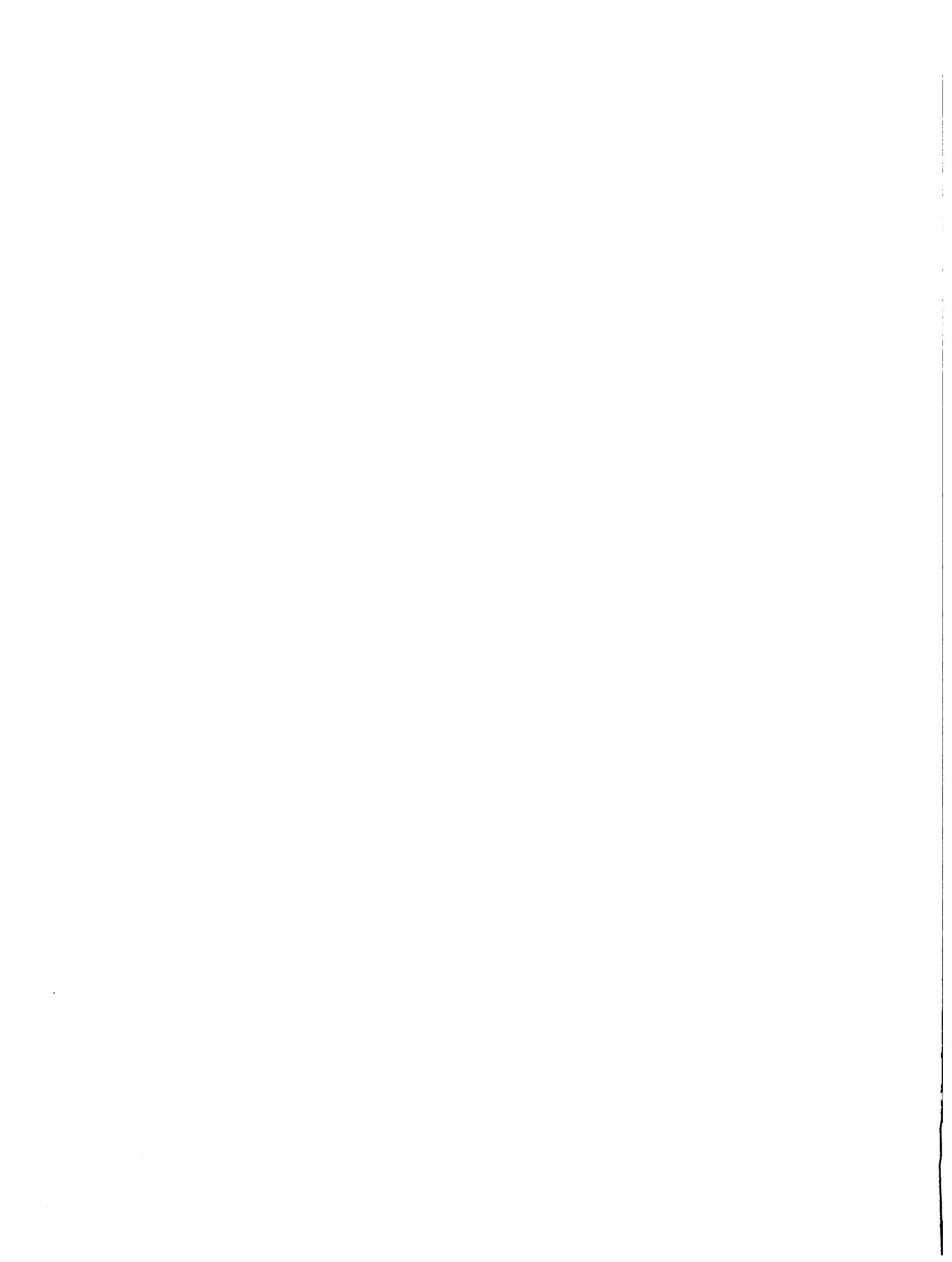
- the organisation of production;
- the size structure and location of farms and the farm population, as well as the levels of production as revealed by regular censuses, should be analysed and the nature of necessary changes established with the collaboration of Rural Sociologists;
- the legal aspects of land tenure and the patterns of land-use, e.g. absentee ownership, fragmentation of holdings should be examined with a view to review/reform of land-use and tenure for more efficient use of land and therefore capital and credit;
- the ratio of farmers to extension officers should be examined with a view to increasing the impact and efficiency of the Extension Service;
- the organisation and management of co-operatives should be examined with a view to improving their efficiency and effectiveness;
- the socio-economic factors, which influence the mobilization of our human resources for agricultural production, e.g. sources and levels of income to farmers, attitudes to work by farmers and professionals, etc., should be examined with a view to identifying the constraints;
- the nature and value of the system of shifting cultivation should be established;
- the supply and management of water for agricultural uses, particularly in the intermediate savannahs, should be examined;
- the effect of dew on plant growth needs to be understood.
- the elimination of waste:
  - alternative uses for non- or under-utilized equipment and facilities should be identified;
  - systems for more efficient and/or intensive use of land should be developed, e.g., intercropping of cultivations, finding alternatives to flood fallowing, etc.
  - the use of machinery in agricultural production should be examined with a view to optimizing the impact on production;



3.

- methods need to be devised for the conservation of fodder;
- the possibility of recycling irrigation water should be examined;
- the handling and distribution of food items, particularly fruits and vegetables, should be examined with a view to minimizing losses between the field and the consumer.
- development of new products/uses and standards for quality control:
  - new products should be developed from materials now considered as waste;
  - additional and/or alternative products/uses should be developed from existing produce, particularly sugar and rice.
- improvement of production levels:
  - systems of production and management of crops and livestock should be looked at in relation to soil conservation and the preservation of the quality of the environment;
  - the impact of the environment of production should be examined with a view to establishing production programmes suitable to the different ecological zones of the country, particularly the Mazaruni and Intermediate Savannahs;
  - improved seed stock should be developed or acquired;
  - study and revision of the G.S.A. curriculum in order to improve the content in the theory and practice of Extension techniques;
  - establishment of the nature and level of education required by and available to farmers;
  - strengthening the motivation of farmers and extension workers;
  - integration of existing extension services and the circulation of available information on the constraints to extension work for study by extension workers.

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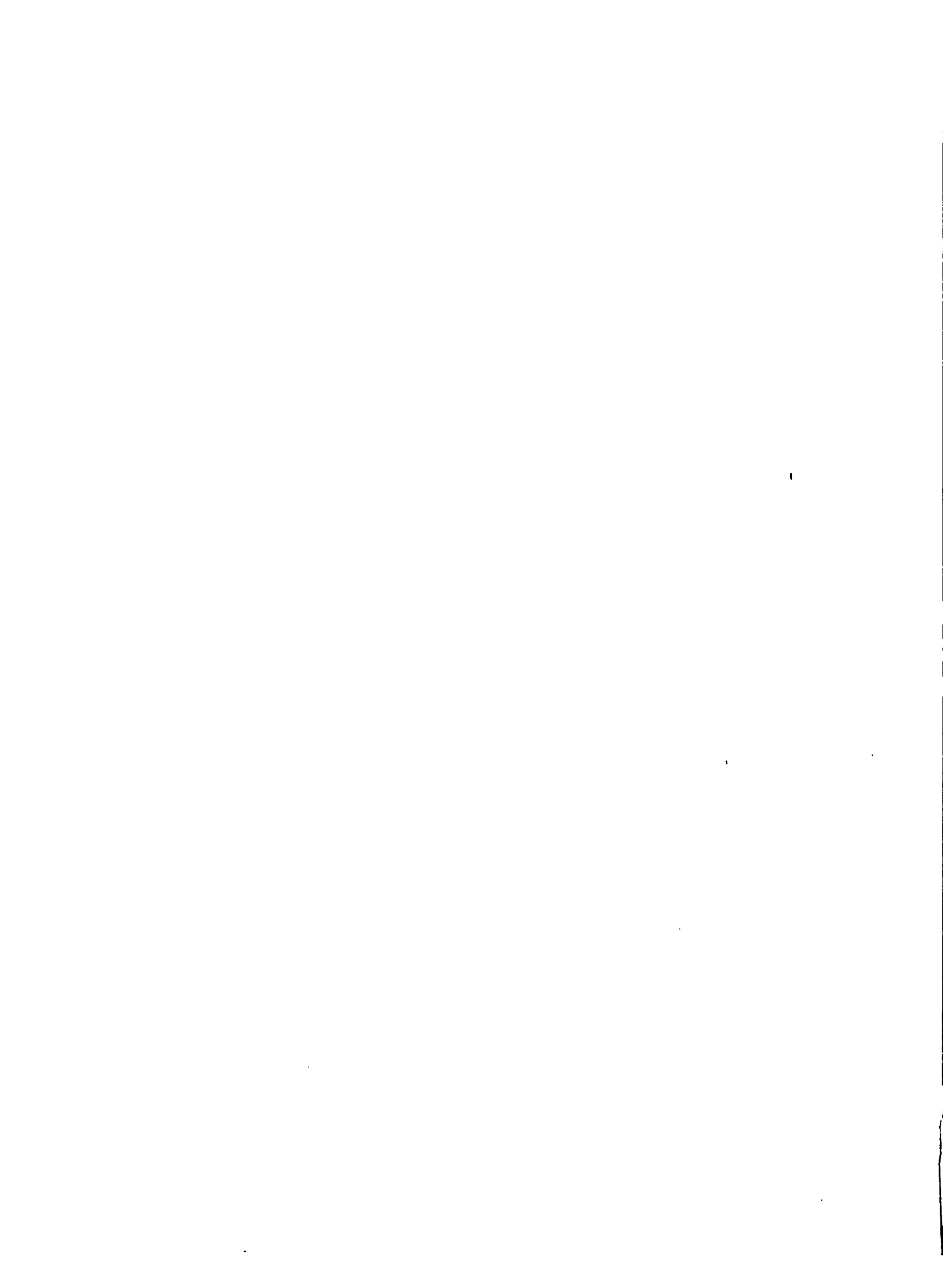


- preparation of inventories of our:
  - soils and their uses;
  - water resources;
  - manpower resources and technological capabilities;
  - materials now considered as waste but which may have industrial use.
- analysis of existing projects to establish ways and means of improving their viability, if necessary, and to provide information which might be useful in the detailed planning and effective implementation of new projects.
- improvement of the acquisition, storage, distribution of information in agriculture:
  - documentation and circulation of all available relevant research data should be effected with the aid of specialists in the subject areas of priority;
  - research data generated in Guyana but not now in Guyana should be procured;
  - technical journals should be produced by the Agricultural Research Committee and by the Society of Professional Agriculturists of Guyana.

C. The Research needs should be satisfied by appropriate institutions. Among these should be:

- A National Water Resource Authority;
- A Market Research Centre;
- A Pesticides Laboratory.

D. The Agricultural Research Committee of the National Science Research Council should co-ordinate and evaluate research activity and should review and catalogue all past and current agricultural research projects in Guyana and those done in other countries but of some relevance to Guyana. The Committee should provide information to the Curriculum Development Unit of



the Ministry of Education for the preparation of teaching material in agriculture in schools.

E. RESOLUTION

WHEREAS

Commonly accepted factors of agricultural production are land, labour and capital, history reveals that science and technology have appreciably increased production and productivity - its importance being amply borne out in discussions during the last three days, and whereas discussions at this Seminar have highlighted the fact that using advanced tools of production without matching local scientific information can be wasteful; and whereas science and technology can itself be considered as a tool of production, and like other agricultural inputs, costs money, points to a need for a policy on funding the science and technology.

AND WHEREAS

In 1975, sugarcane, paddy, livestock, fish, forestry and processing of sugar and rice contributed 437M dollars out of a GDP of 1093M dollars, i.e. 40%; it is not surprising that agriculture is considered to be the mainstay of the economy. And whereas, in advanced agricultural countries, about 2% GNP is spent on agricultural research and on this basis, about 22M dollars would need to be spent in Guyana for the development of science and technology in agriculture. There is great need for emphasis and expansion of agricultural science and technology. A policy statement that Government will increase the expenditure on agricultural science and technology to 2% of GDP in the next ten years will help in identifying and preparing projects and in organising facilities and institutions to serve the nation.

It is recommended that:

- a) the level of expenditure on agricultural research be raised from a starting point of 1% of the GDP in 1973 by increments to 2% in a period of five years;
- b) special emphasis needs to be placed on areas of priority to the production programme in the allocation and utilization of these funds.





FECHA DE DEVOLUCION


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Autor

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Fecha Devolución

Nombre del solicitante

