

**REPORT OF THE WORKSHOP ON THE
VALUATION OF THE DIRECTOR PLAN
OF CAPTSA**

(10-14 February, 1992)

Report of the workshop on ...
1992 FL-PP-03775



CPATSA-6555-1

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INTRODUCTION

A Committee composed of national and international professors, rural specialists and producers participated in the valuation of the "Centro de Pesquisa Agropecuária do Trópico Semi-Árido". The Committee had enough material, as technical documents, presentations of the internal and external situation of CPATSA, visits to experimental stations and contact with research scientists. The Committee expresses its gratitude to CPATSA for providing all the facilities which made it possible to achieve the objectives of this work.

This report is divided in three parts: 1) Analysis of the present situation of CPATSA related to the research needs; 2) Definition of great challenges and the mission of CPATSA, and 3) Proposal of direction and strategy actions according to the challenges and to the objectives.

1. THE PRESENT SITUATION

1.1. THE INFLUENCE OF THE PAST

CPATSA was established in a expanding economical phase when inter-regional differences were a reference for the political priorities of Brazil. Research studies were a priority. Financial support would never fail. The structure of CPATSA was important. The project of CPATSA was coherent with the involved (mobilized) resources (see the project for establishment of CPATSA in 1974), and would satisfy all the necessities for the farming systems of the Brazilian semi-arid. There was a great research scientist team specialized in many areas of study (multidisciplinary team).

The initial conception of CPATSA was open. The research programs would be planned according to the survey of the existing farming systems and to the limiting factors. However, CPATSA was not able to accomplish the initial diagnosis satisfactorily, and the reserch programs were characterized by:

- the freedom that each research scientist had to decide what to study (search). There was not the multidisciplinary team study. The abundance of resources caused an uncertain definition of priorities. It was possible to do everything without competition, the research programs were carried out separately, even when the idea of farming sustem tried to bring together all the efforts in a common project.

- the character of "descendant research" did not consider the "reality" (diversity of the physical and social environments) and the popular knowledge was underestimated. The initial formation of the research scientists (thematic) is one of the reasons pointed out.
- the concentration of the research work in only one place, the region of Petrolina. The research scientists could better face this reality in an intuitive manner or due to their own convenience.

This closeness had a detrimental effect on the ecological and social complexity of the TSA. This is explained superficially in the document PDU-0.

The above factors contributed for the insufficiency of the research system, despite the great number of "products" (documents, technology, methodology...).

This production helped CPATSA to be recognized by research and extension institutions, by financial agencies and farmers, in an unanimous way, as an essential partner, in both irrigated and rainfall condition research studies. This recognition is based on the potentialities of CPATSA and on the pioneer role that it played in many places. In fact, nowadays CPATSA seems to be the Northeastern institution which holds a great number of information for attending the needs of the agrarian systems of Northeast region (examples are the agro-ecological zoning, links with mayors and state governors, experience on research-extension

integration, working together with the private enterprises, good location of the institution).

This does not mean that these elements are enough for CPATSA assuming the leadership in the developing process of the Semi-Arid Tropics, in a regional view, but also, in its ecological and social diversities (divergence), in which the difference between irrigated agriculture and dryland agriculture is the great expression.

Unfortunately, these needs coincide with a national steep financial crisis which shows the unbalanced existing situation.

1.2. THE FINANCIAL CRISIS AND THE DEGRADATION OF THE WORKING CONDITIONS.

The financial crisis which affects CPATSA is strong. It was aggravated in the past years and caused some consequences:

- a) decrease in the number of research scientists (even if other reasons are pointed out);
- b) great difficulties in the coordination of the research;

The fixed cost absorbs almost all the financial resources of CPATSA. It is necessary to define the priorities for the different projects. The nonexistence of a system for planning and efficiently evaluate made it difficult to define the priorities properly. It is necessary to concentrate efforts (as a team) and reduce the number of project per each research scientist.

c) a slowly situation, discontent and demoralization;

It is evident that a decreasing in the financial and human resources is a determinant factor with an extreme importance.

1.3. THE ANSWERS

Many reactions were observed from the segments of CPATSA, which can be classified in the following way:

- a greater effort on the result diffusion:

The Technology Diffusion Sector became more efficient and more persistent. The communication was improved. This diffusion became, also, in the participation of CPATSA in thematic development projects (see the Padre Cícero project about the problems of hydraulics), able to increase the value of the products of CPATSA. The action is said essentially as marketing, and, in fact, considers the diversions of the social and physical means only superficially;

- the organization of answers according to specific needs, well identified. The best example is the research work on "traça do tomateiro". The success depends on availability of technology which can be adapted in shorter time;

- organization of overall research project, aggregating, in a coherent way, activities of a sector. The presentations of the activities of the coordinations of livestock and of the association of agriculture/forestry/livestock show the quality of this type of answers. But it needed a work for identifying, along of the daily activities of the past years which depended on the

capacity of the opening and of the overall view of the involved research scientists.

These reactions became interesting, as they show that CPATSA can coordinate efforts, obtain resources and maintain a level of satisfactory credibility for the civilian society.

However, it is necessary to observe that:

- a significant part of the research scientists does not participate of these dynamics, since they are 'closed' in their projects without great perspectives, in one way due to the lack of conditions and resources, and on the other way, by the absence of outside contacts;

- the dynamics are 'personal' and the mobilization of the research scientists is difficult. There is a consense about the necessity of accompaniment, coordination and scientific animation. But this work becomes difficult, due to the 'unadequation' of many profiles. It is necessary to support and fortify these dynamics;

- the capacity of response depends on the stored knowledge and on the adequation of this knowledge to the necessities and demands. The success is linked to the quality of the past research;

- the limited capacity for modifying the profiles of adaptation of research scientists to the new conditions. It is evident that the trainees, scholarship holders and the young research scientists are considered as key-elements in the consolidation of the dynamics previously described.

These considerations can explain why most of the reactions that define the tenor of the PDU-D are 'passives', requiring to go back to the anterior situations, where there was plenty of resources. Thus, the requests linked to the new structures seem to be unrealistic to the increase of the financial means, even considering the necessity of survival of the institution because of a decrease in its resources, or a long period of crisis.

Concluding, we can say that, because of the financial crisis, some segments of CPATSA will be improved, in a significant way, the efficiency of the technological answers to the demand. But these dynamics seem to be isolated, and deserve to be fortified.

From the above, it was observed that it is necessary to:

- reinforce the general planning function of CPATSA, to improve its performance;
- confort the activities of some sectors of CPATSA by forming teams, significant in size (coming to a critical level).

according to the programming of
expectatives in the

2. CHALLENGES AND MISSION OF CPATSA

2.1. THE CHALLENGES

In this context, the strong demands of the civilian society (we can say the anxieties) and of the financial and management crisis, the challenge of CPATSA may be summarized as:

- a) How will CPATSA show the importance of its role to the society and to the superior authorities which have the power to decide?
- b) How would CPATSA better articulate with the other components of its ecosystem?
- c) How will CPATSA lead the crop and animal research for the rural development of the TSA?
- d) How will CPATSA conciliate satisfying the demands which require answers in a short time, with prospective reflexions which require long time work?
- e) How to inform the human resources of CPATSA about their role in the rural development process?
- f) What to do for CPATSA valorizing its experience?
- g) How will CPATSA elaborate its research projects for attending the demands for the different ecosystems of the TSA?
- h) How will CPATSA cross the obtained technical knowledges, according to the diversities of the needs and social expectatives in the TSA?

These challenges will bring out a proposal of modification of the definition of the mission, the objectives, the directions and strategies of action of the PDU-O, in order to consider in a more expressive way:

- the regional characteristic of CPATSA;
- the necessity for integrating to its activities the role of coordination of the SIBRATER;
- the urgency for attending the civilian society demands.

2.2. THE MISSION

Generate and adapt knowledges and technologies in crop and animal sciences, using them to develop the rural area of the TSA, in its ecological and social diversity.

2.3. OBJECTIVES

- a) Support the dynamic of the growth of the irrigated areas, through:
 - Integration with the national and international markets;
 - Elaboration of farming systems more efficient in harmony with the environment;
- b) Fortify the production struture in the dry zone, by elaborating adequate cropping systems integrating livestock, forestry and agriculture without damaging the environment;

- c) Look for the collaboration and integration of all the Research Centers, in a regional project for the TSA, which would be able to answer the diversity of situations, by a planning which includes the:
- identification of the potentialities, limitations and demands;
 - "priorization" of the research lines;
 - mobilization of human and financial resources;
 - valuation of the results and impacts.
- d) Promote and stimulate the transference of knowledges, technological information and services, and research processes, by the actions of systematic diffusion in the region.

2.4. DIRECTIONS

- a) Valorize the role of CPATSA to the civilian society;
- b) Organize the research in function of the ecological and social diversities of the TSA;
- c) Privilege the technologies and knowledges which allow the best use of the available resources (natural, social and economical) specially the livestock integrated with the agriculture and forestry;
- d) Incorporate the principle of stability, sustentability and equity to the generated technologies and knowledges to the agricultural ecosystems of the semi-arid;

- e) The methodological emphasis of the research will have to be interdisciplinary and participative, involving the farmer, his family, the rural community and the extension service;
- f) Participate in the programs of regional development and of national use of the natural resources and environment;
- g) Amplify the activities of information, diffusion and transference of technology and fortify the relationship with the national and international scientific and technological communities;
- h) Offer elements to the formulation of the regional policies, giving emphasis to:
 - the rural credit;
 - the commercialization of the production

2.5. STRATEGIES

- a) Act in the geografical area of the semi-arid, with a compatible number of human, financial and technical resources with capacity of mobilization;
- b) Maximize the integration with rural extension service and other institutions, developing projects of research and development, specially in areas or communities, where these actions are already present;
utilizing, mainly, the culture, habits and traditions of the regions with physical, social and economic characteristics similar to the TSE;

- c) Utilize, in a total and rational way, with close articulation and interaction, specially in regional level, the crop and animal science research structure (SCPA), the universities and correlated institutions, governmental or not, in a way to answer adequately the research demands in the different spaces and sectors of the TSA;
- d) Utilize the theme of research and development, with global and interdisciplinary vision, considering the farmer as the active agent in the planning, conduction and evaluation process of the actions referring to the theme;
- e) Emphasize the farmer's level research in an integrated process to the analytic research, conducted in Experimental Station;
- f) Reduce the dependence of financial resource budget, by the diversification and a more efficient external grant program, from national and international financial agencies, public and private, and from the increment in its own income;
- g) Develop programs to develop the human resources in all the levels, short and long term (duration), inside and outside the country, trying, at the same time, to decrease the level of difference between the biological and social areas;
- h) Develop an intensive program for forming the human resources, utilizing, mainly, the cultural exchange with countries and regions with physical, social and economical characteristics similar to the TSA;

- i) Establish agreements with volunteer international agencies, to form persons in service;
- j) Decentralize the financial resource management, giving to the project coordinators the responsibility to organize the expenses, according to the needs of the project approved for each season;
- l) Provide high priority for the allocation of financial resources to the Technical and Documentation Sector, assuring systematic information which guarantees a dynamic research program;
- m) Amplify the actions of information, diffusion and transference of technology, by forming a specialized department in CPATSA;
- n) Realize programs of formation or capacitation of farmers, by trainings, courses, visits, field days and other methods, which would make the farmers able to identify the cause of their problems, take their own decision, decide their own services, establish appropriate technologies and use rationally the available resources.

3. PROPOSALS

The Committee made some comments on:

3.1. THE INTERNAL ORGANIZATION

3.1.1. The proposal for the internal organization reflects the objectives and strategies of action. Basically the technical and scientific organization of CPATSA includes two big segments:

- irrigated agriculture;
- dryland agriculture (activities).

The main points of research which were identified are:

- for irrigated agriculture:
 - a) the technologies and cropping systems (management of means and resources);
 - b) the problems linked to the quality of the product and to the market.
- for dryland agriculture:
 - a) the relationship among livestock, agriculture and forestry;
 - b) the water resources (human and animal consumption, and irrigation).

3.1.2. For each one of these segments, the Committee suggests the formation of a technical coordination, under the supervision of a sub-director of CPATSA who would be responsible for the technical subjects. The coordinations would gather in research scientist teams in a global, multidisciplinary and integrate program (group of projects).

The sub-director and coordinations would be selected by the research scientists and their mission would have a certain duration (about three years). The service functions, including the laboratories, would be managed by the Supporting Assistant Director.

The Coordination of Irrigation would have to obtain funds to develop research from the private enterprises. The existing financial resources would be used for the dryland agriculture research. About 75% of the available financial resources (after deducing the expenses with maintainance of the building) will be allocated for research projects. The research scientists must submit research projects to the Coordination for obtaining money from this source.

3.1.3. To assure the optimization of the resources (financial and human) of the Cooperative Reserach Program, it is necessary a planning action program. The Committee suggests the establishment of a Planning and Allocation of Resource Committee which would be formed by the Directors of the Cooperative System, which would be headed by CPATSA. Concerning its mission, the Committee would:

- Approve multidisciplinary and multi-institutional research programs. It is necessary to compatibilize these programs with the activities of each Research Institution which is part of the Committee. A planning proposal is presented in Appendix 1.

EMBRAPA will have to increase the financial resources for research, giving 10% beyond the budget of each "Research Center" which have to be used only in Experimental Stations as part of its participation in the projects coordinated by CPATSA, described above. If the allocated resources were not used totally by the Center, they have to be transferred to CPATSA to be used in its normal research program.

- Supervise and evaluate the development of these programs. This Committee would have members of other institutions (Universities, etc.).

3.1.4. To develop its function, and in the perspective of a close relationship with different rural development sectors of Northeast, the Committee would have the support of the Regional Unit to the ATER and rural development. This unit would be located in CPATSA. This Service Unit, by its function described in the document of EMBRAPA "Plano de Ação Estratégica da Secretaria de Assistência Técnica e Extensão Rural", has to provide the elements about the 'demand in research', and the viability of the submitted projects to answer this demand, considering the existent social and economical conditions in the TSA.

The Committee judges that the success of the CPATSA mission depends on the performance of these proposals (Committee + Regional Unit for supporting the ATER + Technical Coordinations) and the quality of the relationships among them.

3.1.5. Independently of the proposals, the Committee judges necessary a reinforcement of the technical team of CPATSA, quantitatively and from the point of view of capacity.

From the proposal of closing down the CNPAI, the Committee suggests the transference of the attributions of the technical team to CPATSA. The CNPAI structure would be used as a research unit of CPATSA.

3.1.6. An attached flow chart shows the proposed modifications.

3.2. THE EXTERNAL ORGANIZATION

The emphasis for the relationship of CPATSA, particularly, and of Research Cooperative System, in general, with the different rural development sectors, made the Committee to reflect about the necessary articulations.

These interactions have to come in two levels:

- at the research planning level;
- at the research execution level.

For the planning, the role of the Regional Supporting Unit to ATER was already described.

For the execution of the research, the organization has to take into account the extreme diversity of the physical environment of the TSA. This implicates in the circulation of technical and scientific information among the different components of the cooperative system, being more associated to the methodologies than to the final products, giving space to the necessary adequations to the different ecosystems which form the TSA. For this, the agro-ecological zoning will be a fundamental element.

All the information obtained in the adaptation to the ecosystems would be centralized in CPATSA, being a sum of the reference defined as technologies, analysed in their local of elaboration.

For a better adequation of the products and services, to the demands, it seems important that the research work participates in projects of development, leaded, either by the extension agencies and municipality or other institutions.

The research function of these projects includes:

- the identification of the potentialities and limitations of the popular knowledge;
- the adaptation of the technologies to the local conditions;
- the accompaniment of the actions of development in the perspective of a global reflexion about the definition of the components of an agricultural policy (credit, market, funding, training...).

3.3. ORGANIZATIONAL AND OPERATIONAL STRUCTURE

CPATSA has given a great contribution to the research in the semi-arid region. It could be considered responsible for its work, despite the following problems:

- a) The research in CPATSA is carried out in 04 (four) Experimental Stations, which are not adequate. More Experimental Stations are necessary for realizing research in all the semi-arid region. A cooperation with other research institutions would help to solve this problems;

- b) It is necessary a great number of Stations to cover the big differences in rainfall amount and in soils of the Brazilian Northeast. These stations would need financial resources to operate;
- c) CPATSA is located in a central situation, as compared to the other research institutions. It is a strategic position for coordinating research projects in the Brazilian Northeast;
- d) The equipments in the Experimental Stations are old and need to be repaired. This reflects a limited budget for the operation of the Stations, which has a negative effect on the impact of the quality of the research developed by CPATSA and disgust the research scientists;
- e) The Library has a good quality, with space for expansion. However, new publications have not been acquired, due to a shortage of financial resources. Translation of important documents for the Portuguese language would increase the use of the Library by the research scientists;
- f) The Technological Diffusin Sector needs new equipments also. The production of scientific papers would be improved by the use of computers, using appropriate text editors for this means.

3.4. HUMAN RESOURCES

The human resources, in terms of number and training of scientists, are in Table I.

In general, the reduction of the financial resources seems to have affected, in some way, the training and the motivation of the employees of CPATSA. The employees seem to be accommodated. There is a lack of financial resources to bring in foreign consultants and to send out CPATSA staff for conferences, workshops, which is affecting the motivation.

The salary level is low, which results in disinterest of the research scientists in developing research, and, in some cases, it is necessary that research scientists look for other sources of money to maintain their families.

As a special incentive, it is recommended that the Sub-Director and Adjunct Directors of Irrigated and Dryland Agricultures be chosen by the research scientists in each three year period. These positions would be replaced at the end of each period.

It is recommended, yet, that the research scientists have the control of the financial resources allocated through new proposal.

There is a valuation system in which the impacts are not known.

Table 1. Staff of the Northeastern Research Units

UNITS	RESEARCH SCIENTISTS*	ADMINISTRATION/SUPPORT	TOTAL
CNPA	44	108	224
CNPCa	33	86	119
CNPC	24	134	158
CNPAI	29	128	167
CNPMF	51	188	239
CNPCo	30	144	174
UEPAE TERESINA	32	134	166
CPATSA**	57	369	426

*UNITS	RESEARCHER 1	RESEARCHER 2	RESEARCHER 3	TOTAL
CNPA	10	24	10	44
CNPCa	02	22	09	33
CNPC	05	17	02	24
CNPAI	09	20	00	29
CNPMF	05	36	10	51
CNPCo	01	24	05	30
UEPAE TERESINA	06	21	05	32
CPATSA	11	37	09	57

** Two research scientists are working in EMPARN

The number of research scientists is coming to a critical level that the additional losses will bring the number below the "critical mass" necessary to realize the research properly with the approval of CPATSA.

The number of employees that supports the research work is adequate; however, the number of persons in the administrative service seems to be excessive.

As EMBRAPA evaluates and controls the total number of human resources in the Northeast, it has to consider the transference of an appropriate number of research scientists, with an adequate budget, for CPATSA having conditions to support the irrigation program. The closing down of CNPAI seems to be an opportunity to transfer research scientists to CPATSA. This has to come with adequate financial resource.

3.5. FINANCIAL RESOURCES

The financial resources for funding the research and research scientists are not sufficient.

The limited financial resources are allocated in a way that the research scientists do not know what is available to their projects.

The Committee recommends that each research scientist be responsible for a budget to manage.

This process would be used for the projects funded by the general budget (EMBRAPA) and for the projects funded by the incentive funding or by contacts with international agencies and/or institutions.

As it was said earlier, EMBRAPA would establish a fund of 10% (ten percent) from each budget of the Northeast Institutions to be used as incentive for the development of inter-institutional cooperation.

4. SYNTHESIS AND CONCLUSION

The Committee judged that the action of CPATSA in its fifteen years of existence, according to the qualified results, which clarified the technological way of the semi-arid, observed significant faults associated to:

- deficiency of planning;
- deficiency of management of the research in general;
- unadequacy of the role of the research scientists in the society (lack of political and social knowledge);
- insufficient sensibility to the real problems of the TSA (lack of method for realizing the diagnosis seems to be important).

The lack of financial resources in the last years strongly affected the productive capacity of CPATSA.

Despite "restrictive diagnosis" done, in general, to most of the research institutions, the Committee points out the great demand of the civilian society in relation to the action of CPATSA.

In the perspective of the regional inequalities in Brazil, CPATSA is a basic institution for the TSA, because it plays a fundamental role in the Northeast.

The recommendations of the Committee tried to conciliate the answer to the demands, aiming to eliminate the main difficulties pointed out.

It is valid to say that a better research planning and management is necessary, However, CPATSA will not accomplish its mission without a substantial increase in its financial means.

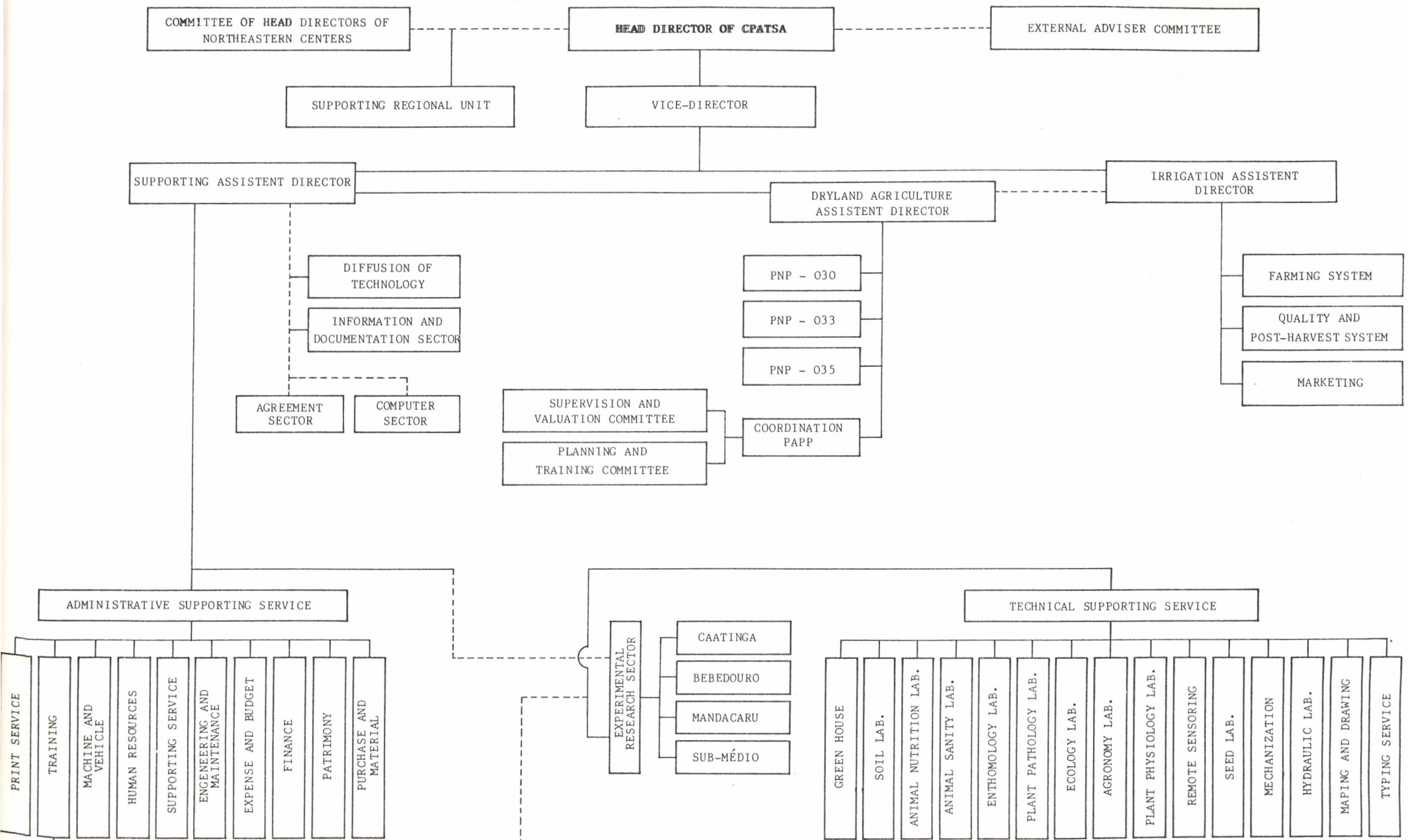
APPENDIX 1

PLANNING PROPOSAL

According to the suggested flow-chart it will be formed a Committee composed by the Head Director of the other EMBRAPA Research Units in the Northeast. This team will meet once a year. Each member of the team (Head Director of Institution) will have to present a list of the research priorities for his unit, according to the research scientists in connection with the farmer's needs and technical advising of the rural extension service. The Head Directors will approve the priorities of each research unit. The team will also approve the research priorities for CPATSA. The priorities of CPATSA will be sent to all CPATSA research scientists. It will have a call for submitting research project proposals. The research scientists of CPATSA will form teams, which will include researchers from other institutions, which will submit the proposal for future research. The advisory team will decide which projects to approve, according to the demand of the farmers. If there is similarity in the submitted projects, the advisers will consolidate those projects. The final proposal will be analysed by a number of selected research scientists. External financial resources have to be obtained to complement the exceeding financial costs of the projects. The irrigation projects will have to be funded by outside sources.

The final selection will be done by the majority of the advisory team, with the sub-director of CPATSA keeping the power to disapprove. The advisory team can disagree of a decision, having the ayes of 3/4 of the components.

FLOW CHART OF CPATSA



APPENDIX 3

Specific technical suggestions for CPATSA achieving its strategies through research and development.

1. Goal: Expand the animal production.

Method: Apply the existing research results, together with the new research in the following areas:

- a) Water supply;
- b) Forage supply;
- c) Breeding and disease control;
- d) Research on post-harvest and marketing.

2. Goal: Apply the existing research results and develop new methods in the following areas:

- a) Building of separate cisterns/ponds for human consumption and animal consumption, without the risk of water loss by infiltration and/or evaporation. The farmers will use the existing water reservoirs in the farm for supplementary irrigation during and immediately after the rainy season;
- b) Improve the use efficiency of big reservoirs by compartmentalizing. This efficiency is close to zero in most of the reservoirs;
- c) The technology of propelling power pump can be used to improve the water pumping efficiency with low pressure in big and small irrigation areas. These pumps can be

ten times more efficient than the centrifugal and low pressure pumps;

- d) Develop electrical cultivators which can be used in small farms by the use of solar energy, wind power or recharge station. These are one kind of low energy consumption cultivation which can use the agricultural implements already developed by CPATSA;
- e) Develop research on post-harvest and marketing to demonstrate how the marketing system developed in the irrigated areas of the São Francisco River Valley would be use by cooperatives of small farmers;
- f) Utilize the technology developed by the conventional irrigation area for the small farmers;
- g) Expand the works on water catchment "in situ" in dryland agriculture areas. Try to simulate bigger water catchment area in computers and then test them in the field;
- h) Expand the works with supplementary irrigation of rainfed crops using the "compartment" reservoir method.

3. Goal: Provide financial means for the small farmers.

Method: Work with the Banks for expanding the loans where the farmers can pay with the crop products equivalent in money. The farmer can understand this form of loan payment.

4. Goal: Reduce the migration of rural zone population during the drought periods by increasing the water supply for human consumption.

Method: a) Use new treatment of low reverse pressure with osmotic membrane called nanofiltration to utilize in ponds;

b) Use nanofiltration to treat water for human consumption;

c) Search improved methods for cistern and pond construction using cover of cement capsules coated with isopropylene plastic and/or clay.

5. Goal: Increase the financial resources of CPATSA

Method: Produce and sell technologies in the following areas:

a) Floating propelling power pumps which can be attached to tractor;

b) Eletrical cultivator powered by solar energy and accessories;

c) Small pumps powered by solar energy for domestic use;

d) Nanofiltration system for ponds and superficial water treatment;

e) Control of evaporation and infiltration;

f) Seed production.

6. Goal: Expand the use of big irrigation systems.

Method: Search and demonstrate new lines of polyethylene with high density with mortar or granite cover. This material can be used in big irrigation channel or for covering secondary channels. It will make them economically feasible.

/mcs