ASSESSING ORGANIZATIONAL EFFECTIVENESS IN AUSTRALIA'S PLANT QUARANTINE SERVICE

by

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CONTENTS

I. INTRODUCTION

Plant quarantine is significant for countries like Australia whose agricultural sector plays an important role in their income earnings. This activity is carried out with the aim to protect agriculture and the environment from the damages which may be caused by hazardous organisms inadvertently introduced by men.[1] Those organisms may be plant pests or diseases, whose introduction can be harmful. That is why they must always be kept outside Australia, and this is done through plant quarantine.

The plant quarantine activities in Australia are carried out by the States' Departments of Agriculture on behalf of the Commonwealth. The Commonwealth department which is responsible for plant quarantine at the present time is the Department of Primary Industry. This responsibility is discharged through one of its eleven divisions-The Australian Agricultural Health and Quarantine Service. The Department of Primary Industry has just recently been given the responsibility of plant quarantine following the administrative arrangement which transferred to it that responsibility from the Department of Health.[2]

Due to the importance of plant quarantine, the organization which is responsible for its discharge must always be effective. This dissertation is concerned with the study of organizational effectiveness of Australia's plant quarantine service, in terms of how the organization can be assessed.

In the first part of this dissertation, the literature on organizational effectiveness is reviewed with the purpose of identifying a framework for analysing the effectiveness of the concerned organization. Current assessments of the organization are also reviewed.

In the second part of this dissertation, the state of Australia's plant

quarantine service is forwarded as background information.

In the last part of this dissertation, the assessment problem and its application to Australia's plant quarantine service is discussed. The proposed model in this dissertation is a modification of the process model. While it is used in assessing the effectiveness of Australia's plant quarantine service it may also be used in other plant quarantine organizations, for example in Indonesia's plant quarantine service, in which the writer has been working for the last fourteen years.

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[1]Robert P. Kahn, "Plant Quarantine: Principles, Methodology, and Suggested Approaches," in William b. Hewitt, and Luigi Chiarappa, *Plant Health and Quarantine in International Transfer of Genetic Resources,* (Cleveland, Ohio: CRC PRESS, Inc.), 1977, p. 290.

[2]*AAHQS in Action,* (Canberra: The Public Relations Section, the Commonwealth Department of Primary Industry), 1985, p. 2.

II. LITERATURE REVIEW

1. Introduction

To assess the effectiveness of an organization, a clear framework of criteria for organizational effectiveness, by which the effectiveness of the concerned organization is measured, is needed. However, such a clear framework will not be found in the literature on organizational effectiveness. It is annoying that although organizational effectiveness has been studied by so many social scientists for many years, there is not any general framework of organizational effectiveness that has been successfully formulated. Organizational effectiveness has been studied by, (to name but a few) Georgopoulos and Tannenbaum[1] in the 1950's; by Etzioni,[2] Yuchtman and Seashore,[3] Katz & Kahn,[4] and Price[5] in the 1960's; by Mott,[6] Steers,[7] Ghorpade,[8] and Molnar & Rogers[9] in the 1970's; and by Cameron and Whetten,[10] Strasser et al.,[11] Hoy et al.,[12] and Bluedorn[13] in this decade.

According to Hoy et al., the diversity of the concepts of organizational effectiveness is unavoidable and even desirable. Each organization is a unique system which is facing a unique set of environmental factors. The concept of organizational effectiveness, they argue, is contingent upon the critical variables of the given organization.[14]

Cameron and Whetten, who also agree with the existing variety of the models, claims three problems-multiple conceptualizations of organizations; unbounded construct space; and an absence of consensual criteria- to be the factors that have led to the development of the variety of models of organizational effectiveness.[15]

Authors have conceptualized organizations in a variety of ways: as networks of objects; as rational entities to pursue goals; as coalitions of

powerful constituencies; as information-processing units; and as many other forms. The researches which have been conducted under those different conceptualizations have focused on different phenomena, proposed different relationships among the variables, and judged organizational effectiveness differently. This condition has led to the development of those variety of models of organizational effectiveness.[16]

According to Cameron and Whetten organizational effectiveness is a construct not a concept. A construct is an abstraction inferred from the results of observable phenomena, but its construct space cannot be known. Considered as a construct the total meaning of organizational effectiveness cannot be known. Attempts have been made to define the construct space of organizational effectiveness, and these have led to the development of models of organizational effectiveness, such as the goal model, the system resource model, and the constituency model. However, Cameron and Whetten reject that these models capture the total meaning of organizational effectiveness, although each of the models has its own distinct merits.[17] This absence of the construct space of organizational effectiveness then has also helped the development of the multiple models of the organizational effectiveness.

Cameron and Whetten further argue that the absence of consensual criteria of organizational effectiveness is because organizational effectiveness is inherently subjective. The assessment is based on personal values and preferences of individuals, and the result is the existing multiple models of organizational effectiveness.[18] In another work, Cameron also asserts that the problem of criteria becomes the major obstacle to the assessment of organizational effectiveness.[19]

The existence of the variety of models or frameworks of organizational effectiveness, according to the writer, can be justified provided that they are complementary and not contradictory to each other. It is not unusual, anyway, in

social science that the social scientists view the same phenomenon from different points of view and with different values, and results in that phenomenon becoming more understandable.

As has been mentioned previously, there are many models of organizational effectiveness in the literature. In one of his work, Steers has observed at least seventeen models of organizational effectiveness. In the following part of the dissertation, however, only some models which have been given much attention by the social scientists will be reviewed. These will be the goal, the system resource, the constituency, and the process models.

2. The Goal Model

The goal model is claimed by Bluedorn as the oldest and most predominant among the models of organizational effectiveness.[20] According to this model, organizational effectiveness may be defined as the degree to which an organization realizes its goal.[21] Using this model, it is assumed that the organization has a goal that it attempts to achieve. The effectiveness of the organization is determined by the degree to which the organization can achieve its goal. The higher the degree of the attainment, the more effective is the organization.

The goal model is considered as objective, however, Etzioni argues that it is not as objective as it appears to be. According to Etzioni this is because the value of the assessor may be transferred to the organization observed. Instead of using the organization's goal, the assessor may formulate the goal, which is actually his own value being projected into the assessed organization.[22]

As argued by many authors, to use goal attainment as a criterion of organizational effectiveness may create many problems. The goal attainment

may be difficult to determine, for example, when the goals are multiple, or transitional.[23] The goal may also be misidentified because those who give the information about the goal may distort, omit, or conceal some essential aspects of the function of the organization, or be misidentified with the personal goals of the members of the organization.[24]

There are still many other problems in relation to the goal. As Perrow states there are five types of goals: societal, output, system, product, and derived goals.[25] So which goal attainment must be assessed?

Although many authors criticize the goal model, there are some authors who prefer this model. Hall, for example, prefers this model to others. The system resource model, Hall argues, is enhanced when used in conjunction with the goal model. Although in realizing the goal an organization needs resources, the acquisition of the resources without reference to the goal would be mindless.[26]

To use the goal model for assessing the effectiveness of plant quarantine organization will be difficult. Using the official goal, that is the prevention of introduction or spread of plant pests and diseases,[27] it is still difficult to determine the effectiveness of the organization. The logical criteria in this case would be the number of the incidents of unsuccessful prevention of entry of any exotic plant pests or diseases, which ideally should be nil. However, it is not easy to determine the absence of incidents, because their outbreaks sometimes take years to occur. This can be illustrated by the case of the Banana Bunchy Top Disease. This disease devastated the banana industry in Queensland and New South Wales in the 1920's, however, the introduction of the disease is believed to have happened early in this century from Fiji.[28] Thus, it may happen that an organization previously thought to be effective turns out to be ineffective.

Another problem will be that no plant quarantine organization can be considered effective, because it is difficult always to prevent any plant pests or diseases entering from other countries. According to Kahn all plant pests and diseases will eventually gain access to all regions of the world. All plant quarantine can do is only to delay the spread.[29]

3. The System Resource Model

Considering that the use of the goal model has many problems, the social scientists then, have tried to find other models as the alternatives. Yuchtman and Seashore, for example, have proposed a model which emphasizes the interdependency processes between organizations and their environments. This model is the system resource model.

Using the system resource model, organizational effectiveness may be defined as the ability of the organization to obtain the scarce and valued resources from its environments. The better the bargaining position of the organization, that is the better the ability of the organization in obtaining the resources, the more effective is the organization.[30] This notion, however, is doubted by Daft. Daft argues that an organization may be good at obtaining resources, but it may squander them and thus fail to attain its goals.[31] Indeed, it is annoying that an organization is considered as effective, but it does not achieve its goal.

To use this model for assessing the effectiveness of plant quarantine organization will not be appropriate either. A plant quarantine organization usually is a public organization which can more easily obtain resources, hence the system resource assessment of that organization will not be appropriate. Besides that, as Daft argues, obtaining resources does not guarantee the goal attainment.

4. The Constituency Model

Another model is the constituency model, which concerns the activities of the organization on its constituencies. The constituencies may be any group within or outside the organization that has an interest in the organizational performance, such as the owners, the employees, or the customers.[32]

Using this model, the effectiveness of the organization may be assessed by determining how satisfied each of the organizational constituencies is with the organization. As also admitted by Daft, it is very difficult for the organization to simultaneously fulfil the demands of all constituency groups. This is because each group may have a different demand so that it has different criteria of effectiveness too. Then the assessment will be difficult, because there may be a high satisfaction for a certain group, but low satisfaction for others.

Plant quarantine organizations are law-enforcing organizations. Due to this condition it may be difficult to always satisfy their customers, which may be farmers, horticulturists, plant importers, or passengers who bring in plants or plant materials. If the plants or the plant materials pose risk to agriculture they may be destroyed, which of course will not satisfy the owners, either they are the farmers, the horticulturists, the importers or the passengers. For this reason this model may not be appropriate to be used to assess the organizational effectiveness of plant quarantine organizations.

5. The Process Model

The process model is another model which exists in the literature. This model is proposed by Steers and consists of three related components: (1) the notion of goal optimization; (2) a system perspective; and (3) an emphasis on human behaviour in organizational settings.[33]

The notion of goal optimization is considered, because it has been recognized that in the efforts to achieve the organizational goal there will be some constraints, such as lack of money, lack of technology, and personal problems. So instead of goal maximization, goal optimization may be pursued.

A system perspective, which emphasizes the interrelationships between the various parts of an organization and its environments, is employed to identify influences or organizational effectiveness. According to Steers, there are four major categories of influences on organizational effectiveness. These are :

(1) organizational characteristics, such as structure and technology;
(2) environmental characteristics, such as economic and market conditions;
(3) employee characteristics, such as level of job performance and job attachment; and
(4) managerial policies and practices.[34]

The emphasis on behaviour of members of an organization is considered important in this model. The assumption is that when an organization' members largely agree with the organization's goal, it could be expected that they would give a relatively high degree of effort toward achieving the goal. Alternatively when an organization is in conflict with the member's personal goals, it would be doubted that those members would give their maximum efforts.[35]

This model, as admitted by Steer, is unique in that it does not specify the criteria for effectiveness, but focuses on the process of becoming effective. It is expected that in using this model the manager of the organization will understand whether they move toward or away from the goal attainment, or, organizational effectiveness.[36]

As has been stated above this model emphasizes goal optimization instead of goal maximization. Thus, this model is suitable to be used in a plant quarantine organization, where goal maximization may not be possible for the

reasons described above. The other two components in Steers's model can be used in plant quarantine organization. This model has been chosen to analyse Australia's plant quarantine service, however, in application, it has been modified appropriately for this study.

Modifications are as follows:

In relation with the goal, although in a plant quarantine organization the goal optimization may be more appropriate compared with the goal maximization, here the judgement will not be based on whether Australia's plant quarantine service can lower the incidents as low as possible, but on whether there are problems which may inhibit prevention. Judgment will emphasize the factors which may influence the plant quarantine activities, rather than the goal itself. These factors will be identified through components system perspective of the model, and are those stated by Steers. However, they will not be used exactly as stated by Steers, but will be modified to cover the task environment of Australia's plant quarantine service, which consists of the minister, the public, and the other organization such as the Customs Bureau and the CSIRO.

The members' behaviour will not be emphasized in this study due to the insufficiency of time in gathering the data, but a general impression has been gained using the observation made by the former Director of Australia's plant quarantine service as forwarded in one of his work *The Australian Plant Quarantine Service.*[37]

Before using the proposed model above to discuss the effectiveness of Australia's plant quarantine service, the current assessments of the Service will be reviewed first in the following section.

6. The Current Assessments of Australia' Plant Quarantine Service

In the last two decades there have been four assessments upon Australia's plant quarantine service. These are:

a. Review of Australian Quarantine Arrangements;

b. The Senate Inquiry on the Adequacy of Quarantine;

c. Touche Ross Report; and

d. Efficiency Audit by the Audit Office.

The review of Australian Quarantine Arrangements took place in 1976. The review was carried out by the Department of the Prime Minister and Cabinet in response to a request by the Prime Minister, and in consultation with the Department of Health, which was responsible for the plant quarantine activities at that time.

Some of the findings and the recommendations were as follows :

- there was an overlap of responsibility between the general and plant quarantine in the control of Khapra beetle and similar ship infestation. It was recommended that arrangements be made to avoid the duplication.
- the need to evaluate the merger of plant quarantine and animal quarantine functions for baggage inspection.
- the administration of the quarantine was recommended remain with the Department of Health instead of being transferred into the Department of Primary Industry.
- the arrangement between the central office and the States to remain as it is.
- the amendment of Quarantine Act to permit charges levied in plant quarantine and animal stations to include capital cost and a rate of return comparable to other government financial economic services.[38]

The Senate Inquiry was carried out in 1978 by the Senate Standing Committee on National Resources after its re-appointment in that year. The

task given to that committee was to investigate and report 'the adequacy of quarantine and other control measures to protect Australia's pastoral industries from the introduction and spread of exotic livestock and plant diseases.'[39] The investigation was considered necessary because of the spread of animal and plant diseases outside Australia and the greater movement of people and goods through trade which pose a risk to Australia's pastoral industries by the introduction of exotic diseases and pests of livestock and plants.[40]

As the result of the inquiry, the Committee made several recommendations concerning the service. Among the recommendations were :

- that the Quarantine Act be amended or redrafted in order to improve the status of the quarantine operations.
- that the Quarantine Service be located within the Commonwealth department that had responsibility for agricultural matters. The Committee had also recommended the establisment of an Agricultural Health Service which consisted of Australian Quarantine Service and Animal and Plant Health Service.
- the improvement of some aspects of the administrative arrangements, such as to give a formal basis for the chief quarantine officers conference and to provide access to industry group and organizations.
- the use of enclosed greenhouse as the minimum requirement for the licensed plant quarantine premises. The use of macerator and steriliser was also recommended if proved to be as effective as expected.
- the public education in plant quarantine matters to emphasize the reasons for Australia's strict plant quarantine laws.[41]

In 1984 a private consultant, Touche Ross Pty. Ltd., was engaged to examine and report on financial arrangement between the Commonwealth and the States for the provisions of quarantine service. The report was required by

the financial constraints at the Commonwealth and the State levels and the concern by some of the States about the continuity of the existing funding arrangement.[42]

The main financial issues which were identified in this report were:

- financial arrangements were ad hoc but because of the funding constraints the financial flexibility of the States had been removed
- the delivery of services varied from State to State with no common organizational structure and no common basis for comparing the services delivered by the States
- the delivery of technical services was well controlled and monitored by Canberra but the administrative and organizational arrangements were loose and informal, and
- apart from the expenditure on salaries and salary related items there was no proper base for comparison of individual items.[43]

This report considered that the shortcomings occured largely because of

- a lack of detailed financial control in Canberra
- a lack of accountability at State level in financial and administrative matters
- areas of responsibility and lines of communication in financial and administrative matters were not clearly defined and regular exchange of information was not apparent
- an absence of operational methodologies which could lead to improvements in efficiency and better utilization resources, and
- the lack of detailed information base in Canberra which has prevented the Commonwealth from obtaining an overview of State operation.[44]

The latest assessment, which was carried out by the Audit Office, had started sometime before the transfer of plant quarantine and animal quarantine responsibility from the Department of Health into the Department of Primary Industry. It ended at the time when the transfer had actually taken place, so it was able to review the effectiveness of the administrations of quarantine by the

Central Office in both the Departments of Health and Primary Industry, including the efficacy of the Commonwealth/State arrangement for carrying out plant and animal quarantine functions.

Some of the important findings of the audit were:

- the lack of a formalised management information system that would allow the Commonwealth to assess the cost of operations and to monitor the effectiveness of activities undertaken by the States on the Commonwealth's behalf.
- a low overall level of cost recovery and lack of sufficient costing information to assess the appropriateness of fees set for quarantine service.
- the absence of a formal agreement between the Commonwealth and the States to set out respective responsibilities in regard to financial and other matters.
- the need for a comprehensive evaluation of all aspects of clearance of aircraft and passengers arriving in Australia.
- the need to clarify the legislative authority for quarantine service's inspection program of imported food and the need for closer liaison and co-ordination with the State health authorities to avoid duplication and unnecessary delays, and
- the need to reassess the role of coastal surveillance performed by other agencies and the possibilities that other forms of surveillance might be more cost effective.[45]

In relation to the findings, the Audit Office gave some recommendations which included :

- the review of arrangements between the Commonwealth and the State
- the introduction of a program budgeting system
- a clear policy concerning recovery of quarantine costs and the examination of appropriateness of fees and exemptions

- a greater role for the Commonwealth in determining the content and structure of training programs in the States in order to provide a degree of uniformity and consistency.[46]

In response to the recommendation of the audit, a program budgeting has been employed in the service, although it is confined to the central office.

If we examine further the existing assessments, none of them is concerned with the organizational effectiveness, in terms of whether or not the quarantine service has achieved its objective.

The review conducted by the Department of the Prime Minister and Cabinet was more concerned with internal matters of the quarantine service, such as the strictness of the existing procedures, and how to improve the procedures.

The Senate Standing Committee on National Resources's inquiry was much broader in covering various aspects of the quarantine service. It covered the administrative arrangements, the Quarantine Act, the facilities amongst other things, however, it did not concern itself with organizational effectiveness either.

The Touche Ross report had even much narrower focus than the two previous assessments because it was only concerned with the financial arrangement between the Commonwealth and the States, and of course it was not concerned with the organizational effectiveness either.

The Efficiency audit, although using the term effectiveness in its terms of reference, gave it the same meaning with the efficiency. Here the concern was on the efficiency of the administration of the quarantine function. Organizational effectiveness was not again a concern of the audit, especially in terms of what is meant in the process model.

Given all these deficiencies, the writer believes it is worth trying to find

out whether or not the process model can be applied in plant quarantine service.

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III. AUSTRALIA'S PLANT QUARANTINE SERVICE

1.Brief History

The plant quarantine activities in Australia had been carried out and administered by each of the Australian colonies before the Commonwealth was established. The commencement of these activities can be traced back as far as from 1889 when in Sydney the Export and Import Branch of the Department of Agriculture was established.[1]

With the establishment of the Commonwealth in 1901 the responsibility of the external plant quarantine was taken over by the Commonwealth pursuant to the section 51 (ix) of the Constitution Act. The actual transfer of responsibility, however, took place in 1906, after the States had agreed to transfer, ending a long discussion on this matter. The transfer then was followed by the draft of the Quarantine Act which was passed by Parliament in 1908 and came into force on 1 July 1909.[2]

Although the responsibility of plant quarantine has been taken over by the Commonwealth, the day to day operational activities are still carried out by the States, but this time on behalf of the Commonwealth, while the Commonwealth is responsible for the policies development and co-ordination of the plant quarantine activities throughout Australia. The delegation of the operational activities is due to the existence of the States' infrastructures for dealing with plant quarantine, and the States' continued responsibility for agriculture within their own boundaries.[3]

The first organization established to administer the Quarantine Act, the legal basis for implementing the plant quarantine measures, was the Federal Quarantine Service, a unit of the Department of Trade and Customs. This service was established in 1909, the same year when the Quarantine Act came

into force after being passed the year before. With the creation of the Department of Health in 1921, the Quarantine Service then was transferred from the Department of Trade and Customs into this new department. The transfer of the Quarantine Service into the Department of Health reflected the importance of human quarantine for Australia at the moment. There are three kinds of quarantine in Australia: human or general quarantine; animal quarantine; and plant quarantine. The importance of quarantine as can be seen in the next section, has shifted from the general quarantine to the animal and plant quarantines.

In the early 1970's there were a number of suggestions concerning the Quarantine Service. One of these suggestions was that the Quarantine Service be transferred from the Department of Health, which was responsible for the quarantine activities since its establishment, into the department which was responsible for agricultural matters. This suggestion was due to the fact that the importance of quarantine in Australia has shifted from the general into the animal and plant quarantines.[4] This suggestion was rejected by the Department of the Prime Minister and Cabinet in its review of the Australian quarantine arrangement,[5] but was accepted by the Senate Standing Committee on National Resources in its inquiry on the adequacy of quarantine.[6]

As the follow up of the recommendation of the Senate Standing Committee on National Resources, in 1984 the responsibility of quarantine was transferred again, this time from the Department of Health to the Department of Primary Industry. As a unit of the Department of Primary Industry which would be responsible for quarantine, the Australian Agricultural Health and Quarantine Service was then set up. In this transfer, however, only the animal and plant quarantines were transferred, while the general quarantine was held by the Department of Health. Since that time the plant quarantine activities

have become the responsibility of the Australian Agricultural Health and Quarantine Service (the AAHQS).

2. Function

The function of the AAHQS, as far as plant quarantine is concerned, is to protect Australia's agricultural industries against the entry and spread of serious exotic plant pests and diseases.[7]

In the day to day operation it has the responsibility to develop policies, conditions, and procedures for controlling the importation and movements of plants, plant products, and associated materials. It also has the responsibility to co-ordinate and direct plant quarantine investigations at the Plant Quarantine Research Station, Weston, A.C.T., and to co-ordinate and oversee the plant quarantine operations throughout Australia. Besides those functions, the AAHQS also has the responsibility to undertake investigation and to develop policies on plant quarantine related activities which include: investigation; analysis; and making recommendations on the use of biological agents in agriculture; development of policies on aircraft disinfection procedure; and monitoring of the exotic plant pests and diseases.[8]

Although, the AAHQS has the function to co-ordinate the operational plant quarantine activities throughout Australia, it appears to have no monitoring device. In the effort to co-ordinate those activities, it uses channels of communication such as circular memoranda, newsletters, manuals, or plant quarantine inspectors' training. These will be discussed further in the next section.

3. Power

The plant quarantine activities in Australia are based on the Quarantine

Act. This act was passed by Parliament in 1908 and came into force in 1909. It is sometimes called the Quarantine Act 1908. Besides the Quarantine Act, the activities are also based on same related acts and regulations, such as State Plant Disease Act, and Apple and Pear Industry, Fruit, Vegetables and Exported Product Acts.[9]

According to the Quarantine Act there will be a Director of Quarantine who, under the Minister, will be charged with the execution of the Act and the regulations under the Act. There will be also Chief Quarantine Officers, and Quarantine Officers. All the quarantine officers will be given some powers in order to be able to do the jobs. In performing their duties they will be subject to the directions of the Director of Quarantine who also will have all the powers of a Quarantine Officer.[10]

According to the Act, the quarantine officers have the power to board and inspect vessels or aircrafts or to inspect any goods on board and any papers relating to the vessels or aircraft or goods on board.[11] The officers may also order into quarantine any vessels, goods, and plants which they think to be infected with quarantinable diseases. The goods or plants ordered into quarantine may be destroyed if they constitute a danger of disease introduction and cannot be disinfected or treated effectively.[12] Another power given to the officers is that they may seize any plants, or goods subject to plant quarantine which are found outside a quarantine station and they may convey them to a quarantine station.[13]

Although the officers have been given some powers there is a certain power which is regrettably not given to those officers: the power to search passengers believed to bring in plant materials. Such power is only given to the Customs officers. This lack of power has been noticed by the Senate Standing Committee on Natural Resources in its inquiry on the adequacy of quarantine.[14]

If the plant quarantine officers were given such a power in the day to day operational activities, they would not depend on the Customs officers in performing their jobs as they must at the moment.

4. Organization

As has been described above, plant quarantine in Australia is a working arrangement between the Commonwealth and the States. At the Commonwealth level there is the AAHQS which is responsible for the policy development and co-ordination of the plant quarantine activities which are carried out by the States. At the State level, there are Chief Quarantine Officers, Senior Inspectors, Deputy Inspectors, and Inspectors. The Chief Quarantine Officers are senior officers of the States' Departments of Agriculture. They are responsible for the plant quarantine activities within each of their own States. All the officers, including the Chief Quarantine Officers, are gazetted as Commonwealth Officers.[15]

The organizational structure of plant quarantine varies from State to State, however, there is a general pattern for it. The typical organizational structure can be seen in Appendix 1. There has been an important development, concerning the organizational aspects, that is, the successful integration of the animal and plant quarantines in Northern Territory, New South Wales and Tasmania.

Within the Department of Primary Industry, the AAHQS is one of the eleven existing divisions. Those divisions are:

- Management Division
- Development and Co-ordination Division
- Australian Agricultural Health and Quarantine Service
- Export Inspection Service
- Meat and Wool Division

- Dairy and Intensive Livestock Division
- Field Corps Division
- Forestry and Horticultural Crops Division
- Australian Fisheries Service
- Principle Advisor's Group
- Bureau of Agricultural Economics.[16]

The complete structure of this department is shown in Appendix 2.

The AAHQS consists of six branches:

- Animal Health Programs
- Animal Quarantine & Exports
- Australian Plague Locust Commission
- Development & Laboratories
- Operations
- Plant Health & Quarantine.[17]

The structure of the AAHQS can be seen in Appendix 3. The branch which is assigned to deal with the plant quarantine activities is the Plant Health and Quarantine Branch. The AAHQS is headed by a Director, who is assisted by a Deputy Director and six Assistant Directors each of whom is the head of the existing branches of the AAHQS.[18]

The AAHQS is actually an amalgamation of the Animal and Plant Quarantine Branches of the Department of Health and the former Bureau of Animal Health of the Department of Primary Industry. This service seems to be the union of the Australian Agricultural Health Service and the Plant Protection Service both were proposed by the Senate Standing Committee on National Resources.[19]

As has been mentioned, the States carry out the plant quarantine activites on behalf of the Commonwealth, in this case on behalf on the AAHQS, and the arrangement has existed since the Quarantine Act was introduced. It is surprising that this arrangement, as noted by the Audit Office in its review of the administration effectiveness of the Quarantine function, is not official. It can

be noted that in the Quarantine Act there is provision that the Governor-General may arrange with the Governor of any State to use the States' quarantine facilities or to ensure the Commonwealth and the State' quarantine authorities co-operate in preventing the introduction and spread of diseases affecting plants.[20] Such arrangement would give an advantage to the Commonwealth, in that the Commonwealth would have access to a wide range of professional advice and technical facilities provided by the States, and would avoid the duplication of the resources the Commonwealth is supposed to provide. This same reasoning was also used by the Australian Agricultural Council to reject a suggestion for the creation of a centralised quarantine service, which would have ended the delegation of operational responsibility to the States.[21]

Under the existing arrangement, the States are reimbursed for all the expenses they incur in carrying out the plant quarantine activities (the external plant quarantine activities). Every year the States submit the estimates of expenditure for the ensuing year. The estimates expenditure is based on the assessment of the requirements for personnel and other resources for that ensuing year. Once agreed to, the payments are made quarterly in advance by the Commonwealth, and at the end of the year there are adjustments to actual expenditure.[22]

5. Staffing and Financing

Apart from the administrative staff, the staff who work for the plant quarantine service consist of those of the Commonwealth and the States. The Commonwealth staff includes those who work at the Central Office and the Plant Quarantine Research Station at Weston, A.C.T.

The States' staffs are those from the States' Departments of

Agriculture who are gazetted as the Commonwealth plant quarantine officers. The salaries of those gazetted officers, calculated from the time they work for the Commonwealth, are paid by the Commonwealth through the reimbursement arrangement.

For the reimbursement of 1985/1986 it has been agreed that that Commonwealth will pay around ten million dollars, and for that expenditure the Commonwealth will recover about a half of the sum. The recovered amount has increased as a result of the rising fees for the plant quarantine service, created by very recent introduced legislation. The cost for operational activities for 1981/1982 to 1985/1986 can be seen in Appendix 4.

According to data for 1985, there are 507 gazetted plant quarantine officers, detailed as follows:

New South Wales	:	174 officers
Victoria	:	75 „
Queensland	:	62 „
South Australia	:	48 „
Western Australia	:	68 „
Tasmania	:	25 „
Norther Territory	:	37 „
Australian Capital Territory	:	18 „.[23]

The commonwealth has not laid down any minimum requirements concerning the qualification for officers employed by the States on plant quarantine duties. So far, the Commonwealth has accepted the requirements developed by the States. However, the Commonwealth has planned to develop such requirements as one of its programmes.[24]

Apart from the training for experienced officers, the Commonwealth has not taken the responsibility for developing and organizing training and for selecting officers to receive training, although this was recommended by the

Senate Committee. However, the Commonwealth always scrutinizes the content of the States' training first and has officers present at the training.[25]

In relation with this matter, during its audit on the effectiveness of the administration of quarantine services, the audit team found that there was not any set program of training courses, and it was recommended therefore that in order to achieve a degree of uniformity and consistency the Department of Primary Industry play a greater role in determining the structure and content of the training program.[26]

As has been mentioned several times previously, under the existing arrangement the State are reimbursed by the Commonwealth for all the expenditure they have to expend in carrying out the plant quarantine activities. To obtain the reimbursement, the States have to submit the estimate of the expenditure for the ensuring year. There are sixteen of expenditure which may be reimbursed:

1. Salaries and payments in the nature of salary
2 Overtime and meal allowance
3. Payroll tax
4. Workers compensation premiums
5. Employers contribution to superannuation fund
6. Travelling expenses
7. Official motor vehicle running expenses
8. Cleaning of vehicles
9. Uniforms and protective clothing
10. Office requisites and equipment
11. Stores and quarantine supplies
12. Building services
13. Freight, postage, and telephone
14. Monitoring of exotic insect pests
15. Incidental and other expenditure
16. Administrative charges.[27]

As also has been mentioned before, this arrangement is not officially established, but has existed since the Quarantine Act was established.

In 1984, due to the financial constraint and concern by some States about the continuity of the existing funding arrangement,[28] the Commonwealth engaged Touche Ross, a private management consultant, to examine and report on that arrangement. One of the recommendations of the report was to introduce a program management system which could be used as the basis of formal agreements between the Commonwealth and the States.[29] The recommendation was accepted and, beginning in the 1985/1986 financial year, the AAHQS has implemented a program budgeting, although it is confined to the central office.

6. Policy Making and Co-ordination

As stated previously the AAHQS has the responsibility to develop policies and to co-ordinate the plant quarantine activities carried out by the States. In developing the policies several methods are usually used.

First the information needed in formulating the policies is obtained from within the office itself, that is, from its own professional agriculturists, who can make preliminary assessments and judgements on the technical issues in entomology, plant pathology, nematology, virology, malacology, weed science, seed pathology, horticulture, and forestry.[30]

Second, the information needed may be acquired from the States' specialists who have direct involvement in plant protection activities.[31]

Third, the information may be sought from the CSIRO, universities, or even from overseas sources.

Fourth, in major issues the States give their contributions in policy making through an annual plant quarantine conference.[32] This conference is a forum for discussing the operational aspects of plant quarantine activities which can lead to policy formulation, and is attended by the Chief Quarantine Officers.

Other inputs from the States can be gained through the suggestions concerning the plant quarantine matters in the manual or the circular memoranda which are distributed internally.

With the variety methods that are used in formulating policies, it is expected that the policies can always can be accepted and implemented. Some methods of communication used by the AAHQS in the effort to co-ordinate the plant quarantine activities throughout Australia are:

a. plant quarantine manual;

b. plant quarantine newsletters;

c. circular memoranda;

d. plant quarantine training; and

e. plant quarantine conference.

The manual, which is always updated regularly, is provided primarily for the plant quarantine inspectors in the States. This manual contains, among other things, an interpretation of the legislation, the directions of treatment of plants, and procedures used in the plant quarantine activities. The manual assists the plant quarantine inspectors in fulfilling their responsibilities in airport inspections, container inspections, parcel posts, nursery stock examinations, fruit and vegetables inspection, and stored product inspection. The manual also contains an outline of the responsibilities of the plant quarantine inspectors and the legislation referred to plant quarantine.[33]

The plant quarantine newsletter is published quarterly and was first published in 1965. The newsletter contains information about events of interest which are occuring in the plant quarantine field throughout Australia.[34]

Circular memoranda, which are almost similar to the newsletters, are the oldest means of communication between the Central Office and the States. These may contain information about recent events, changing policies, new

treatment of plants.[35]

Plant quarantine training, usually lasting for a week, is also used as a means of communication to co-ordinate the plant quarantine activities. It is designed for plant quarantine inspectors with several years of experience, not for the new plant quarantine inspectors. By attending such a training it is expected they can exchange their experience with each other. The overall objectives of the training are:

> 1. to provide plant quarantine officers throughout Australia with a broad concept of plant quarantine as it operates in this country;
> 2. to provide plant quarantine officers with basic background information and so lead to a better understanding of policies;
> 3. to provide an opportunity for plant quarantine officers to briefly see how operations are undertaken at major ports;
> 4. to provide an opportunity for plant quarantine staff to exchange experience.[36]

The plant quarantine conference is a forum designed for senior administrators from each State to discuss the technical aspects of the plant quarantine activities for the input for policy development. This conference is held annually and sometimes is attended by Seniors Inspectors and highly qualified officers, such as plant pathologists and entomologists, either from the States' Departments of Agriculture, Commonwealth and States forestry services, or from other appropriate Commonwealth services such as the CSIRO.[37]

As mentioned before although the AAHQS has the responsibility to co-ordinate the operational activities of plant quarantine, it does not have any system or device to monitor the plant quarantine functions performed by the States.

In its report on the effectiveness of the administration of quarantine service, the Audit Office, in relation to the communication between the Commonwealth and the States, recommended that a management information

system be established so that the Commonwealth has the data about the activities carried out by the states. The information might be linked to financial and personnel data, so that a detailed picture of services and costs could also be presented.

Another body concerned with the relation between the Commonwealth and the States in plant quarantine matters is the Australian Agricultural Council. This Council is involved particularly in policy development, such as in deciding the funding needed in elimination of certain plant pests and diseases. This Council has several Standing Committees which may be involved in plant quarantine matters. Among them are the Entomology, the Horticulture, the Plant Production Committees. This Council and its committees, however, are not involved much in the day to day plant quarantine activities.

7. Operation

The plant quarantine activities mostly are carried out in airports and seaports, known in plant quarantine as "point of entry", but there are also activities which may be carried out in post offices and post entry quarantine stations. These activities which are aimed to prevent the establishment of new plant pests and diseases may consist of components such as:

a. inspection at points of entry;

b. inspections at points of origin;

c. controlled introduction of plants and plants products.[38]

All these systems are implemented in Australia.

The inspection at point of entry involves the inspection of plants and plant materials at the airports and seaports as their first points of arrival. This inspection is done to detect and refuse delivery of plants or plant materials which may show infestation or infection.[39] In the day to day activities, the

inspection is not confined to products of an agricultural nature, but it also includes toys, ornaments, sport goods and footwear, containers, timber cases, and dunnages, because they also may pose a plant quarantine disease risk.[40]

The inspection and certification at the points of origin is the system whereby the plants or plant materials have been inspected and certified by the plant quarantine authorities in the country of origin, to be free from pests and diseases before being sent to Australia.[41]

Controls exist for the introduction of plants and plant products by which the risk of introducing a pest or a disease has been recognised. The form of the control may vary according to the circumstances and the plant quarantine risk. They may be imported or introduced by permit, and subject to treatment upon arrival if necessary, or in the case of living plants they have to be grown in the post entry quarantine station.[42]

The responsibility for inspection is primarily with a team of plant quarantine officers at ports of entry. These officers have the responsibility to decide whether the consignments conform to the regulations, and whether their condition permit their introduction with or without treatment.

As appointed and gazetted plant quarantine inspectors, they are responsible for the enforcement of the plant quarantine regulations and any additional instructions which may be designed to prevent the introduction and spread of plant pets and diseases from other countries. Specifically their duties are :

a. In collaboration with the officials of the Commonwealth Bureau of Customs, ensure all potential carriers (i.e. cargoes, baggage, mail) are examined for plant pests and diseases amd plant materials which are restricted or prohibited under plant quarantine legislation.
b. Identification of imported plant material and preliminary identification of certain pests and diseases.
c. The examination of imported plant material with the object of determining if the materials carrying evidence of a disease, or is

visibly infested with an insect pest or is carrying any other quarantine pest or observable contaminant.

d. Inspection of imported plant material growing in post-entry quarantine, unless, under specific direction, inspection by special qualified personnel has been arranged

e. Undertaking plant quarantine clearance or released of imported goods and meeting all documentary requirements.

f. Supervising the carrying out of described safeguard necessary in the case of consignments of plant material which have been refused entry or held under quarantine.

g. Supervising or directing the proper and safe disposal, together with appropriate documentation, of all plant material refused entry for quarantine reasons.

h. Prescribing precisely in accordance with general instructions, treatments for plants and plant products and supervising their application.

i. Where necessary ensuring that all recognized precautions are taken to avoid any mishap during treatment since many materials prescribed for quarantine treatment are highly toxic.

j. Detecting illicit and illegal importation of plant material which is prohibited or restricted.

k. Maintaining good public relations with the importers, both large and small, as well as travelling public.

l. Liaison with other government and semi government officials, suh as those connected with General Quarantine, Animal Quarantine, Australia Post, Customs, Immigration. Military, Transport, State Departments of Agriculture and CSIRO.

m. Any other duty associated with the successful operation of plant quarantine.[43]

In their operations the plant quarantine officers have to cooperate with many relevant organizations, for example with the Customs, and the Department of Transport. In the policy development they may seek consultation with the research organization such as CSIRO, or with the universities.

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[1]J.R. Morschel, *The Australian Plant Quarantine Service*, (Canberra: A.G.P.S.), 1983, p. 6.

[2]P.F. Williams, " Australia's Quarantine Service- A Case Study in Intergovernmental Relations," (M. Soc. Sc. dissertation, University of Tasmania), 1983, p. 24.

[3]*Reports of the Auditor-General on Efficiency Audits: Administration of Quarantine Services, Australian Wool Corporation Property Operations, Department of Territories-A.C.T. Internal Omnibus Network (ACTION)*, (Canberra: A.G.P.S.), 1985, p. 2

[4]Senate Standing Committee on National resources, *Report on the Adequacy of Quarantine and other control measures to protect Australia's pastoral industries from the introduction and spread of exotic livestock and plant diseases*, (Canberra: A.G.P.S.), 1979, p. 59.

[5]*Review of Australian Quarantine Arrangements*, (Canberra: A.G.P.S.), 1977, p. 133.

[6]Senate Standing Committee on National Resources, op. cit., p. 67.

[7]The Department of Primary Industry,*AAHQS in ACTION*, (Canberra: the Public Relations Section, the Commonwealth of Primary Industry), 1985, p. 7.

[8]Ibid.

[9]P.F. Williams, op. cit., p. 1.

[10]"Quarantine Act 1908-1973", in *Acts of the Australian Parliament 1901-1973*, vol, 9, Part II, Section 8 A (1-3).

[11]Ibid., Part VII, Section 70 (1). [12]Ibid., Part V, Section 55 & 58.

[13]Ibid., Part VII, Section 69.

[14]Senate Standing Committee on National Resources, op. cit., p. 53.

[15]P.F. Williams, op. cit., p. 27.

[16]Department of Primary Industry,*Annual Report 1984-1985*,

(Canberra: A.G.P.S.), 1985, p. 3.

[17]Ibid., p. 65.

[18]Ibid.

[19]Senate Standing committee on National Resources, op. cit., p. 67.

[20]"Quarantine Act 1908-1973," Part III, Section 11.

[21]Senate Standing Committee on National Resources, op. cit., p. 59.

[22]*Reports of the Auditor General*, op. cit., p. 4.

[23]"Plant Quarantine inspectors Course," a paper, n. d., p. 10.

[24]"Program : Australian Agricultural Health and Quarantine Service (AAHQS)," in "Animal Quarantine and Exports Branch System Manual," n.p., n.d.

[25]*Reports of the Auditor General*, op. cit., p. 18.

[26]Ibid.

[27]"Chart of Accounts: Plant Quarantine Service," n.p., n.d., p. 1.

[28]Reports of the Auditor General, op. cit., p. 5.

[29]Information is given orally by the AAHQS officer.

[30]J.R. Morschel, op. cit., p. 35.

[31]Ibid. p 36.

[32]Ibid.

[33]Ibid., p. 84

[34]Ibid.,p.85

[35]Ibid.

[36]Ibid., pp. 85-86.

[37]Ibid., p. 85.

[38]Ibid., pp. 15-16.

[39]Ibid., p. 15.

[40]"An Outline of Plant Quarantine for the Customs Agents' Industry," a paper, n. d., p. 3.

[41]J.R. Morschel, op. cit., p. 16.

[42]Ibid.

[43]Ibid., pp. 39-40.

IV. ORGANIZATIONAL EFFECTIVENESS IN AUSTRALIA'S PLANT QUARANTINE SERVICE

1. The problems of Assessment

In the assessment the major problem is the identification of criteria for measuring effectiveness. As has been stated in the early part of this dissertation, there is no clear framework in the literature on organizational effectiveness which can be used to assess the organizational effectiveness of any organization, including plant quarantine organization. It seems the easy and objective way is to use the goal model. However, due to the nature of plant quarantine, it is not easy to determine the attainment of the goal, which in this case is the prevention of plants pests and diseases.

Using the goal model as mentioned previously, the logical criteria of organizational effectiveness for plant quarantine organization will be the number of the incidents of unprevented introduction of any plant pests or diseases, and the number has to be nil. When there is no incident, plant quarantine may be considered effective. However, it will be difficult to ascertain whether any plant quarantine organization has achieved nil of incidents. Kahn also argues that even successful plant quarantine may only delay the spread of plant pests and diseases into throughout the world.[1] It is almost impossible to prevent totally man from becoming the mechanism by which the plant pests and diseases can gain entry into any country. Using the goal model therefore no plant quarantine organization would be considered as being effective.

The use of other models, such as the system resource model is not appropriate either. As in other countries Australia's plant quarantine is a public

organization. As a public organization the acquisition of resources will not be a vital problem. Besides, as argued by Daft, resources will not necessarily assure better performance, because the resources obtained may be wasted without the achievement of the pursued goal.

The constituency model will not be appropriate either. It will be impossible for Australia's plant quarantine service to always satisfy the public, as one of its constituencies. For example, if they bring in any plants or plant materials which may pose risk to Australia's agriculture they will lose them. If they wish to import such goods the same result will occur.

The objective of plant quarantine is to prevent the introduction of exotic plant pests and diseases. It will be more useful to use a model for assessing the organizational effectiveness which can denote problems inhibiting such efforts. The model which may be used in this case is the process model proposed by Steers with the appropriate modification proposed in p. 10.

2. Organizational Characteristics

a. Structure

As has been mentioned previously, the structure of Australia's plant quarantine service involves two levels of governments-the Commonwealth and the States. At the Commonwealth level there is the AAHQS, which is responsible for the policy development and co-ordination; while at the State level there are units from the States' Departments of Agriculture which carry out the operational plant quarantine activities on behalf of the Commonwealth.

These activities are carried out in all of the airports, seaports, and post offices which are known as the points of entry according to the Quarantine Act. These activities are aimed at preventing the introduction and spread of exotic plant pests and diseases in Australia. The activities include the inspection of

incoming plants, plant materials, and related materials, such as containers, and dunnages.

In the effort to co-ordinate these activities, the AAHQS uses several kinds of communication channels, such as the circular memoranda, newsletter, manuals, the chief quarantine conference, and plant quarantine officer training.

In the AAHQS the responsibility for policy development and co-ordination of plant quarantine is discharged through one of its branches-the Plant Health and Quarantine Branch. As mentioned before, this branch has professional agriculturists whose function is to perform the preliminary assessments and to make judgments on the technical issues for the policy development. In the States there are Chief Quarantine Officers (Plants), who maintain official contact between the Commonwealth 's and other State officers. As also has been mentioned, under the Chief Quarantine Officers there are Inspectors who may be differentiated into Senior, Deputy Senior, and Inspectors. The Chief Officers hold the responsibility for all of the operational aspects of plant quarantine activities within their own State.

According to the Section 11 of the Quarantine Act, the Commonwealth, the Governor General in this case, may make an arrangement with the Governor of each State to use the State's facilities for plant quarantine purposes, and to ensure co-operation between the Commonwealth and the States in respect to plant quarantine. However, as also stated in the earlier assessments, until now there is not any such formal arrangements. The existing arrangement remains informal, although it has been performed since the establishment of the Quarantine Act. One result is the absence of a common basis for comparing the services delivered by the States on the Commonwealth behalf, as well as the absence of any monitoring instrument for those activities. This was referred to in the assessments mentioned earlier.

b. Technology/Facilities

The plant quarantine activities, as mentioned before, may consists of inspections at points of entry, inspections at points of origin, and the control of introduction of plants and plant products.

At the inspection at point of entry, when the incoming plants and plant materials are found to pose a risk to Australia's agriculture because they are infested or infected by plant pests or diseases, they may be treated, or destroyed when they cannot be treated. In these activities the service receives a great deal of co-operation from other services, such as the Customs Service.

At the inspections at points of origin, the incoming plants or plant materials before being sent to Australia had been inspected and treated if necessary, and certified by the plant quarantine authorities to be free from any plant pests and diseases. This condition makes it easier for the plant quarantine inspectors in performing the jobs.

While the activities related to those two above inspection are mostly carried out by the States, the control of introduction of plants and plant products is performed by the central office of the AAHQS. For the common plants or plant products which required import permits prior importation, the permit may be issued by the Chief Quarantine Officer in the State where the importation is to be made. The control and the permit is given to the plants which, after being assessed, will not pose risk to Australia's agriculture. Upon the arrival in Australia, such plants must be grown in post entry quarantine to be monitored whether or not they are infected by any plant disease.

To back up those activities, the service is equipped with the needed facilities, such as microscopes for inspection purposes, fumigation facilities for treatment purposes, which can be found in each plant quarantine station and post entry quarantine station in each State.

Besides these equipment facilities, those activities are also backed up with the services of plant pathologists and entomologists working in the Research Station at Weston, A.C.T. This station was established with the aimed to meet specific needs for plant quarantine operations which include:

1. prescribing suitable and acceptable treatments, particularly in relation to fumigation, seed treatment and virus elimination.
2. devising satisfactory procedures for essential plant quarantine screening of introductions.
3. reviewing continually the efficacy of existing prescribed treatments.[2]

In carrying out these activities, the service also has access to the service provided by the States' agricultural and forestry authorities and to the research organizations such as the CSIRO, through the latter's involvement in various committees set up under the Standing Committee on Agriculture, such as the Consultative Committee on Exotic Insect Pests,Weeds and Disease.[3]

The activities are legally based on the Quarantine Act, which has been amended several times since its establishment in 1908.

With all those facilities, it seems that the plant quarantine activities are given technical facilities to succeed in preventing the introduction of plant pests and diseases. However, there is a shortcoming in relation with those activities. This shortcoming, which was stated in the Senate Inquiry, stems from the inadequacy of the Quarantine Act itself. The plant quarantine officers do not have power to inspect passengers' baggage directly, but they have to rely on the assistance from the Custom officers completely.[4] Even the decision on whether the baggage may contain plants or plant materials, thus, whether or not they are subject to plant quarantine inspection, is made by these Customs officers, based on their interpretation of the declaration forms filled by the baggage owners.[5] Although the writer was advised that so far this arrangement goes smoothly, it may create problems in cases where assistance is not

available. The Review of Australian Quarantine Arrangements used the term "free runners" in relation to this question. These amount to about 60%-70& of all flight passengers.[6] Free runners may escape detection; for example there were some exotic organisms detected in New South Wales in 1984, such as the rose-grain aphid which is native to Europe.[7]

3. Environmental Characteristics

In proposing his process model, Steers notes the economics and market conditions as the environmental characteristics variables which can influence the effectiveness of organizations. In this study, however, those variables are not used, but instead the relations with the minister, the public, the other services and research organizations will be used. These variables represent the factors of the task environment for Australia's plant quarantine service. As Thompson states in his work *Organization in Action* the task environments are 'those parts of the environment which are" relevant or potentially relevant to goal setting and goal attainment."'[8] Among those other services will be the Customs Service and the CSIRO as those identified as involved in plant quarantine activities by the Senate Inquiry.[9]

a. Relation with the minister

The relation of the service with the minister may be divided into two aspects:

(a) the relation with its own Minister, or in this case with the Minister of the Department of Primary Industry which is currently responsible for the AAHQS; and

(b) the relation with the Ministers of the States' Departments of Agriculture/ Primary Industry.

An awareness of the importance of plant quarantine is required from the

Minister, so that the technical facilities for carrying out the plant quarantine activities, can always be obtained. The importance of plant quarantine was supposed to have been disregarded when the plant quarantine service was administered under the Department of Health, whose prime concern was not agricultural matters.[10] This also may be the reason that there is not any formal arrangement between the Commonwealth and the States on plant quarantine matters.

The relation between the plant quarantine service and the Ministers from the States' Department of Agriculture is through the Australian Agricultural Council. This Council provides consultation in relation to the co-ordination of the operational aspects of plant quarantine, and it is supported by a permanent technical committee called the Standing Committee on Agriculture, whose functions, among others, are:

> "... securing co-operation between the Commonwealth Government and the States and among the States with respects to quarantine measures relating to pests and diseases of plants and animals and advising Commonwealth and State Cabinet with respect thereto".[11]

The Standing Committee on Agricultural has several committees, and one of its committees, the Consultative Committee on Exotic Insect Pests, Weeds and Diseases, has the function of co-ordinating the measures for eradicating any exotic plant disease which occurs.[12]

Although the Council is consultative only, because decisions still remain with the States and the Commonwealth governments, in the absence of any formal arrangement its role becomes significant.

b. Relation with the public

By the public, here the writer means those who bring in plants or plant

materials into Australia. They may be travellers (tourists, ordinary passengers, farmers returning from travelling overseas), or they may be importers who deals with the importations of plants or plant materials. The public has been admitted as the weakest link in plant quarantine activities by the service, despite its efforts in always exploiting the latest advances in plant sciences.[13] The success of plant quarantine rests in a great measure on the public. Without their co-operation it will fail because as Khan argues, it is through carriers such as the travelling public that the plant pests and diseases can spread widely. Without the help of people, how is it possible that the Tea Blister Blight fungus, a disease which attacks tea plantations, could move from Sri Lanka to Africa?[14] The awareness and co-operation from the public will determine whether the mission carried out by the plant quarantine service will succeed.

To gain the awareness, a plant quarantine publicity campaign has been undertaken since 1952, through the publication of leaflets which are distributed for travellers entering Australia from overseas and those who move interstate or from district to district within the States.[15] In addition to the leaflets, the campaign has also been carried out through other media, such as television, and radio.[16] Despite the campaign, however, some breaches of plant quarantine legislation still occur. According to data, in 1984 there were 345 prosecutions. Unfortunately, there was not any figure obtained for earlier years, but according to the Senate Inquiry, it seems there were not many prosecutions. This was supposed to be due to the limited fine compared with the costs of the litigation.[17]

According to the writer, there is another issue which may be more important than the prosecutions, although they must not be disregarded altogether. This is to lower the numbers of the free runners mentioned previously, which according to the Review might reach 60%-70% off all

passengers. If among those runners there are some people who bring in plants or plant materials infected or infested by plant pests or diseases, they will actually pose risk to Australia's agriculture. This is only hypothetical, but it is likely to happen, remembering that there are still some exotic plant pests that have escaped control as has been mentioned previously.

To avoid this the publicity being carried out by the service at this time to increase the public awareness of plant quarantine, must be increased. Whenever they bring in to Australia any plants or plants materials, the public must be encouraged always to conform to the existing plant quarantine legislations.

c. Relations with other service and research organizations

The plant quarantine activities involve other Commonwealth services or departments. Some of them were acknowledged in the Senate Inquiry. Among those services are the Customs service, the CSIRO, the Department of Transport, and the Department of Foreign Affairs.[18]

The involvement of the Customs service in the plant quarantine activities determines to a great extent the performance of the plant quarantine service. This is due to the sole right of this Customs officials to inspect the incoming passengers' baggage, mail, parcels, and other imported materials, for example, so that the plant quarantine officers have to operate in an advisory role in respect of processing the above materials.[19]

As stated above this may cause the failure of the plant quarantine activities where the co-operation is unavailable, which worried the Senate Inquiry.[20] To improve this condition the Senate Inquiry recommended the Quarantine Act should be amended to give the plant quarantine officers the power needed.

The involvement of the CSRIO is mostly through its contribution of the results of its researches in control and eradication matters and also through its membership in the committees of the Standing Committee on Agriculture. Although the involvement of this service is not always directed to the plant quarantine activities, its contribution can be considered as important. However, since plant quarantine research needs are not always able to be obtained from either the CSIRO or other research organizations, this motivates the plant quarantine service to do its own research.

The involvement of the Department of Transport is mostly concerned with the provisions of facilities needed in plant quarantine, such as incinerators at the airports or seaports as points of entry. These facilities are important in the plant quarantine activities, because they are needed when there are plants or plant materials infested with a disease which cannot be treated, have to be destroyed. If they have to destroyed in other place, this may give the disease a chance to spread.

The Department of Foreign Affairs is involved in the distribution of information concerning plant quarantine overseas. This involvement may be considered important too, in order to create an awareness of plant quarantine in overseas people who intend to come to Australia, so they will not bring in any plants or plant materials which may pose risk to Australia's agriculture.

In these interrelationships with other organizations the writer is advised that generally there is good co-operation. However, particularly in relation with the Customs service, the existing role reliance on them should not be continued and plant quarantine officers should be given the same power.[21]

4. Employee Characteristics

As has been mentioned in the earlier part of this dissertation, the employees in the plant quarantine service may be divided into two groups-those who are involved directly, and those indirectly involved in the activities. Without lessening the importance of the other employees, such as the clerk, they will not be emphasized in this discussion. Those involved directly in the activities are gazetted as plant quarantine officers, including the Director of plant quarantine service, either they are Commonwealth or State employees.

In order to be able to carry out their responsibilities, these plant quarantine officers must have certain knowledge, such as:

- they must have sound knowledge of the plant quarantine legislation;
- they must have knowledge of fumigation and disinfection technique;
- they must have some knowledge of plant pathology, entomology, and knowledge of plants and seeds;
- they especially must be able to assess healthy plants.[22] However, as it was found in the efficiency audit, the Commonwealth has not laid down any minimum qualifications for plant quarantine officers, instead the Commonwealth has accepted the requirements developed by the States. This results in the variety of the qualifications required to be plant quarantine officers in each State, as can be seen from Table 1.

Although the qualification requirements have not been given by the Commonwealth, the Commonwealth has prepared a manual for training in plant quarantine. All training carried out by the States is scrutinized by the Commonwealth first.[23] Since the knowledge mentioned above is important for carrying the plant quarantine activities, it should be taken as the minimum requirement for plant quarantine officers. The Efficiency Audit, however, found that there was no set program of training courses. They doubted that the training conducted so far would ensure that all the quarantine staff would

possess that knowledge required. Thus it was recommended by the Audit that the Commonwealth play a greater role in determining the structure and content of training programs. The writer agrees with this recommendation, and if the training can be conducted by the Commonwealth itself, instead of by the States, it will give the greater assurance of the uniformity and consistency demanded in the Audit.

Table 1. Requirements required as plant quarantine officers by the States

Level	Needed in the State
- Rural background	Victoria, Tasmania
- 4 th Year School	Tasmania
- Achievement Cert. 5 Passes	Western Australia
- TAFE Certificate Horticulture Agriculture	New South Wales, Western Australia, Northern Territory
- Assoc. Diploma	New South Wales, Queensland
- Diploma	New South Wales, South Australia
- Degree	New South Wales, South Australia
- In-service experience	Northern Territory
- Mandatory in-service training Pass	South Australia

Source : *Reports of the Auditor General on Efficiency Audits*, p. 18.

Other employees who need higher qualifications are those who are involved in backing up the activities, such those who work at the Plant Quarantine Research Station, and in policy development. At the present time there are some plant pathologists and entomologists who work in those area.

To carry out plant quarantine activities dedication and devotion are needed due to their nature. As Morschel observes, most of the plant quarantine employees spend a lifetime on the job, which may indicate that there is job

satisfaction.[24] With the existence of the job satisfaction from the employees, they can be supposed to have given their efforts as best as they can, as expected by Steers with his process model.

No assessment of the performance of the plant quarantine officers in carrying out the plant quarantine activities is included in any earlier assessments. In this study, due to the lack of time, it was not conducted either. The writer was advised that so far there have never been serious problems, such as an employee strike, which may cause an incident of introduction of plant pests or diseases, and using Morschel's impression, generally it may be inferred that there are no problems in relations with the employees which may inhibit the continuity of the activities.

5. Managerial Policies and Practices

Policy development and co-ordination of the plant quarantine activities throughout Australia are the only variables that will be emphasized here. These are the responsibility of the Commonwealth.

In the other part of this dissertation, it has been stated that in making policies on plant quarantine, the Central Office in Canberra may use either of the following methods; the data needed for making policies may be obtained from its own staff, that is, from the professional agriculturists working at the Central Office; and they also may be gained from the staffs in the operational level, that is, from the Chief Quarantine Officers and the other plant quarantine officers. This is on the understanding that the policies can always be implemented in the operational level.

The writer was advised that the policies are flexible so that they may be implemented in accordance with given situation to give more chances for success. This happens, for example, with the procedure for inspections, which

are not so detailed, in order to give the opportunity for the officers' initiatives.

In order to co-ordinate the activities some methods of communication may be undertaken, such as through the manuals, circular memoranda, newsletters, and the chief quarantine officers conference. In the chief quarantine officers conference the technical matters of plant quarantine are discussed, and the results of the conference may become policies to be implemented.

As advised by the service, generally it seems that there is good communication between the Commonwealth and the States. However, as stated earlier, since no formal arrangement between the Commonwealth and the States in the provisions of plant quarantine service exists, and since there is no monitoring device for the services delivered by the States, the settling of these matters must be given priority. That will give the Commonwealth legal basis and a device for monitoring the service delivered by the States on behalf of the Commonwealth in respect to plant quarantine.

The existing process in policy development, participation in policy making at the operational level, and good communication all facilitate the prevention of the introduction of plant pests and diseases as it was desired when the plant quarantine service in Australia was created.

6. Conclusion

Having discussed the assessment of organizational effectiveness of Australia's plant quarantine service some conclusions may be drawn.

Although organizational effectiveness has been studied for many years by social scientists, there appears still no clear framework of criteria for assessing organizational effectiveness of any organization, including Australia's plant quarantine service. However, the process model proposed by Steers, which is modified so that it covers the factors of the task environment of

the service, together with the way the service is organized and discharges its responsibilities, may be used in assessing the organizational effectiveness of the concerned organization.

Due to the nature of plant quarantine, the goal model, the system resource model, and the constituency model may not be used. It will be more advantage us to use a model which can denote the problems inhibiting the prevention of introduction of exotic plant pests and diseases as the goal of plant quarantine. The model used may be the model mentioned above. Assessed with this model, Australia's plant quarantine service as a whole may be considered effective. There seems to be few problems which may inhibit the efforts in preventing the introduction of the plant pests and diseases. However, some issues, all of them were also given attention in earlier assessments of the service, remain to be settled: to formalise the arrangement for the States to provide services on the Commonwealth's behalf; to established a monitoring device for the services delivered by the States; and to amend the Quarantine Act to give the plant quarantine the more needed powers.

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[1]See pp. 6-7.

[2]J.R. Morschel, *The Australian Plant Quarantine Service*, (Canberra: A.G.P.S.), 1983, p. 97.

[3]Ibid., p. 100.

[4]Senate Standing Committee on National Resources, *Report on the Adequacy of Quarantine and other measures to protects Australia's pastoral industries from the introduction and spread of exotic livestock and plant diseases*, (Canberra: A.G.P.S.), 1979, p. 53.

[5]*Review of the Australian Quarantine Arrangements*, (Canberra: A.G.P.S.), 1977, p. 65.

A.G.P.S.), 1977, p. 65.

[6]Ibid., p. 106.

[7]Department of Primary Industry, *Annual Report 1984-1985*, (Canberra: A.G.P.S.), 1985, p. 72.

[8]James D. Thompson,*Organizational in Action: Social Science Bases of Administrative Theory*, (New York: Mc. Graw-Hill Book Company), 1967, p. 27.

[9]Senate Standing Committee on National Resources, op. cit., pp. 12-13.

[10]Ibid., p. 60.

[11]P.F. Williams, "Australia's quarantine Service-A Case Study in Intergovernmental Relations," M. Soc. Sc. dissertation, University of Tasmania, 1983, p. 30.

[12]Ibid., p. 60.

[13]*Australian Plant Quarantine Service*, (Canberra: A.G.P.S.), 1981, n. p.

[14]Robert P. Kahn, " Plant Quarantine: Principles, Methodology, and Suggested Approaches," in William B. Hewitt, and Luigi Chiarappa, *Plant Health and Quarantine in International Transfer of Genetic Resources*, (Cleveland, Ohio; CRC PRESS, Inc.), 1977, p. 292.

[15]J.R.Morschel, op. cit., p. 86.

[16]Commonwealth Department of Health, *Annual Report of the Director-General of Health 1979-1980*,(Canberra: A.G.P.S.), 1980, p. 10.

[17]Senate Standing Committee on National Resources, op. cit., p. 56.

[18]Ibid., pp. 12-13.

[19]Ibid., p. 12.

[20]Ibid., p. 53.

[21]Ibid., p. 12.

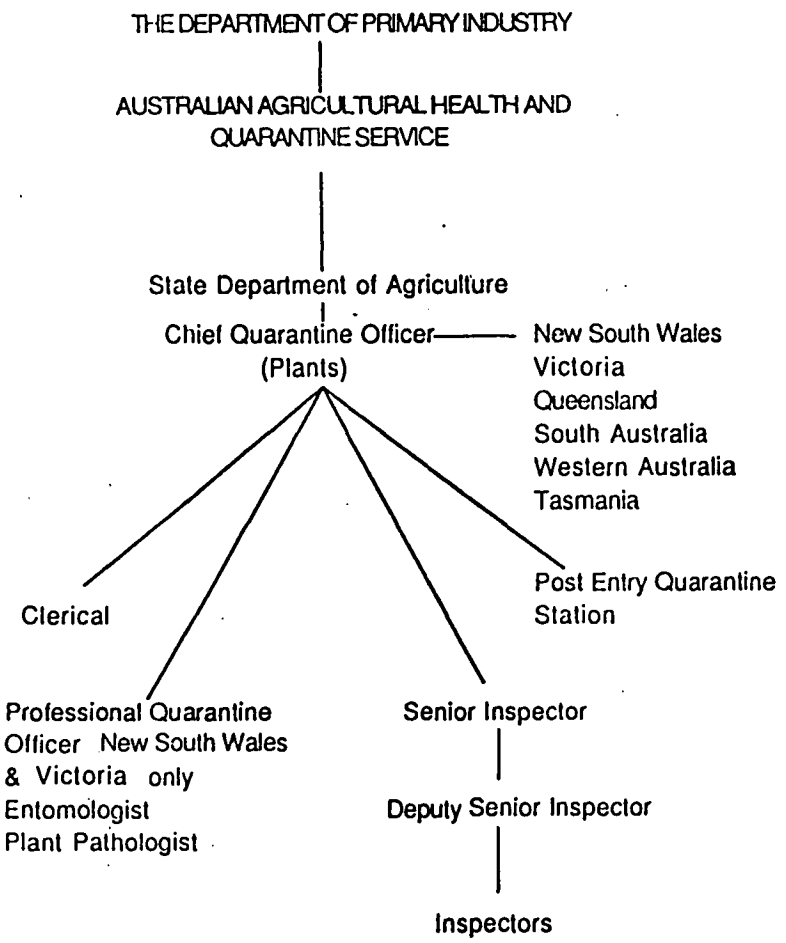
[22]J.R. Morschel, op. cit. p. 39

[23]*Reports of the Auditor General on Efficiency Audits: Administration of Quarantine Services, Australian Wool Corporation Property Operations, Department of Territories-A.C.T. Internal Omnibus Network (ACTION)*,(Canberra: A.G.P.S.), 1985, p. 18.

[24]J.R. Morschel, op. cit., p. 37.

APPENDIX 1

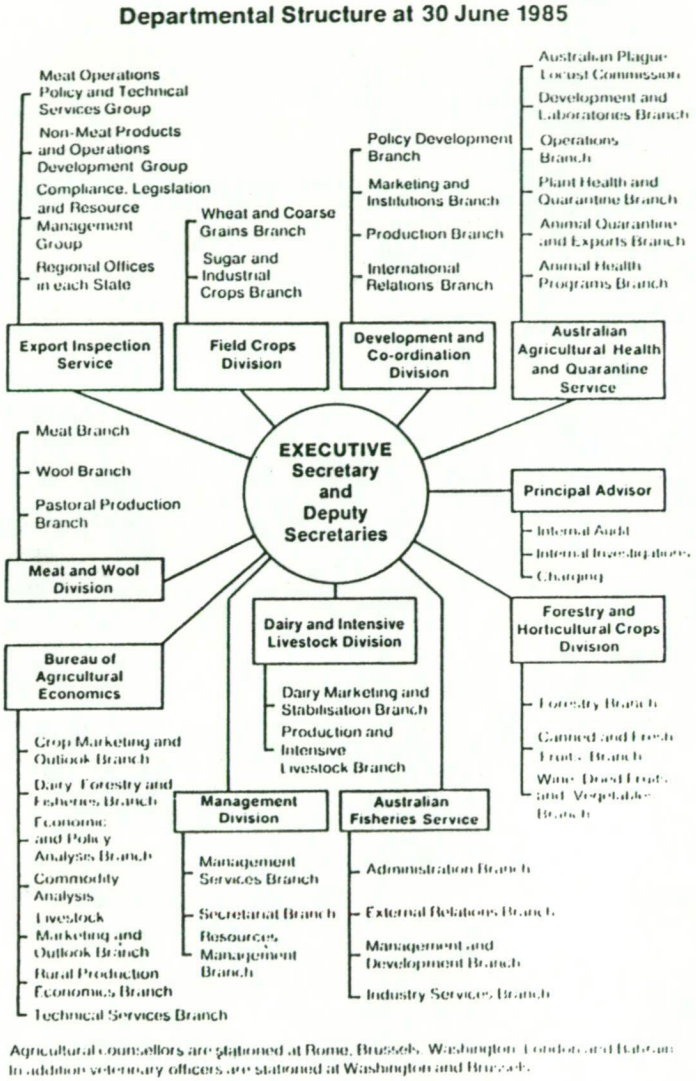
Existing Australia's Plant Quarantine Service
Commonwealth/State Structure



Source: The Review of Australian Quarantine Arrangements; and the Department of Primary Industry-Annual Report 1984/85.

APPENDIX 2

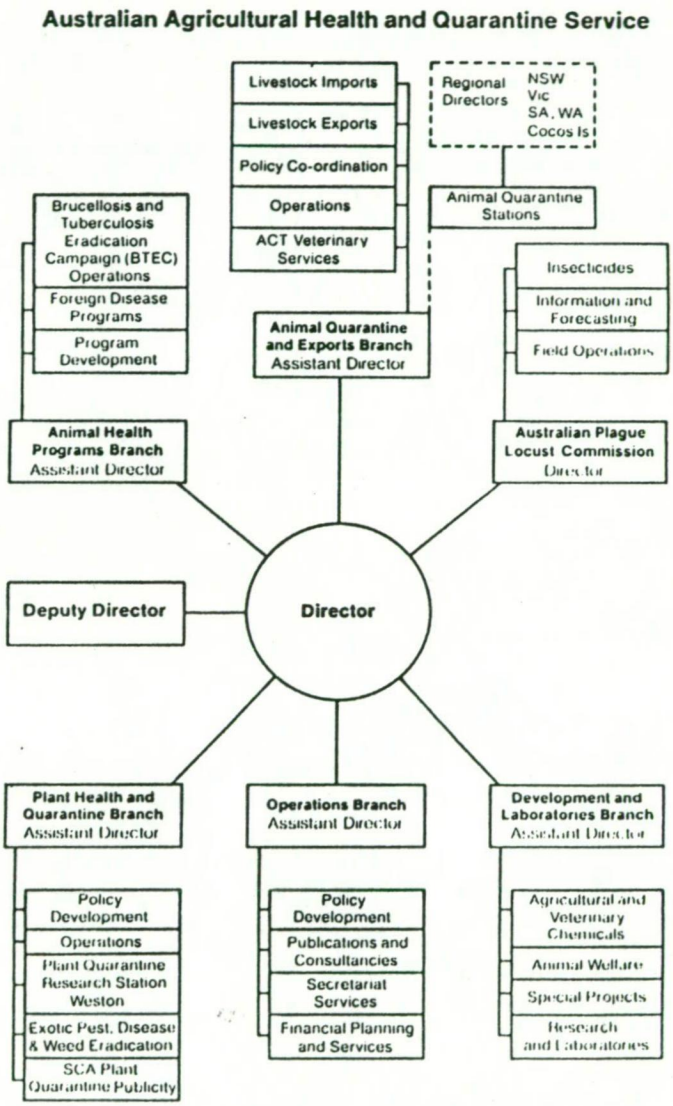
The Organizational Structure of the Department of Primary Industry



Source: The Department of Primary Industry-Annual Report 1984/85

APPENDIX 3

The Organizational Structure of the Australian Health and Quarantine Service



Source: the Department of Primary Industry-Annual Report 1984/85

APPENDIX 4

The Operational Cost of Plant Quarantine in Australia
1981/82-1985/86 (in AS $ 1000,00)

	1981/82	1982/83	1983/84	1984/5	1985/86
New South Wales	2,097	2,562	2,718	2,900	2,900
Victoria	1,673	2,122	2,546	2,650	2,710
Queensland	1,051	1,340	1,400	1,504	1,570
Western Australia	600	806	952	1,020	1,110
South Australia	470	615	700	780	800
Tasmania	186	222	270	300	300
Northern Territory	559	626	654	750	770
	6,456	8,292	9,240	9,904	10,160

Source: "Lecture Notes : Plant Quarantine Finance Expenditure" in "Plant Quarantine Inspectors Course 1985" , a paper.

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