Food Information Systems: Summary and Analysis

August 1976

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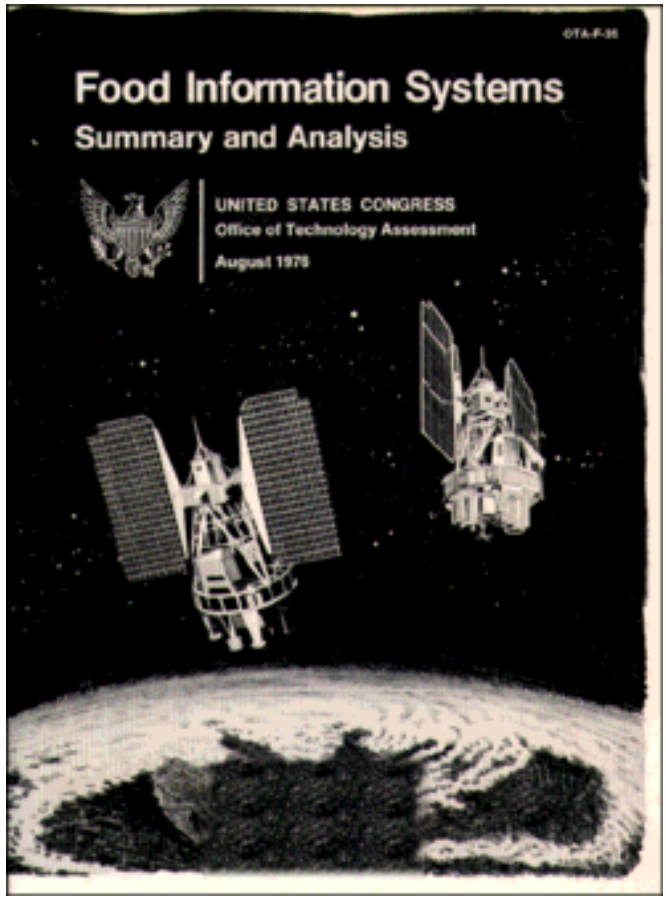

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CONSULTANTS

Raymond Hoehle
Walter Wilcox

*Committee membership at the time the Food Advisory Committee Report was prepared and submitted to the Office of Technology Assessment, June 1975.
● *Member through Mav 1975.

Congress **of** the United States
OFFICE OF TECHNOLOGY ASSESSMENT
WASHINGTON, D.C. 20510

EMILIO DADDARIO
DIRECTOR
DANIEL V. **DE SIMONE**
DEPUTY

July 22, 1976

The .Honorable Olin E. Teague
Chairman
Technology Assessment Board
Office of Technology Assessment
Congress of the United States
Washington, DC 20510

Dear Mr. Chairman:

The world food situation has been drastically altered by a series of major events that converged in 1972 and 1973. The consequences of these events have demanded new policies. To develop and carry out these policies requires more timely and accurate information.

Congress is substantially dependent upon data developed and evaluated from information resources outside the Congress. Until 1973, with our food policies based upon "burdensome surpluses," our information needs seemed to be well taken care of. No one, inside or outside the Government, predicted that the events and policy decisions of 1972 and 1973 would lead to sharp increases in the cost of food and farm inputs and shortages of such key production supplies as fuel, protein meals, and fertilizers. It was this apparent breakdown of information that led me to request, and the chairman of the Senate Committee on Agriculture and Forestry to- endorse, that OTA identify the key information systems and determine how well they were serving decision makers; identify defects in these systems; and suggest options for Congress to consider to improve these information sources. I am pleased that the summary and analysis of this study, as presented during hearings by the OTA Board, can be transmitted to the Congress.

I have been an active participant in this study. It was my privilege to chair four days of hearings for OTA's Board on food information systems. These hearings were triggered by the report of OTA's Food Advisory Committee and afforded me the opportunity to dialogue with the most knowledgeable individuals on this subject. The impressive mix of people who helped in this study has given this document a balance and diversity of views.

The most feasible option seems to be to make perfecting changes in the existing system rather than to try to develop a single integrated worldwide system or to rely on the initiative of existing institutions to make these improvements.

The specific areas for improvement to the existing information resources are relevant and useful. Indeed, the utility is already evident by the

uses Congress has made of preliminary assessment material:

1. Background material for the U.S. congressional delegation to the 1974 World Food Conference, which supported Conference Resolution XVI to establish an early warning and agriculture information system;

2. Congressional hearings;

   a. Subcommittee on Foreign Agriculture Policy of the Senate Committee on Agriculture and Forestry on "Implementation of World Food Conference Recommendations" and "Improving the Coordination of U.S. and Foreign Agricultural Policy."
   b. Subcommittee on Census and Population of the House Committee on Post Office and Civil Service on 'The Need for Improvement and Coordination in Federal Government Statistics";

3.' HR12397, introduced by Congressman Neal Smith, and S3215, which I introduced "to relieve the Secretary of Commerce of the responsibility for taking Censuses of Agriculture every fifth year and require the Secretary of Agriculture to collect comparable information using sampling methods."

4. The Senate Select Committee on Nutrition and Human Needs for a staff report on 'The U.S. , FAO, and World Food Politics: U.S. Relation with an International Food Organization."

In addition, the chairman of the Senate Committee on Agriculture and Forestry and I, as chairman of the Joint Economic Committee, have asked Secretary of Agriculture Earl Butz to respond to suggestions made by participants in the Technology Assessment Board hearings, encouraging USDA to make certain improvements.

As the OTA report indicates, substantial progress has already been made to improve the U.S. and world food information systems since 1973, in part as a result of OTA studies, hearings, and staff interaction with USDA personnel. These changes include: modifying the agricultural attache system; improving staff analytical competence; upgrading publication and eliminating duplication; attempting to get better information on the Soviet food situation; releasing more timely crop forecasts; collecting data from new areas; and using modeling and remote sensing technologies.

I will follow with interest continued improvement along the lines suggested by the five areas that the OTA study emphasizes:

1. Improving the accuracy and timeliness of U.S. food and agricultural information systems.

2. Strengthening the U.S. role in a world food information system.

3. Increasing congressional staff analytical capabilities,

4. Increasing the integration of nutrition and the consumer,

5. Accelerating the use of advanced technologies.

I plan to call this report, along with suggestions for action, to the attention of the chairmen of the relevant committees of the Congress, I look forward to continued interactions between these committees and the OTA staff to help implement the alternatives in this report.

Sincerely,

Hubert H. Humphrey

CONGRESS OF THE UNITED STATES
OFFICE OF TECHNOLOGY ASSESSMENT
WASHINGTON, D.C. 20510

EMILIO Q. DADDARIO
DIRECTOR
DANIEL V. DE SIMONE
DEPUTY DIRECTOR

July 22, 1976

The Honorable Olin E. Teague
Chairman
Technology Assessment Board
Office of Technology Assessment
Congress of the United States
Washington, D.C. 20510

Dear Mr. Chairman:

I am pleased to submit OTA's eport entitled "Summary and Analysis of the Office of Technology Assessment Hearings on Food Information Systems, " which was requested by Senator Hubert H. Humphrey, OTA Board member, and endorsed by Senator Herman Talmadge, Chairman of the Senate Committee on Agriculture and Forestry.

This summary and analysis was prepared by the Office of Technology Assessment, based upon material developed by its Food Advisory Committee, consultant and contractor reports, and four days of Board hearings. The complete record of these hearings and the material that triggered these hearings is included in Food Information Systems: Hearings Before the Technology Assessment Board of the Office of Technology Assessment, Congress of the United States, Ninety-Fourth Congress, First and Second Sessions, September 24, 25, and December 10, 1975, February 4, 1976.

With the approval of the OTA Board, as indicated at its July 21, 1976 meeting, Senator Humphrey will forward the hearings document and this summary and analysis to the relevant committees of the Congress.

Sincerely,

EMILIO Q. DADDARIO
Director

PREFACE

Senator Hubert H. Humphrey, as a member of the Technology Assessment Board, Office of Technology Assessment (OTA) in a letter of January 22, 1974, requested "an OTA assessment of agricultural information systems and their adequacy for. . agricultural policy planning. " This request was endorsed by the Senate Committee on Agriculture and Forestry. The OTA Board approved this request on February 6, 1974.

The principal activity of the study was to review food information systems in order to isolate and evaluate those significant to the development of food legislation and related congressional policymaking.

The goal was to develop options that Congress could consider to improve the usefulness, timeliness, and reliability of information for policymaking, budget formulation, legislation, and oversight in the food area.

An OTA Food Advisory Committee was formed. In addition, OTA staff, assisted by three contractor studies and consultants, developed and prepared background material for the committee's use. The committee, relying on staff and contractor materials, prepared and submitted a report to the Technology Assessment Board entitled "Food, Agriculture, and Nutrition Information Systems: Assessment and Recommendations. " This report became the basis for 4 days of hearings held by OTA's Board on September 24 and 25 and December 10, 1975, and February 4, 1976. '

This document is a summary and analysis of the hearings record which directly or indirectly includes all the relevant material acquired in this study.

*Food Information Systems. Hearings before the Technology Assessment Board of the Office of Technology Assessment, Congress of the United States, Ninety-Fourth Congress, First and Second Sessions. Washington, D. C.: U.S. Government Printing Office, 1976. (Hereinafter referred to as "Hearings.") The Food Advisory Committee report is found in Hearings, pp. 4-36.

ACKNOWLEDGMENTS

The food program staff and the Food Advisory Committee of the Office of Technology Assessment (OTA) received advice and assistance from OTA and congressional staff members, Federal agency officials, individuals from the private food sector, farm organizations, consumer groups, experts from international organizations, and widely known researchers, Some were advisors, some were the subjects of interviews, others assisted in review, and others helped in numerous ways essential to a balanced understanding of the complex issues involved in this study of food information systems.

Their assistance is acknowledged. Likewise, the time made available and the effort put forward on behalf of OTA and the Congress is appreciated.

The views expressed in this report are solely those of OTA and should not be construed as those of any individuals or groups listed in appendices I and II.

HIGHLIGHTS

The major food information systems are operated by the U.S. Department of Agriculture (USDA) and the Food and Agriculture Organization of the United Nations (FAO). The systems maintained by individual countries, international organizations, and the private sector either are limited to their specific needs or use USDA and/or FAO data as their benchmark. (Page 7)

The Foreign Agricultural Service (FAS), Economic Research Service (ERS), and Statistical Reporting Service (SRS) are the key USDA units responsible for operating national and worldwide systems. This study examines the improvements made in these units since the apparent informational breakdown of 1972-73. Some of these improvements are: modifying the agricultural attached system; improving staff analytical competence; upgrading publications and eliminating duplication; attempting to get better information on the Soviet food situation; releasing more timely crop forecasts; collecting data from new areas; and using modeling and remote-sensing technologies. (Pages 7-25)

Deficiencies that persist are grouped into four categories:

(1) poor national systems, upon which USDA must depend;

(2) collection of inadequate and/or obsolete data;

(3) inadequate analysis, especially by the overseas network of agricultural attaches; and

(4) USDA's fragmented organizational structure, which hinders effectiveness and promotes institutional conflicts of interest. (Pages 25-29)

The study discusses a variety of alternatives that could be taken to correct these deficiencies. A number of specific proposals are reviewed in the general areas of improving the accuracy and timeliness of USDA's system (Pages 34-4o); integrating nutrition information into USDA'S system (Pages 40-43); and using advanced technologies (Pages 43-60).

The OTA study does not explore the FAO system in the same detail as the USDA system. It notes that the principal improvement has been the increased attention to the establishment of an Early Warning and Agricultural Information System. The 1974 World Food Conference emphasized the important relationship of better information to the world food situation. (Pages 61-68).

The OTA study suggests that the United States can play a key role in helping FAO and the developing countries to improve their information systems. (Pages 68-70)

Attention was given to the suggestions that Congress might increase its analytical capability. The report stresses that this need not imply additional personnel but that this increased capability could be obtained through more efficient use of the resources at the Office of Technology Assessment, General Accounting Office, Congressional Research Service, and others such as the land-grant university system. (Pages 71-73)

The magnitude of the demand placed upon Congress to deal with food issues can be seen from the analysis of the 1,831 and 1,725 bills and resolutions of the 93rd and 94th Congresses. (Pages 73-76).

CONTENTS

Chapter I

INTRODUCTION

BACKGROUND

Congress is dependent essentially upon noncongressional resources for food, agriculture, and nutrition information. Prior to 1972, Congress appeared to be well served by these information sources. In mid-1972, however, the world food situation changed within a 2-month period as world food production declined for the first time in many years at a time of rapidly expanding demand. World food reserve stocks were reduced to a historically low level of less than a 30-day supply. (See figure 1.)

The events responsible for these cataclysmic changes have been well chronicled. They include:

- Large purchases of wheat by the Union of Soviet Socialist Republics under conditions of semisecrecy.
- Increased foreign demand for U.S. soybeans because of the failure of the Peruvian anchovy catch.
- Increased U.S. food exports to all parts of the world, due in part to widespread inflation, U.S. dollar devaluation, and wide shifts in monetary exchange relationships.

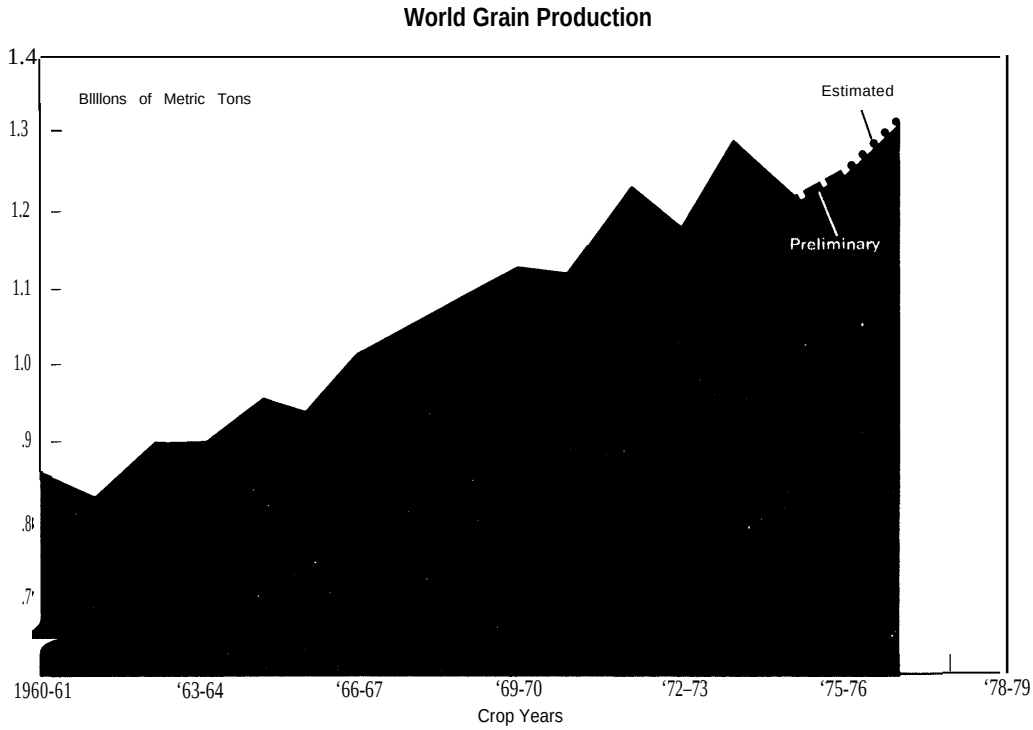
The phenomenal increases in prices of grains and soybeans in the 1972-73 crop year were not predicted by analysts in the Department of Agriculture or in land-grant universities. (See figure 2.) Members of Congress had no independent means for dealing with the food policy issues which arose at that time. It was this apparent breakdown in the information systems on which Congress had traditionally depended which led to a request that the Office of Technology Assessment (OTA) analyze the adequacy of these resources.

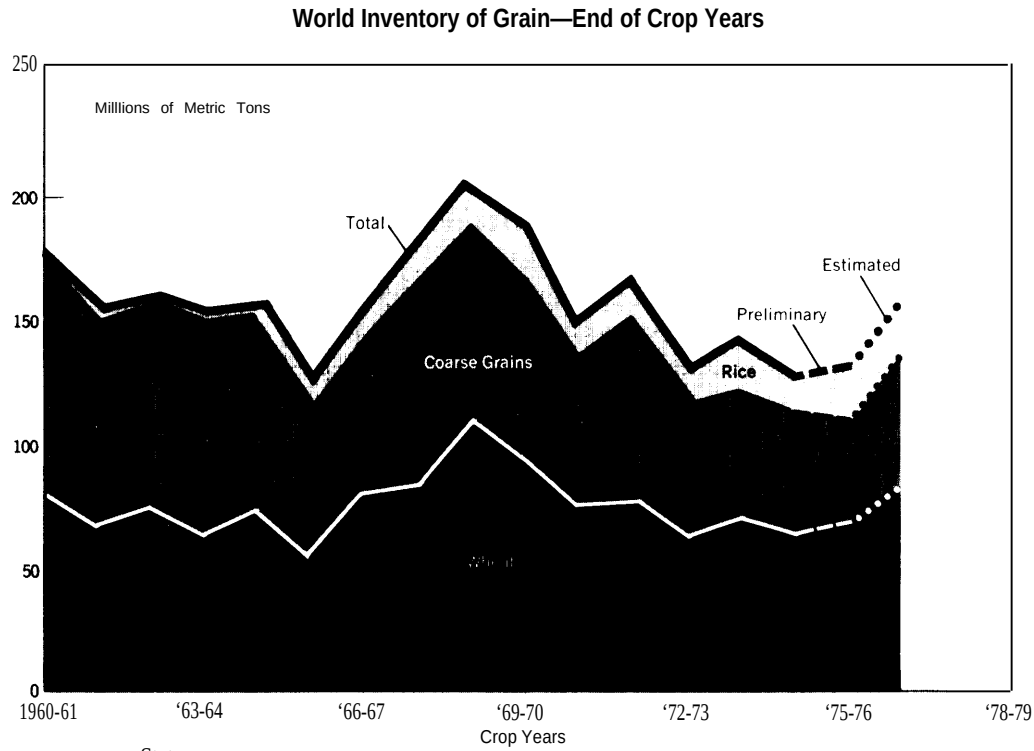
The current information flow to the Congress was never designed to operate as a total system but rather represents a historical accretion of segments based on multiple uses and purposes which are often-conflicting.

PURPOSE

The events of 1972 and 1973 led to sharp increases in the cost of food and farm inputs, resulted in shortages of such production supplies as fuel, protein meals, and fertilizers, and raised a number of questions such as:

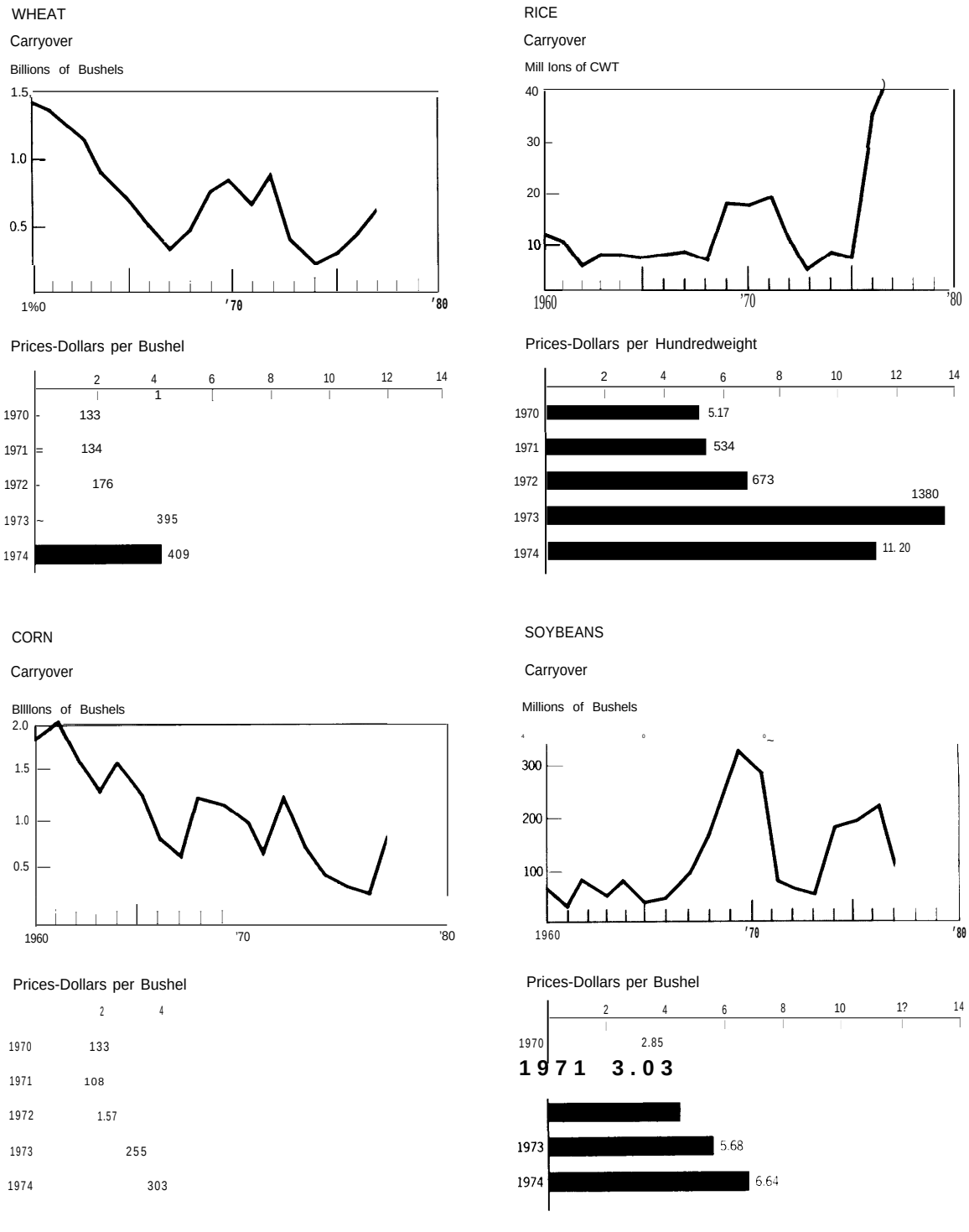
Figure I.—World production and stocks of major grains 1960-76





SOURCE: United States Department of Agriculture

Figure 2.—Carryover of major U.S. grains and soybeans, 1960-75 crop years, with year-end price averages, 1970-74



SOURCE United States Department of Agriculture

- **Why had the U.S. food and agriculture information systems failed to give warning of the impending shortages?**
- **Are existing food and agriculture information systems adequate? Do they meet today's needs?**
- **Have appropriate steps been taken to correct the deficiencies that existed in 1972–73?**

OTA's analysis, guided by its Food Advisory Committee, addressed these questions.

Dr. Clifton R. Wharton, Jr., chairman of OTA's Food Advisory Committee (FAC), noted the limitations of the study in his preface to the committee's report:

> While the committee recognized the ideal would be to address the needed improvements in the total system, we realistically concluded that an adequate assessment of the total information systems would have required greater resources and more time than was available. The committee, therefore, chose to concentrate its attention on a limited set of recommendations. Two criteria were employed: Those areas which are most amenable to congressional action and those which in the committee's judgment most urgently require attention.
>
> Our focus was also limited to the information systems rather than the analysis of the information generated by the systems, even though past problems often have been due more to poor analysis than to deficient informational

SCOPE

An identification, examination, and evaluation of the key food information systems was made in order to determine:

- **The significant food information systems**

  This involved identifying key systems and determining how well they serve decisionmakers. These systems were probed in terms of the information they provided—for example: type and nature of the information, processes and procedures used to obtain information (including frequency, timeliness, quality, format, and availability), and use and dissemination practices.

IHearings, p. 5.

- **Deficiencies in existing information systems**

  This task focused on the gaps, deficiencies, redundancies, and bottlenecks that might impede decisionmaking, Identification of defects led to consideration of options for improvements.

- **Options**

  This task identified and analyzed options that could improve existing information systems, taking into account the numerous recommendations made to OTA.

METHODOLOGY

The focal point of this study was OTA's Food Advisory Committee, working with OTA staff and consultants. In addition, contractor reports were utilized. Each of the contractors made a contribution toward OTA's preparation of a preliminary definition of the study:

Michigan State University provided an overview of the total system and examined analytical techniques.

The Futures Group pinpointed some of the key issues for which Congress evidenced information needs,

Cantor Associates explored information needed to assist the Congress in developing an improved nutrition information system.

OPTIONS

During the course of this study, recommendations for correcting the deficiencies in the existing food information systems were made to OTA. These recommendations helped to develop three options for congressional consideration:

1. Reliance on existing agencies to initiate improvements;

2. Development of a single integrated world food information system; and

3. Perfecting changes in existing systems.

Option 1: Reliance on Existing Agencies To Initiate Improvements

This option would imply that the events which occurred in 1972-73 were unique and that countries and organizations were rapidly making the

needed changes and adjustments. However, events exacerbating the world food situation have continued to occur. The margin of error in the world's food supply is now less than 5 percent, reserve stocks have been reduced to less than a 30-day supply, and the number of Most Seriously Affected (MSA) countries has increased from 33 to 44. Likewise, although improvements are being made to the existing system, the OTA study participants felt additional steps to correct deficiencies were needed.

Option z: Development of a Single Integrated World Food Information System

This option would require the development of a worldwide system within which: 1) a congressional unit, 2) linked to a quasi-independent unit within USDA, would serve as the point of contact for the United States, 3) with both tied to a world food information system.

The advantage of this approach is that "a system" would be idealized. However, this option has several disadvantages: the impracticality of its implementation in the near future; the political sensitivities to be encountered in getting such major participants as the Union of Soviet Socialist Republics and the People's Republic of China into the system; as well as the expected enormous cost of correcting existing deficiencies in order to make the system effective and efficient.

Option 3: Perfecting Changes in Existing Systems

Due to the fragmented nature of the system, it seems more, practical to make perfecting changes in the key existing systems than to try to create a new system. Likewise, suggested improvements to subordinate systems will, in the long run, improve the world food information flow.

Synthesizing the principal findings, conclusions, and recommendations, OTA found that there were five major areas where specific opportunities for improvements might be considered. Within each of these, several specific opportunities exist for action. Some of these improvements require legislation; others do not. These five areas are:

1. Improving the accuracy and timeliness of U.S. food and agriculture information systems.
2. Strengthening the U.S. role in a world food information system.
3. Increasing congressional staff analytical capabilities.
4. Increasing the integration of nutrition information.
5. Accelerating the use of advanced technologies.

Chapter II

EXISTING INFORMATION SYSTEMS

INTRODUCTION

The U.S. Department of Agriculture (USDA) and the Food and Agriculture Organization of the United Nations (FAO) are the major institutional sources for world food and agricultural information. Other institutional sources-such as national systems, international organizations, and the private sector-either have perspectives limited to their particular needs or use USDA and FAO data as their benchmark for further analysis. Likewise, USDA and FAO draw upon such outside sources as the International Wheat Council[1] and cooperate and share information from other international organizations,[2] U.S. executive agencies, s national governments, and multinational grain exporters. A

The thorough review of world agricultural information systems prepared for OTA by Mr. Howard Hjort, Schnittker Associates, reinforces this point.

> While many private and public organizations operate partial world agricultural information systems, only two operate full-fledged systems—the United States Department of Agriculture (USDA) and the Food and Agriculture Organization of the United Nations (FAO). USDA and FAO collect, maintain, and publish world agricultural statistics; develop and maintain world, regional, and countrv supply-demand estimates for agricultural commodities; continually analyze the supply-demand balances and the factors or events influencing supply and demand; and release reports containing the results of their assessments of the current situation, near-term and longer range outlook for food and agriculture. [5]

NOTE: Footnotes appear at end of chapter.

He also noted the dependence of USDA and FAO on other sources:

> Both USDA and FAO depend heavily upon national agricultural information systems of varying sophistication and reliability, but both have the analytic capability to develop current supply-demand estimates in those situations where the national agricultural information systems fail to generate timely or reliable estimates. USDA and FAO draw upon sources outside their own system for agricultural information and intelligence.[6]

This summary and analysis focuses on USDA's and FAO's food information systems. To appreciate suggested changes requires an understanding of the existing systems and their deficiencies. Participants in OTA's study provided insights into the nature of the USDA and FAO systems, highlighting both the strengths and weaknesses of these systems and suggesting a number of improvements for OTA to review and include in its options for possible congressional action. T

The USDA system will be discussed first, followed by a review of the FAO food information system.

THE USDA SYSTEM: DEFICIENCIES AND OPTIONS FOR IMPROVEMENT

Responsibility for the System

The Department of Agriculture is the only operator of both a national and a world agricultural information system. The responsibility for the world system rests with two USDA agencies, the Foreign Agricultural

Service (FAS) and the Economic Research Service (ERS).[8] In addition, the Statistical Reporting Service (SRS) provides time series data that, although limited to domestic information, is invaluable to FAS and ERS in their activities.[9]

The agricultural attached network of FAS provides foreign agricultural statistics and intelligence, and the Foreign Commodity Analysis Unit maintains, analyzes, and publishes world agricultural statistics and reports on the situation and outlook for major commodities. The Administrator of FAS reports to the Assistant Secretary for International Affairs and Commodity Programs.[10]

Mr. David Hume, Administrator of FAS, presented a detailed description of the Foreign Agricultural Service (see figure 3), noting that of FAS personnel, 125 are stationed overseas as agricultural attaches at American embassies and consulates and 63 foreign posts.[11] The functions of FAS are widespread, including food aid, market development, international trade policy negotiations, a Commodity Credit Corporation (CCC) export credit program, intelligence gathering, and export reporting. Commodity analysis is basic to all these operations. The task of an FAS commodity analyst is:

> ...collection, analysis and dissemination of agricultural commodity situation and outlook information relating to our foreign market and competitor countries. . .The emphasis is on historical data series, analysis of the current commodity situation, and short-term forecasts, [12]

The Foreign Demand and Competition Division of ERS reports its assessment of the world and regional agricultural situation and outlook, The Administrator of ERS reports to the Director of Agricultural Economics. (See figure 4.)

In his testimony to OTA's Board, Mr. Howard Hjort set forth some general evaluation criteria to use in judging the strengths and weaknesses of information systems. He said:

> The factors that must be taken into account in developing judgments about the relative strengths and weaknesses of a world agricultural information system are objectivity, reliability, timeliness, adequacy in terms of coverage, efficiency, and effectiveness. The ideal is a system that provides users timely, unbiased interpretations of the current situation and outlook based upon estimates of known reliability for all commodities and countries through the use of the most cost effective procedures known to mankind.[13] (Emphasis supplied.)

The objectivity of the estimates transmitted by the attache depends to a large extent upon the accuracy of the estimates released by the host government and the attaches judgment.[14]

The **reliability** of the estimates that attaches transmit is a function of the methods used to collect and assess agricultural statistics. The reliability of estimates from national agricultural information systems varies significantly from one country to another. Estimates of questionable reliability must be subjected to consistency criteria and modified to make them internally consistent either by the attache or by the analytic staff in Washington. In general, the attache submit estimates based on their own and local staff's judgment after reviewing the estimates with others on the scene. The reliability of the estimates transmitted by the attache from countries that fail to provide reliable current estimates depends heavily upon their judgment--a function of experience, interest, analytic capability, and the importance they attach to the task of developing estimates. These attributes obviously vary significantly from one attache to another but in general are influenced by what they perceive to be their mission and by the length of time they are posted to a country, **Few attach& perceive the collection of agricultural statistics and the development of supply-demand estimates to be their primary mission;** instead, just as is the case for FAS, they believe their primary mission to be the expansion of foreign markets for U.S. farm commodities.[15] Mr. E. A. Jaenke, president of E. A. Jaenke & Associates, Inc., believes the United States has relied "far toc

NOTE: Footnotes appear at end of chapter.

Figure 3.—Organizational structure of USDA's Foreign Agricultural Service (FAS)

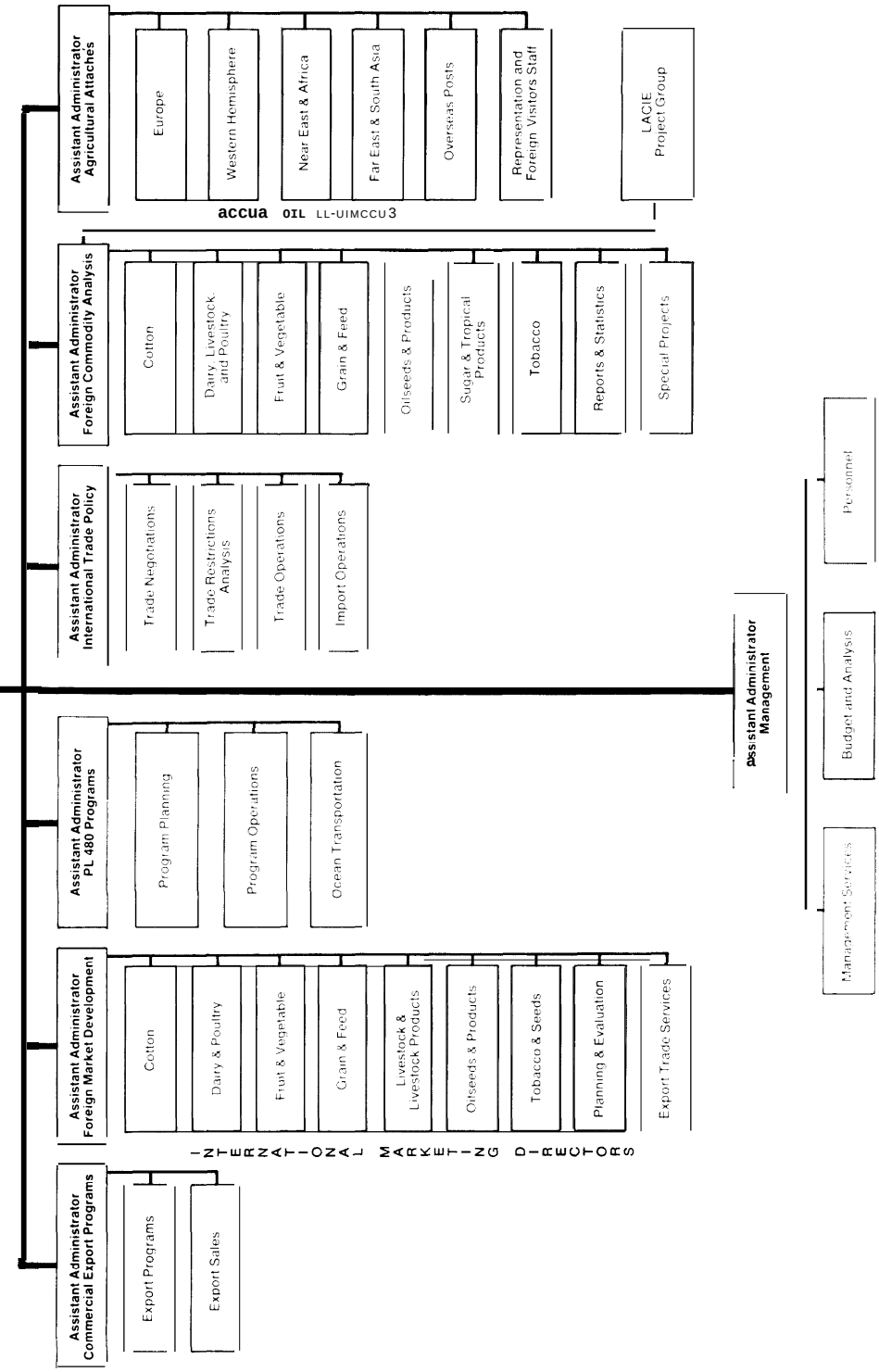
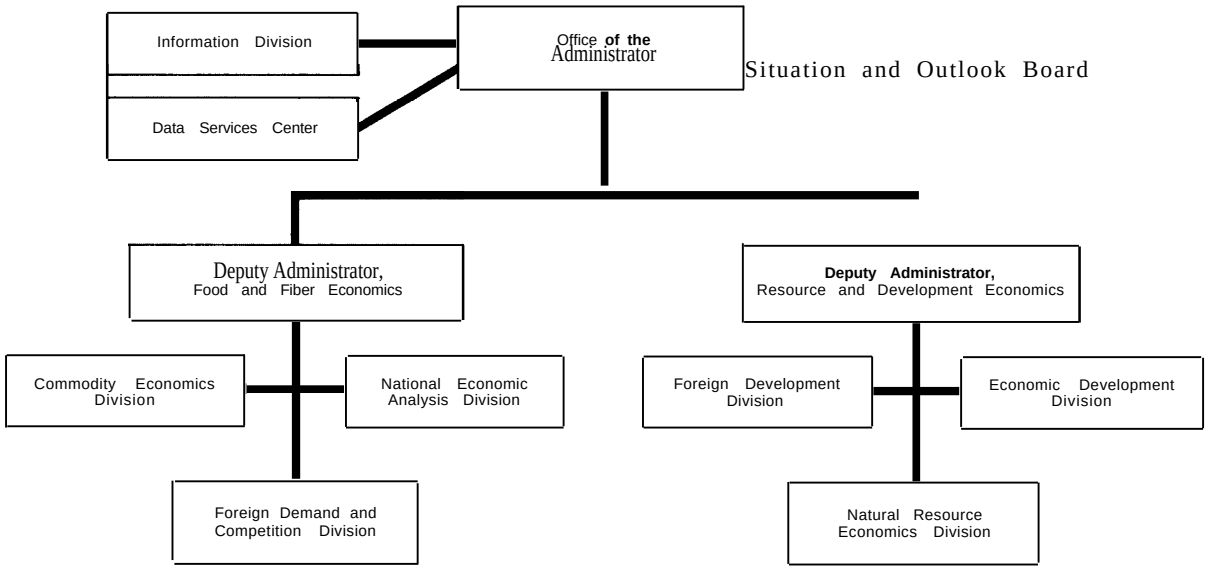


Figure 4.—Organizational structure of USDA's Economic Research Service (ERS)



long on the educated guesses of agricultural attaches. "[16]

The **timeliness** of agricultural intelligence depends upon directives from Washington, the initiative of the attache, and the ability of national systems to generate timely information.[17]

Collecting Foreign Agricultural Information

Reports from the agricultural attache are the heart of USDA's world agricultural information systems.[18] B Scheduled, coverage-specified reporting procedures are standardized by officials in Washington. The reports include assessments of the overall agricultural situation and the factors influencing production, consumption, and trade-such as prices, price and nonprice policies and programs, and input supply availabilities. Monthly highlight reports provide updates to previous reports—for example, quarterly on grains; semiannually on fats and oils; and annually on the overall food and agricultural situation.

In addition, special publications, press releases, and news conferences are used to report events of major significance more speedily.

Assessing and Disseminating Information

The Foreign Commodity Analysis Unit of FAS and the Foreign Demand and Competition Division of ERS share the responsibility for analyzing and disseminating information on world agriculture. Both rely mainly upon attache reports but obtain intelligence from numerous other sources, including the Central Intelligence Agency (CIA).[19] USDA personnel noted that they cooperated with CIA and were pleased with the interaction.[20]

In addition to USDA, there are many users of FAS information, with each user having somewhat different needs: first, the general public —i.e., farmers, private trade, researchers, and consumers; second, U.S. Government agencies—i.e., administration policy and program decisonmakers, Congress, and the analysts of the overall domestic and

NOTE: Footnotes appear at end of chapter

international economic situation; third, international organizations and foreign governments. [21]

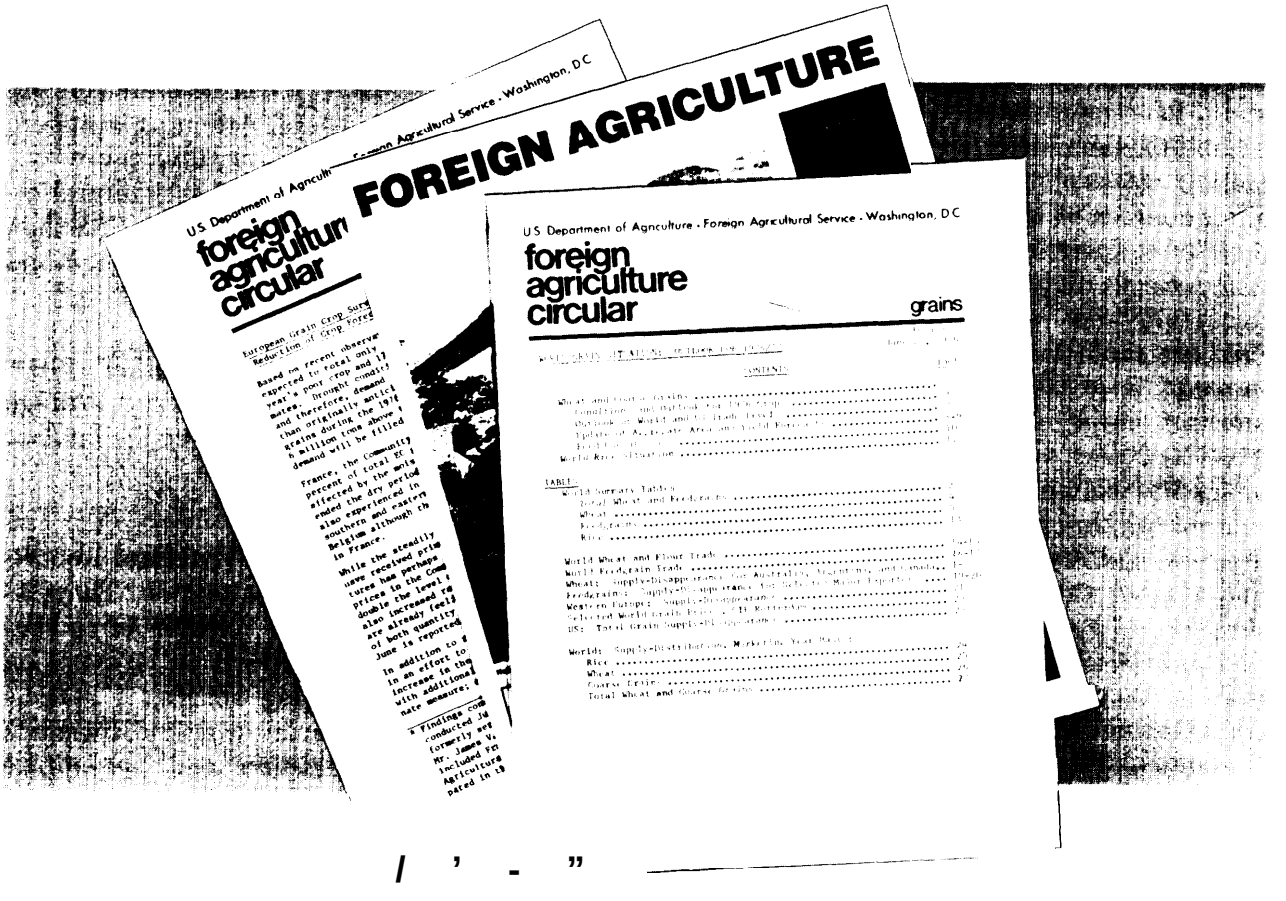
FAS reports and analyses are published in a number of forms[22] to meet the needs of the different users: 1) foreign agricultural circulars, 2) foreign agricultural reports, and 3) the weekly magazine Foreign Agriculture. (See figure 5.)

Realizing the strategic role that FAS and these publications play for users and decisionmakers, Mr. Hume indicated that the FAS information publications would be reviewed in 1976 in order to eliminate duplication and to provide more timeliness of information and improved analytical input.

ERS conducts a program of research and analysis that results in reports containing assessments of the current world and regional agricultural situation and near-term outlook, the longer range outlook for world agriculture, and the implications of changes in the international monetary situation, world agriculture and trade policies, and economic development and trade patterns. ERS also monitors and publishes foreign agricultural trade statistics of the United States. [23]

Dr. Quentin West, Administrator of ERS, said that ERS develops economic information for use by both public and private decisionmakers and provides it in a variety of ways to diverse audiences:

Figure 5.—Publications of the Foreign Agricultural Service



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> The audience is wide because our information covers many subject matter areas including farm inputs, farm production, and food processing and distribution as major components of the U.S. food and fiber systems; foreign agriculture production and trade; development and use of land and water resources; and the principal social and economic factors affecting life in rural America.[24]

Dr. West agreed with the conclusion reached by the OTA Food Advisory Committee report, which in his view underscores the difficulties in trying to get information to diverse groups:

> The economic models and supply-demand price equations which had performed satisfactorily in the more stable conditions of the 1%0's and 1960's had little value in light of the changes which occurred in the domestic and world markets when the size of the 1972 world grain crop became known.[25]

Since the basic source of data for analysis is the same for the analytic units of both FAS and ERS, improvements in the objectivity, reliability, timeliness, and adequacy of information released by them depend upon the other sources of intelligence they draw upon, their own analytic capability, and the consistency checks they employ prior to releasing information and reports. Estimates from the field are subjected to consistency checks, and in some cases estimates are developed by the analysts using analytic models that have generated reasonably reliable results in prior years. For example, estimates of grain production for the Union of Soviet Socialist Republics are developed by specialists in the Foreign Demand and Competition Division of ERS. Analysts in FAS rely more on simple consistency checks, experience, judgment, and trend analyses than on models or sophisticated techniques of analysis in checking or developing estimates. They do not conduct indepth analyses of issues or factors influencing supply and demand. [26]

The FAS analyst is a commodity specialist, while ERS is more research-oriented. ERS analysts are better trained in research methodology and have more experience in the use of sophisticated analytic techniques and models. They conduct the indepth analyses of issues and factors influencing supply and demand. ERS is the source of agricultural intelligence; FAS is the source of agricultural statistics and commodity information. In recent months, the flow of unanalyzed data from USDA's system has increased significantly, much more than the increase in reports containing carefully reasoned assessments of the current situation and outlook.[27] Users of such data, including media, must be aware of the quality of this material.

The world and regional agricultural situation and outlook reports of ERS are approved by the Outlook and Situation Board, The reports on the world situation and outlook by FAS for the various commodities are not approved by a similar board. Attempts to ensure objectivity and reliability are thus more evident with respect to the world agricultural information developed and released by ERS than is the case for the information developed and released by FAS.

In addition to FAS and ERS, other USDA agencies collect basic data, sort and arrange the data into useful tables, analyze the data, or disseminate it.[28]

The activities of USDA's Statistical Reporting Service (SRS) deserve attention. The SRS is the Department's major collector of current data on domestic agriculture. In cooperation with State crop-reporting boards, it collects and disseminates data on crop and livestock production and utilization and agriculture prices.

In addition, SRS takes an annual inventory of livestock on farms, surveys farmers on their intention to plant, and during the growing

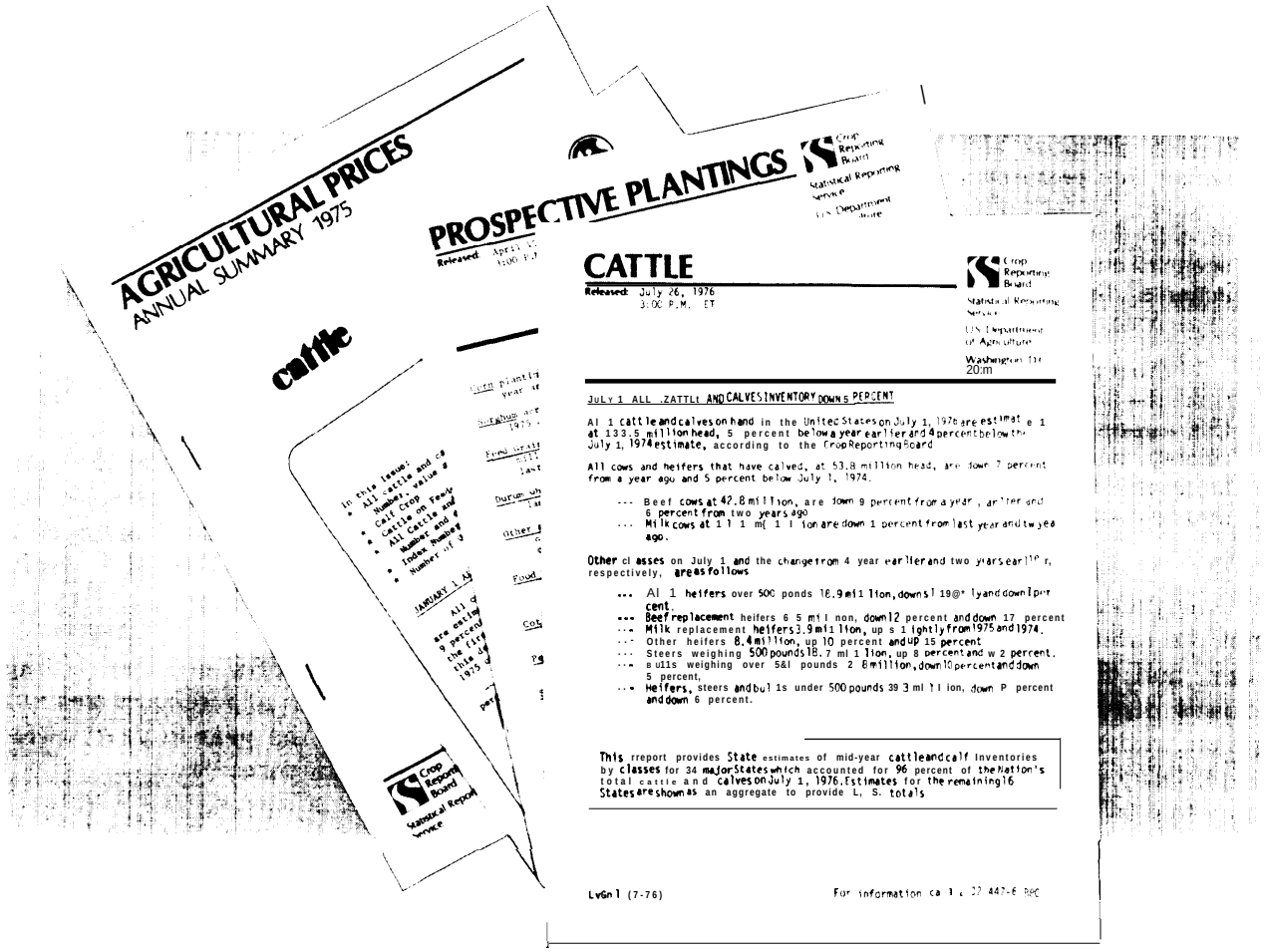
NOTE: Footnotes appear at end of chapter.

season provides monthly information on crop conditions, The SRS makes production projections, assuming normal growing conditions, up until crop harvest. (See figure 6.)

The Statistical Reporting Service is among the premier agencies in the world with respon - sibility for collecting, processing, and reporting agricultural statistics, It is thought to be the world's best with respect to timeliness and among the very best with respect to statistical reliability of the results.[29]

In sum, although numerous Federal departments, agencies, and other institutions are involved in food information systems, the key generator of the information is USDA, especially SRS, FAS, and ERS within the Department. The analysis of deficiencies and

Figure 6.—Publications of the Statistical Reporting Service (SRS)



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suggested improvements necessarily must focus on these key units.

Soviet Grain Purchases

U.S. grain sales to the Union of Soviet Socialist Republics in 1972 and 1973 are acknowledged to be the prime event that focused attention on the lack of information about the Soviet food system. The manner and consequences of these sales exacerbated the world food crises, Mr. Jaenke's testimony before the Technology Assessment Board members Senator Humphrey and Congressman George Brown lays the blame on poor intelligence and poor cooperation:

> The Soviets would not have been able to buy up such a substantial portion of the world's grain reserves in 1972-1973 at low prices had it not been for the failure of our intelligence systems to furnish adequate and timely information on Soviet crop prospects and buying intentions. In addition, the lack of coordination and exchange of information between various Government agencies and departments handicapped effective action by the appropriate U.S. officials,
>
> Without pointing the finger of blame at anyone since the Soviets went to great lengths to conceal this information, we wish to point up this excellent example of the importance of establishing more effective and better coordinated information systems.[30]

Analysts are careful to point out that it was not the sales per se but rather their manner, size, and timing, Buying secretly and big causes disruptions in the market, high food prices, and calls attention to the sales, Senator Humphrey concluded that the primary issue is how to regularize trade with the Soviets in the context of an orderly marketing system. al

The significance of Soviet purchases as a destabilizing factor is clear from table 1, which shows total Soviet imports of U.S. grain during the 1970's, in which the sharp fluctuations in Soviet grain purchases from the United States are evident,

Table l—Total Grain Shipments From the United States to Japan and the Union of Soviet Socialist Republics
(Thousands of metric tons)

Fiscal years	Japan	U.S.S.R.
1970, , , ..., ... , , , ,	8,841	0
1971 .., ... , ., . . . ,	8,786	0
1972	5,988	2,513
1973 .0..., ., ... , ..	11,779	12,880
1974. , ., ., , , , ... , , ,	13,304	6,775
1975	10,241	2,153
1976 (preliminary). , ,	11,320	13,380
TOTAL ... , ..	70,259	37,701

Source: Foreign Agricultural Service, USDA (June 30, 1976).

The average yearly sales were in reality moderate, less than 6 million metric tons. Other countries actually import more, For example, Senator Humphrey noted that "last year (1974), the Chinese actually bought more wheat and corn from the United States than did the Russians.[32] Another country that purchases large quantities is Japan, as shown in Table 1 which indicates that Japan has imported more in 5 out of 7 years since 1970 and that the difference in the other 2 years was insignificant. Japan's purchases have not been a destabilizing factor on the U.S. and world markets.

Dr. D. Gale Johnson, FAC member, noting the variation in Soviet grain purchases account for ". . .80 percent of the year-to-year variations in world grain imports. "[33]

Dr. Martin Abel, an OTA Food Advisory Committee member, consistently underscored the implications of this by suggesting that the key to improving the world food information system required quantum jumps in U.S. knowledge of the Soviet food supply-and-demand situation, In short, concern over ade-

NOTE: Footnotes appear at end of chapter.

quacy of data depends upon the impact the specific country has on the market. Dr. Dale Hathaway, director of the International Food Policy Research Institute, elaborated:

> . . it is completely unrealistic to talk of an adequate food information system that does not have timely and reasonably accurate information on agricultural conditions in the world's second and third largest grain-producing countries—the Union of Soviet Socialist Republics and the People's Republic of China. On the other hand, the absence of such data from a country whose population or food production is small is not of major significance to world markets and to other countries' well-being. Thus, "the adequacy of data for countries with small production and consumption levels is primarily their concern, and if they choose for one reason or another not to provide such information, they are more likely to be harmed as a result than is the rest of the world. On the other hand, timeliness of information provided is just as important for small countries as large ones when issues of food aid, disaster relief. and similar matters are involved; a starving person in a small country is just as badly off as one in a very large country if food aid is too late. Thus, timely information is essential for the effective operation of world food programs or a bilateral aid program.[34]

Dr. Hathaway concluded:

> Accuracy of information is always of importance to policy makers, but here again it relates to magnitude of the populations and production involved. A 10 percent error in production estimates for large countries such as India, the Union of Soviet Socialist Republics, China, or the USA creates substantially greater problems for world policy makers than a 50 percent error in the production estimate of a country that produces or consumes a few hundred thousand tons of grain annually. Unfortunately, statisticians are often more concerned about estimating errors than policy implications of such errors and thus may be overly concerned with accuracy in some cases.[35]

The Food Advisory Committee report found that the consequences of the increases in U.S. farm production and food prices caused by grain sales to the Union of Soviet Socialist Republics ", , was" not publicly predicted by authoritative sources inside or outside Government."[36]

Mr. Melvin Sjerven, senior markets editor of Milling & Baking News, agreed, He was "absolutely convinced that no one in the Department of Agriculture, no one in the Government, had any idea how much grain the Soviets were going to buy in 1972. "[37]

Senator Humphrey and Assistant Secretary Bell agreed that the real problem" is the Soviet buying habit:

> They have bought large amounts one year, small amounts the following year, large amounts the next year, small amounts the next year. small amounts the following year. This has tended to add" a degree of instability to the market.

> .. and the purpose of the long-term agreement. , .is to try to smooth out that buying pattern and bring more stability to the market.s~

Assistant Secretary Bell said we need the Soviet market:

> .,. if we are going to continue to run American agriculture at full capacity, We still have more resources available to us under our system of agriculture than we can adequately use to feed our own people and generally Western allies and the developing countries,

> So I think the main benefit we get from selling grain to the Soviet Union is that we run American agriculture at full capacity, In the longer term, that means lower food prices for everyone.[39]

Assistant Secretary Bell explored the significant steps that the United States had taken to better understand Soviet food supply and demand conditions. These were:

- June 1973, "Cooperation in Agriculture Agreement Between the United States and the Union of Soviet Socialist Republics;" [40]

NOTE: Footnotes appear at end of chapter.

. Improved interagency cooperation and increased use of collaborative data, such as weather data; and

. Internal USDA changes.

In reviewing the Soviet record under the Agriculture Information Exchange Agreement, Assistant Secretary Bell gave the Soviets good marks. He said: "On the whole, the Soviets have followed the reporting schedule rather closely for the initial 10 categories of data. "[41]

Information received under the agreement contributes to quicker access to data on actual values (but not forward estimates) of commodity production or related information for the current or most recent year. It also provides some data not previously published on a systematic basis by the Union of Soviet Socialist Republics—for example, numbers of livestock slaughtered, oil and meal production, and fertilizer use by major crops, " . . information of a very current nature that will enable a better assessment of foreign trade prospects in grain and feeds."[42]

On the other hand, some of the deficiencies that continue to impede a more complete U.S. understanding of the supply-demand conditions in the Union of Soviet Socialist Republics are related to:

• delays in transmission;

. lack of forecasting data; and

. lack of historical data.

Bell said:

> Allowance must be made, of course, for delays in transmittal. The first-of-the-month livestock count, for example, which the Soviets have agreed to provide in mid-month, typically arrives in the USDA analysts' office during the first week of the following month. The usefulness of new data series has been limited in several instances because the Soviets frequently have not provided historical data in the series.
>
> In addition, there has been some feeling that the Soviet data are less detailed than was expected. . (The most serious problem seems to be that) the Soviets have not yet demonstrated willingness to implement the forward estimates provision of the agreement.qs
>
> . . . when we ask for forward estimates, they say, well, this is what the plan says, , .And not until the year has been completed will they admit that the plan was not fulfilled. And it gets involved in how the Soviet system works.[44]

He indicated that the United States has tried to overcome this gap and improve the availability of Soviet data by sending teams to the Union of Soviet Socialist Republics in an attempt to better understand their economy and to meet and interact with the Soviet decisionmakers, economists, and agriculturalists, In sum, the Assistant Secretary indicated that the U.S./U.S.S.R, agreement is enabling the United States to get information on what is going on in the Soviet farm sector much sooner and in a much more useful form than prior to 1972.

It is recognized that:

> Data acquired under the agreement probably will continue to make only a marginal contribution to current situation and outlook work on grains and feeds until a program is worked out to implement the provision of forward estimates.[45]

In addressing the question of whether the Union of Soviet Socialist Republics actually has more data that could be made available, perhaps on a more timely basis, Assistant Secretary Bell concluded:

> I am confident, though, that there are regular data which are flowing toward Moscow on the crop conditions and the crop situation during the harvest. How this is put together and who it goes to we have been unable to really find out, though we did have a team over there that did look at how they gather statistics and so forth,

NOTE: Footnotes appear at end of chapter.

> Hopefully, some day we will be able to tap into that system and get something. But as of now we have not.[46]

Dr. Abel, in summing up for the Food Advisory Committee, said:

> The adequacy of data on Soviet food and agriculture continues to be a problem. . .The present long-term grains agreement between the United States and the Soviet Union is an alternative way of obtaining some information from the Soviets about trade prospects. However, this agreement is only a partial answer to minimizing the erratic price movements in grains caused by large changes in Soviet purchases.[47]

He also suggested that:

> It may be time for the agricultural committees to take another hard look at just how far we have come in getting needed information from the Soviet Union, why we are not getting more information, and what can be done about it.
>
> ., .it might be worth considering ways by which the United States might help improve the timing and reliability of Soviet data. If. . such collaboration is not possible or desirable, then continued efforts will have to be made to find ways to keep the Soviet Union from unduly disrupting world grain markets. [48]

Interagency Cooperation: Weather Data

Interagency cooperation in the U.S. Government also makes an important contribution to USDA's analysis of the Soviet situation. This is exemplified in the gathering and application of weather data both to confirm Soviet reports and to assist in estimates of current Soviet crop prospects. The significance of this improvement was underscored by Assistant Secretary Bell, noting that the Department of Agriculture's principal difficulty has been in the l-year forecast, where the weather forecast is much more difficult to deal with.[49]

He pointed out that:

> The weather data are by far the most important source of information used in making Soviet grain forecasts as the crop progresses. so

Weather data permit the USDA researchers to estimate regional weather indexes of grain crops and to estimate national grain yields.

The principal source of weather data used by Soviet analysts in the Department of Agriculture is the Air Force Environmental Technical Applications Center (ETAC). ETAC regularly brings this weather data and their timely monitoring of radio stations together in a computerized system for USDA.

The ETAC weather data are supplemented by other sources—for example, more current but less processed weather information is available through facilities of the National Oceanic and Atmospheric Administration (NOAA). This information is checked to supplement ETAC data at critical stages of Soviet crop development.

Assistant Secretary Bell added that the Department of Agriculture is able to validate to some extent ETAC's information, since:

> The Soviets also publish 10-day weather and crop reports in their daily agricultural newspapers. The information. . . generally is available in Washington within not more than 1 week at the end of the reporting period. (This information is) of some use in evaluating the stage of crop development and the probable impact of varying weather conditions on crops. [51]

Dr. Robert White, NOAA Director, substantiated and underscored the fact that:

> ,..emerging technology for observing and predicting weather conditions can make our agricultural information systems more effective in increasing agricultural productivity and assist in policy decision making. [52]

Dr. White discussed three ways in which weather information can be of increased value:

NOTE: Footnotes appear at end of chapter.

(1) It can help the farmer directly, enabling him to carry out his daily task with greater efficiency. Weather information a day or two in advance can affect the way in which he protects, sprays, harvests, or sows.

(2) It is useful to Government policymakers as a part of an agricultural warning and assessment system.

Such weather information from our country and others plus an understanding of the relationship between the weather and crops can enable us to assess the impact of the recent past and present weather conditions on crop production, thus generating a basis on which both operating and policy decisions can be taken.[53]

(3) It can help Government and private grain trade to assess the problems of climate and anticipate its further changes.

An ability to predict changes in average weather conditions over a period of months, seasons, or years could be valuable in alerting us to possible adverse or beneficial growing conditions both in this country and around the world. Such information could be useful in planning decisions on agricultural production, storage of agricultural reserves, food export policies, and preparation of disaster assistance.[54]

Organizational Changes

Assistant Secretary Bell pointed to organizational changes made within USDA since 1973 to improve its food information resources. Organizational changes were designed to improve and strengthen the Department's analytical capacity of the Soviet food sector. An interagency task force was established in 1973.

This task force on Soviet agriculture has provided a means of coordinating information on the Soviet Union and making this information public on a prompt and systematic basis. It includes representatives of four USDA agencies—the Foreign Agricultural Service, the Economic Research Service, The Agricultural Marketing Service, and the Agricultural Stabilization and Conservation Service. During the principal production and marketing seasons, it meets every 2 weeks under the chairmanship of the Director of the FAS Grain and Feed Division.

Discussions within the Task Force have brought together information which has provided the basis for policy decisions within the Government this year, relative to Soviet trade. It was this group that first alerted people within the Government to the drought developing in the Soviet spring grain areas this year—and then made this information public in a series of reports and releases. [55]

Other organization changes were noted as the OTA Board probed a suggestion made in the FAC report that Congress hold hearings to "determine what improvements in the Foreign Agricultural Service and Economic Research Service have been made since 1972–73 and what further improvements are feasible.[56]

Mr. Hume detailed other steps that have been taken by USDA since 1973 or those actions that were to be taken:

- Thorough review of the USDA agricultural attache system. Noting that the agricultural attache system is the heart of USDA's data gathering, Mr. Hume indicated that in 1976 USDA would complete ". . .a detailed review of the attache reporting system with the objective of consolidating and refining it to tie information more closely to the needs of information users and to our analytical system. "[57]

- Improving the analytical capability of individuals within FAS. Mr. Hume said that to accomplish this 1) commodity analysis specialists are receiving additional training; 2) increased qualifications are being demanded, especially in economic techniques and the use of computers; and 3) a better rotation system is being developed,

NOTE: Footnotes appear at end of chapter.

in order for junior personnel to develop a thorough understanding of the USDA Washington operation before accepting a field assignment.

To emphasize the demand side of the supply-demand equation and to improve its automatic data-processing (ADP) facilities FAS has established an ADP Steering Committee to coordinate data processing and computer support within the Department of Agriculture. [58] Likewise, ERS has made changes since 1973 to assure more timely, accurate, and objective information. Noting that the basic contribution of ERS to the food and agriculture information system is economic analysis, Dr. .West said:

> . . .we have placed our first priority on improving our analytical capabilities, especially in our major economic situation and outlook programs. [59]

He also discussed improvements in the type and timeliness of information provided and the efforts of ERS to improve the flow of data as raw material or input to their analytical process. [60]

The three major steps taken to improve ERS's analytical capability has been to:

1. Reorganize its resources to focus on subject matter areas and to bring the research program into more direct support of the situation and outlook work.
2. Reprogram $600,000 and relocate 19 staff positions to the situation and outlook work and longer-term programs.
3. Request about $500,000 in additional resources to provide an increased number of highly capable, quantitatively oriented economists. These additional resources should strengthen the commodity situation and outlook staffs and establish forecast support units, which have become the focal point for development of commodity, cross-commodity, and foreign country models that are becoming increasingly operational as a part of USDA's forecasting work.

Another important change reported during the last 3 years is improved forecast procedures. USDA has developed a regular program of producing new forecasts each quarter on what they consider to be the most likely changes for the 3 to 4 quarters ahead, An informal matrix in figure 7 illustrates the organizational structure of the ERS long-range projections program.

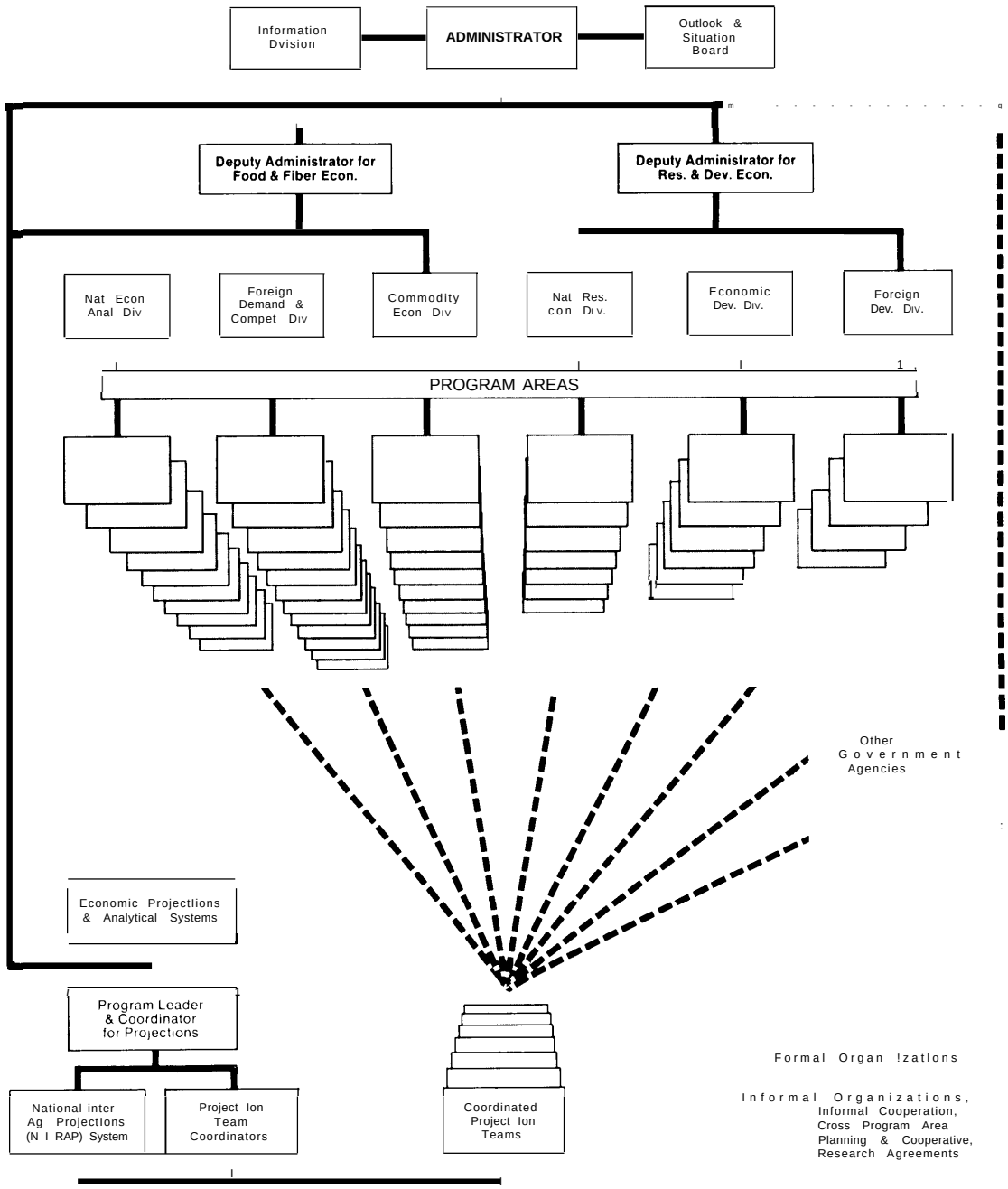
> Then we supplement this forecast with contingency analysis using alternative assumptions on such key variables as weather and levels of exports. The results of these analyses and the underlying assumptions are then discussed in group meetings with other key staffs from USDA, Council of Economic Advisors, and the Federal Reserve Board, Treasury Department, and the Library of Congress. This interaction helps test the soundness of our assumptions and analysis. [62]

Major improvements have also been attempted in ERS's publications program:

> Most conspicuous has been our new monthly Agricultural Outlook situation report. This serves as an outlet for brief reporting on our continuing appraisal of the situation for commodities, farm income, farm inputs, foreign production and trade, transportation, and farm-retail price spreads, Our target is to furnish through this new publication full updates of our forecasts each month to provide our best estimates of the agricultural situation. . ,Other changes in publications to provide more timely information include issuing the report, "Agricultural Supply and Demand Estimates, " containing updates about monthly important basic commodities going from once a year to three times a year in publishing World Agricultural Situation and from annual to quarterly assessment and publication of Outlook for U.S. Agricultural *Exports.*[63] (Figure 8,)

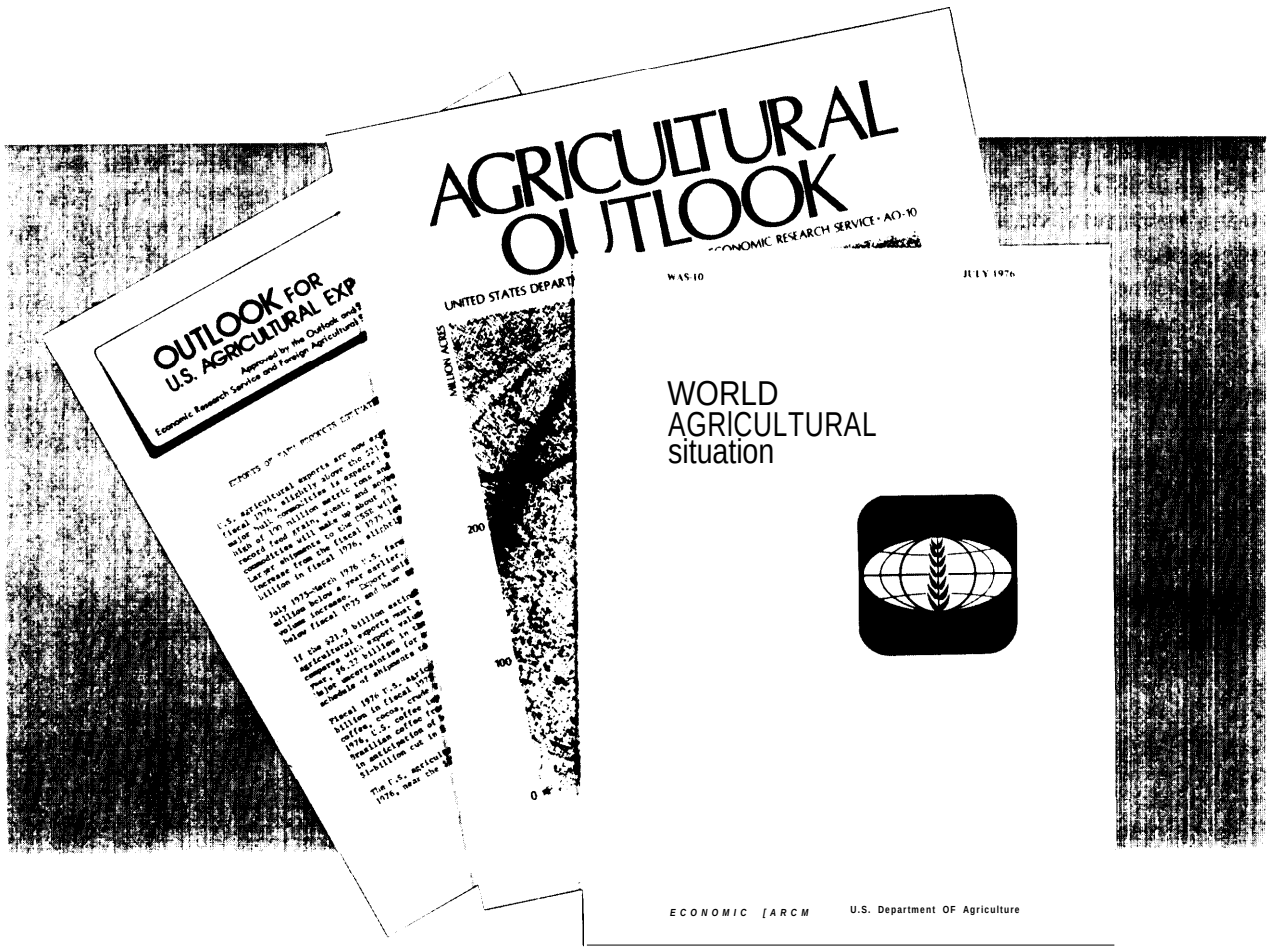
NOTE: Footnotes appear at end of chapter.

Figure 7.—informal research matrix of the organizational structure of the ERS Economic Projections Program



Source: *Agriculture in the Third Century* May 1976 Number 1 Compiled by Or Leroy Quance USDA ERS

Figure 8.—Publications of USDA's Economic Research Service



Concern over the obsolescence of agricultural data systems was evidenced by Dr. West:

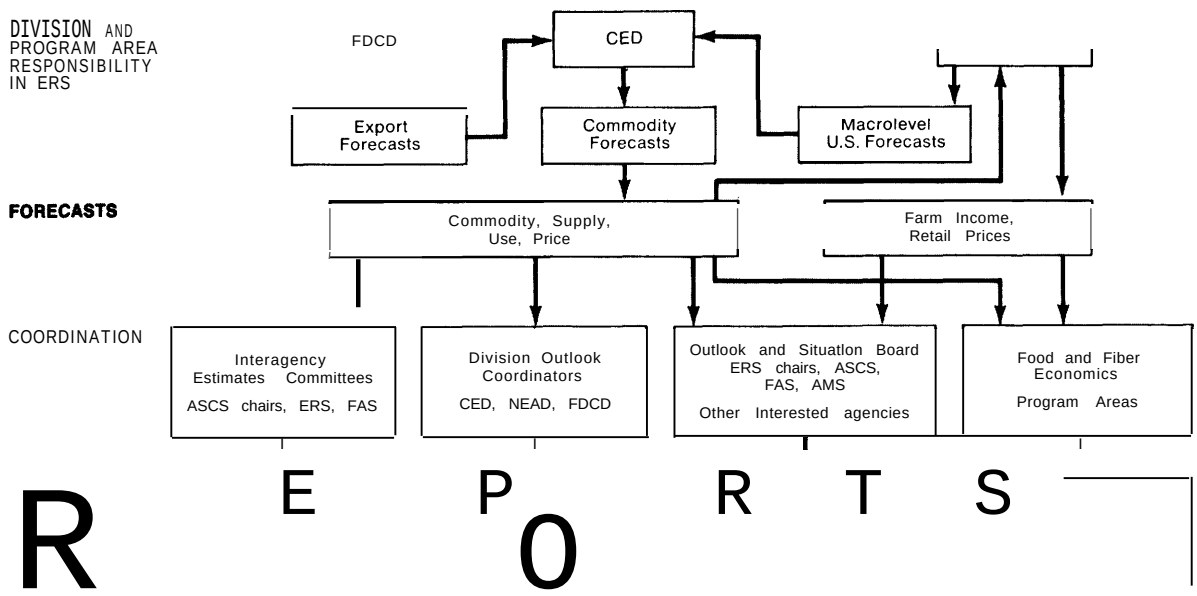
> We feel that ERS should take the lead in reviewing and changing data series that no longer provide the most meaningful descriptions of food and agriculture. . . (ERS) has the special task forces to assess the farm income and price spread, market basket and market bill statistics and make recommendations for improvement.[64]

Dr. West discussed the steps that ERS was taking to develop a flow of data that would fill its major gaps in data available for analysis. First priority is to combine some programs of ERS and SRS, add some resources, and implement an annual economic survey of the farming sector. This would provide data for improving the supply-response analysis, farm income estimates, capital accounts, consumption of major inputs, and some environmental analysis. Second priority is to start collecting data that would allow significant improvements in ERS's analysis of the structure, cost and performance of the farm input, food-processing, and food distribution industries.

ERS still must improve its data on foreign agriculture. Dr. West indicated that ERS worked closely with FAS to establish a more complete data base on world production of grains, that they have worked with FAS and FAO to improve information on fertilizers, and that they are continuing discussions with FAO about more access and use of an extensive supply-utilization information system which they have been developing over the past 4 years. Finally, he said, "An increasingly important part of our effort for improving data flow is to more fully apply current computer technology and capabilities in managing and analyzing the large volume of data we work with.[65] Figure 9 illustrates one such information flow, the ERS shortrun forecasting process.

NOTE: Footnotes appear at end of chapter.

Figure 9.—Information flow in uSDA's shortrun forecasting process



ASCS-Agricultural Stabilization and Conservation Service
FAS—Foreign Agricultural Service
AMS-Agricultural Marketing Service
ERS-Economic Research Service
NEAD-National Economic Analysis Division
CED—Commodity Economics Division
FDCD-Foreign Demand and Competition Division

He also looked toward future improvements:

> Our first priority is to bring to fruition the plans we have laid out for improving the flow of data. This includes both the plans for getting more of the data we need and for more effectively managing and analyzing the data we already use. . .Our most immediate needs are for a continuous survey of food purchases by consumers, a flow of data on the economic aspects of land and water resource use, and data on structure, cost and practices of the farm input, food processing and distribution industries. . .To improve the flow of foreign data, we plan to critique the grains data base improvement work we have been doing with FAS.[66]

In sum, these highlights presented by USDA officials Bell, Hume, and West attempt to show the specific actions taken since 1972 to improve the timeliness and accuracy of the key units in USDA responsible for food information resources.

NON-USDA COMMENTS

Naturally, USDA statements of pride in their resources and the steps taken to improve their information resources since 1973 might be viewed as self-congratulation and puffery. To test this, OTA asked principal user groups, grain and processing industries, and farm organizations to comment. To a person, it was agreed that:

- The USDA system is excellent, the best in the world;
- USDA has taken numerous corrective steps since 1973 which seem appropriate, and USDA seems to be receptive to further suggested changes; and
- Additional perfecting improvements could be made.

A good example of this is found in the comments of Mr. Hosea Harkness, director of planning of Cook Industries. He made it clear that an international grain trading company lives day by day with the agricultural statistical information which is available and taps every source it can locate. In addition, it continuously attempts to verify by its own intelligence the most recent market developments.

Commenting on the Economic Research Service, Mr. Harkness noted that since 1972 the Situation and Outlook Board has improved its operation. He suggested, however, that each Supply-Demand Report could be broadened to give further explanation of the parts of the supply-demand balance tables.

Regarding the Foreign Agricultural Service, Mr. Harkness feels that:

> . . .it does the best job in the world in putting world statistics together on a comparable basis. They have speeded up their release of data considerably since 1972.[67]

He emphasized that the Outlook and Situation Board reports of the ERS were the only economic type of information which a large segment of private industry has and noted that this was especially critical for any firms or organization which cannot afford a staff of economists.

> .we must recognize that there are many people, and companies and organizations, which are smaller than we (Cook Industries) are who cannot afford to have this type of personnel on their payroll, and ERS is very essential to them.[68]

Comments made by Mr. Melvin Sjerven of Milling & Baking News, one of the most read and respected weekly trade magazines for managers of grain milling and baking, underscored Mr. Harkness' conclusions and recommendations. Mr. Sjerven said: ". . owe have been very much impressed with improvements (since 1972) . . and that commendation is accompanied by strong urging for further improvements. "[69]

NOTE: Footnotes appear at end of chapter.

Mr. Sjerven said that there is almost a surplus of information in 1975, which is an improvement from the scarcity of information in 1972. With a few notable exceptions, he found the current informational reports of the Department of Agriculture to be timely and accurate. These exceptions were:

1. The conflict between wheat export inspections data as provided by the Agricultural Marketing "Service and accumulated exports as reported by the Foreign Agricultural Service in its weekly issuance of the U.S. export sales.

2. A need to coordinate information derived by the various agencies before releases are made.[70]

Mr. Sjerven, as did every OTA witness, held in high regard the integrity of the publications of USDA's Statistical Reporting Service. He was favorably impressed by the Situation and Outlook Reports of ERS and recommended the expanded use of such advanced technologies as remote sensing and analysis of weather data. He also suggested that advances in information technology be pursued and utilized and that:

> ...Government agency responsibilities should shift from providing a proliferation of projections and estimates to a coordination of information with special emphasis on consumer needs. [71]

A suggestion for organizational changes was also noted by Mr. Sjerven.

> . .in the process, some shifting of responsibilities among the agencies would undoubtedly be in order. Certainly, conflicting data should be reconciled as much as possible.[72]

Mr. David Keefe, general partner and head of the Lamson Commodity Group, a 10l-year-old New York Stock Exchange member, firmly agreed with the accolades and commented that:

> The USDA has done an admirable job of adapting to the dramatic changes that have occurred in the world food/feed grain situation in the last 3 to 6 years.[73]

He felt that it had "aggressively initiated programs to improve on the accuracy and timeliness of reports on the world food situation. . ." and that ", , , USDA is doing a tremendous job in surveying and reporting on this rapidly changing and complex world agricultural situation.[75]

Testimony by representatives of farm organizations was complimentary on the issue of the Departments' food information system. Mr. Reuben Johnson, legislative representative of the National Farmers Union, said:

> I may shock a few people for making this statement—but we in the Farmers Union generally find the Department of Agriculture's statistical information and related resources to be highly useful to us.[76]

Mr. Charles Frazier, director of the Washington staff of the National Farmers Organization, echoed the comments made by Mr. Johnson in terms of the good job that the Department of Agriculture does in providing information.[77]

Mr. Eugene Hamilton, chief economist with the American Farm Bureau Federation, agreed with his colleagues:

> On the whole, I think the Department of Agriculture and its statistical agencies do an excellent job. . .And while I'm certainly in favor of improvements, I think the Department's batting average is very good. ..78

Mr. Johnson suggested some specific improvements that USDA might make:

. Devote more of its energy to reporting on the relationships between price that the farmers receive and the price (costs) that they pay.

. Do a better job reporting on the parity ratio.

NOTE: Footnotes appear at end of chapter.

- Provide guidance to the farm community in the area of supply and demand—i. e., regarding crop projected supplies.
- Provide better information on marketing margins[79] because of their considerable effect on farmers and consumers.
- Attempt to resolve differences in numbers when they occur, just as differences are hammered out by the Crop Reporting Board before the Board makes its forecast.[80]

Differences developed over Mr. Frazier's suggestion that USDA find a method to regularize the distribution of informal, unevaluated marketing information.[81] This was not acceptable to Mr. Hamilton who was concerned that the Department could not escape criticism if it put out information hurriedly and made mistakes.[82]

Mr. Frazier recognized that this would be highly speculative information and that individuals would have to be willing to accept it without any guarantees of certitude, with indications for example, "at the top and bottom of every page that this is a projection—this is an estimate. . ."[83]

SUMMARY

The U.S. Department of Agriculture (USDA) maintains one of the two key food information systems. USDA operates both a national and a world system and is regarded as the best source of information. Other institutions-such as international organizations, private firms, and other countries—acknowledge their dependence on USDA data as their benchmark.

Substantial changes have been made since 1973 in FAS and ERS to improve USDA's system. These changes include:

- modifying the agricultural attache' system;
- Inadequate analysis;[87]
- USDA's fragmented organization structure;[88]
- attempting to get better information on the Soviet food situation;
- releasing more timely crop forecasts;
- effecting changes in organizational structure;
- placing more emphasis on demand, including collecting new data areas; and
- using modeling and remote-sensing technologies.

Participants, while noting this progress, pointed to a number of deficiencies that persist and additional changes that they felt should be made. Deficiencies and suggested improvements are discussed in the following text.

DEFICIENCIES

Interspersed with the favorable review of USDA's food and agriculture information system were several comments on deficiencies that, if corrected, would improve USDA's effectiveness and efficiency.[84] These deficiencies can be grouped into four categories:

. Poor national systems; as

- Collection of inadequate and/or obsolete data;[86]
- improving staff analytical competence;
- upgrading publications and eliminating duplication;

Deficiencies Due to Poor National System

The supply-demand estimates produced by national agricultural information systems

NOTE: Footnotes appear at end of chapter.

vary greatly in reliability, timeliness, and adequacy. There are a number of countries where . estimates are seldom released in a timely manner.[89]

This problem is especially acute in developing countries and has impacts on both the USDA and FAO information systems. The FAO report, in discussing this deficiency in developing countries, said:

> In perhaps 100 or more of the developing countries, the national information systems are so poorly staffed that the data supplied by FAO is lacking in reliability. There is great variation in the agricultural information systems found in these less developed countries. Many countries lack even a recent census of agriculture, Others have agricultural census data collected at regular intervals supplemented by sample surveys and by reports of knowledgeable people at regular periods throughout the year.[90]

The supply-demand estimates produced by some national agricultural information systems lack objectivity. To prevent this problem from impairing the objectivity of USDA's system, USDA analysts must develop a deeper capacity to generate unbiased estimates for the country of concern; and those managing the USDA world system must be prepared to defend the revised estimates.

The scope of the intelligence system operated by the attaches is broad, but its **adequacy** is impaired by the lack of uniformity of coverage in terms of both content and geography.

Attache discussions of the factors that influence production and supply tend to be more complete and frequent than their discussions of the factors influencing the demand for agricultural products, The attache or their staffs base their discussions of demand upon extremely simple analytic techniques or pure judgment instead of on formal models. that generate results of known reliability.

The adequacy of the intelligence system operated by the attache also remains below its potential due to inadequate coverage of several important agricultural countries. The most notable gap in this respect is the lack of an attache in the People's Republic of China. Our intelligence gathering in many centrally planned economies is weak to nonexistent.

Efforts by the USDA to improve its agricultural attache system is a recognition that improvement in data systems of the developing countries is a long-term expectation at best. Thus, the USDA must improve its capacity to make judgments in light of poor and nonexistent information. Seth and Cochrane rate this deficiency as so critical that the United States should take appropriate steps to improve national data:

> In order to make the best possible estimates. . the Department of Agriculture needs the best possible political and economic intelligence about world supply and demand. The U.S. Government ought to take the leadership in helping to improve crop and livestock reporting services for other countries, the United Nations Food and Agriculture Organization, and the new World Food Council.[91]

Deficiencies Due to Collecting Inadequate and/or Obsolete Data

The reliability of the supply-demand estimates forwarded by attaches varies significantly. In addition to the problems with national systems, reliability is reduced due to the low priority given the development of estimates by some attache, the lack of knowledge about the country due to frequent reposting, and inadequate training or interest in the use of analytic techniques.

The issue of obsolete data was discussed in the OTA Food Advisory Committee report, which Dr. Don Paarlberg, Director of Agricultural Economics, U.S. Department of Agriculture, found to be quite comprehensive.

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> (I feel) it... serves the very useful purpose to highlight concerns about inadequate information. . .The problem of obsolete data series. , ,is a pertinent one, primarily caused by changing structure and changing flow of economic activity in our food and agriculture system.[92]

Mr. Eugene Hamilton noted that some agricultural data series are obsolete and that this was well illustrated by the Food Advisory Committee's discussion on broiler prices.[93]

The fact that USDA had some inadequacies in the data they collected was discussed by Dr. Quentin West in terms of work that needed to be done:

> Our staff has also done a lot of work in planning how to meet some of our other major data problems. One of these is a continuous survey of consumer food purchases so we can improve our forecasting and analytical capability with respect to food prices through better measures of price and income elasticities and demand shifters. A second longer range plan is to fill in the many economic and social data needs on the use, the changes in use, and potential capacity of our land and water resources.[94]

" He indicated that USDA is in the process of trying to identify major data gaps and that it plans to provide the resources to fill these voids, It is Dr. Paarlberg's view that such improvements can best be made by:

> the managers of the key agencies, those who know the data problems and the difficulties of change most thoroughly, and who must carry through on commitments for change. They are in the best position to modernize, coordinate, and standardize the food and fiber data series.[95]

Referring back to the OTA Food Advisory Committee discussion on "Technical and Institutional Obsolescence of National Food and Agriculture Information Systems,"[96] He added that the point on obsolete data series:

> ...is well taken. Agriculture changes rapidly and it is important to keep our statistical series updated, and some of them are frankly a bit out of date.
>
> We have had the review committees come in and work with us on this from the American Agricultural Economic Association, and the American Statistical Association. We have reviewed several of our specific series, particularly the farm income series. We are updating the definition of a farm which I think will bring us more current with regard to the present nature of the farm, [97]

In a statement on April 28, 1976, before the Subcommittee on Family Farms and Rural Development of the House Agriculture Committee, Dr. Paarlberg said, the definition of a farm that has been in use since the late 195o's is any place under 10 acres with annual sales of $250 or more of agricultural goods, and any place of 10 or more acres selling $50 or more of goods. The new definition would be any establishment from which $1,000 or more of agricultural products is sold or would normally be sold during a year.

Deficiencies Due to Inadequate Analysis

The analysts in FAS rely almost exclusively on experience, judgment, and trend analyses in making initial forecasts of supply-demand balances for the commodities. However, trend analyses in recent years have failed to provide reliable results. More detailed analyses of the factors that determine production and consumption are required to improve the reliability of USDA's world estimates,

There is clear imbalance in USDA's system; more data for analysis are being provided from the field and other sources than are adequately analyzed, This imbalance stems from insufficiently precise data and from an inadequate analytic capability, It is also a function of the organizational structure USDA uses to operated the world system. There is need for more precise reporting from the field on the input situations and outlook and the factors influencing consumption requirements.[98]

Mr. Hume commented on USDA's analytical deficiencies. He noted that:

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> Most of our analytical work is currently based on simple trend models, experience and commodity knowledge, and common sense. We think this has given us a pretty good track record, and with the re-emphasis on reporting, etc., we have shown improvement over the past 2 years. This is not to say, however, that we have achieved perfection. We have been criticized at times for shortcomings in providing timely data and for a lack of sophisticated, econometric input to our analysis. We think that with (additional) professionals we will be able to move forward in this area but we feel we should add a note of caution in that there are severe limitations in econometric modeling and in the data requirements for these models. Progress and improvement from this source will be slow.
>
> We are moving forward in other areas as well. To date, most of our work has been on the production and trade side. We are now moving to emphasize the demand side. We have added a specialist in macro-economics to provide our commodity specialists with forecasts and analysis of the general demand situation in major countries.[99]

In essence, Dr. West recognized the need to make improvements in USDA-ERS analytical capability and outlined the steps and actions being taken in personnel, organization, forecast procedures, and publications.[100]

Mr. Harkness noted that the techniques which Cook Industries and other grain companies utilize in their analytical process are mainly geared for timeliness:

> .,,the attitude that we must take on most Government statistics is that this is the base, but there is necessity for timeliness here. . .And one point I would like to make along this line is the fact that I repeatedly hear out of FAS, "Well, we haven't heard from the cable we sent two weeks ago." If we want to know something today we pick up the phone and call. We don't wait to send a cable,. . .And I don't know if this can work within the Government, that you pick up the phone and call, but by the same token this is one solution we have to the timeliness problem. . .We're continuously analyzing all the known components of what makes a crop report.[101]

Harkness noted that the grain industry places a high premium on information and that at Cook Industries he has an unlimited budget;

> . . .in other words, if there's a job to be done I'm there. So I don't even know what my budget is as a part of the total. . .It's just a matter of timeliness, because these things can't wait.[102]

Deficiencies Due to Organizational Structure

The organizational structure used by USDA to' operate its world agricultural information system seems to impede efficiency and effectiveness. Mr. Hjort's comments indicate the difficulty in using analysts efficiently and effectively when responsibility for the output of a system is divided between two completely separate agencies.[103]

Permitting the responsibility for the world agricultural information system to be shared by two different agencies—with the key agency, FAS, having program and policy responsibilities-seems to make the system weaker and open to the possible charge of lack of objectivity.

Cochrane and Seth's prepared remarks and discussion makes this point, while adding a suggested way to resolve this conflict:

> There is a confusion of functions in this setup and a potential conflict of interest that may contaminate the quality of the information and analysis.
>
> The Foreign Agricultural Service (FAS) has a . primary responsibility to expand foreign markets for U.S. farm products. This makes suspect the assessments of world commodity situations and outlook prepared by the Foreign Commodity Analysis Unit of FAS. One way to overcome this apparent conflict of interest would be to transfer this analysis unit to the Economic Research Service (ERS). Commodity specialists in ERS already perform much of the same kind of analysis in foreign commodity situations. It is logical to combine the two staffs and to place them under ERS, which has no "action" responsibility. Its duty is to provide economic in-

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Intelligence for users of its reports and for government policymakers.

FAS also has a responsibility to collect facts and collate information about world food and agriculture conditions. To achieve the maximum objectivity, it would be desirable to separate this fact-gathering function from the sales promotion agency and to assign it to the Statistical Reporting Service (SRS), which has the sole function of preparing factual reports on agricultural data. However, the responsibility for collecting foreign agricultural data necessarily must remain with the agricultural attach& under FAS until such time as specialists in crop and livestock reporting can replace them.[104]

The mission of FAS is to expand foreign markets for U.S. farm commodities. The mission of ERS is to develop and carry out a program of economic research designed to provide economic intelligence for users. FAS has responsibility for administering action programs; ERS does not. The mission of FAS and the vested interest that FAS thereby has in U.S. and world estimates may make it difficult for those in the Foreign Commodity Analysis Unit or the attaches to maintain objectivity with respect to assessments of the world situa - tion and outlook. The consensus **of OTA hearing witnesses was that it would be extremely difficult for USDA's world agricultural information system to reach full potential under the present organizational setup.**

Another organizational question was raised by Mr. Hjort. He pinpointed a serious flaw in the national agricultural information system operated by USDA, and said:

The responsibility for outlook and situation reports rests with ERS and the Outlook and Situation Board, but the authority for U.S. commodity supply-demand estimates is outside ERS. The reliability of the U.S. agricultural information system is, as a result, seriously impaired.[105]

Mr. Hjort concluded:

U.S. supply-demand estimates are developed by Interagency Commodity Estimates Committees (ICEC) chaired by the Agricultural Stabilization and Conservation Service (ASCS), Members of the committees are drawn from the Economic Research Service and Foreign Agricultural Service. Responsibiltiy for foreign trade estimates rests with the member from FAS; the responsibility for domestic estimates rests with the representative from the Economic Research Service. The Agricultural Stabilization and Conservation Service has the responsibility for administering price support programs for farmers, and FAS has responsibilities for administering export expansion programs, Both, therefore, have a vested interest in U.S. supply-demand estimates. USDA's Outlook and Situation Board approves outlook and situation reports on U.S. agriculture, but the ICEC's supply-demand estimates are taken as given by the Board. USDA's supply-demand estimates for the United States have been wide of the mark in recent years. While both domestic- and foreign-demand estimates have been in error, the magnitude of the error in the export estimate has been much larger either due to changes in the basic world food situation, faulty analyses, or bias. Investigations of the reasons for errors in the estimates have centered upon ERS, the agency with responsibility for the estimates but without authority (analogous to the Outlook and Situation Board).[106]

Several participants in the OTA study noted this need for organizational changes, either consolidation as noted by Mr. Keefe[107] or major reorganization as outlined by Mr. Hjort.[108]

In sum, the analysis shows two types of deficiencies in USDA's system, one caused by deficiencies in other systems—i.e., national and FAO, which require compensatory USDA action—and another caused by the USDA organizational structure, grounded in a potential for conflict of interest. Suggested improvements follow.

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SUGGESTED IMPROVEMENTS

The Office of Technology Assessment (OTA) study generated numerous suggestions as to how the existing USDA food information system might be improved. These suggestions have been grouped into three areas; the suggestions are listed first, followed by discussion on the significant items.

L Improving the Accuracy and Timeliness of the U.S. Food and Agricultural Information System

A. U.S. Department of Agriculture

1. Congress should hold hearings to determine what improvements have been made in the Foreign Agricultural Service and Economic Research Service since 1972-73 and what further improvements are feasible. (Food Advisory Committee, Hearings, pp. 9, 22-23.)

2. The USDA should create an economic intelligence agency which will combine the commodity analysts from FAS and ERS into one unit. (Hjort, Hearings, p. 95.)

3. The Agricultural Stabilization and Conservation Service must no longer head the Interagency Commodity Estimates Committees, and the chairmanship of the ICECS ought to be transferred to the agency responsible for the operation of the U.S. agricultural information system. (Hjort, Hearings, p. 95.)

4. The USDA should coordinate the information that its various agencies generate before the release of such information. (Sjerven, Hearings, pp. 138-1 39.)

5. The USDA world and feed grain summaries and outlook reports should be updated monthly. (Keefe, Hearings, p. 144.)

6. The USDA should generate summary reviews and speculative comments on new crop prospects, purchasing intentions, and the political pressure involved in other countries. (Frazier, Hearings, pp. 159-1 60.)

7. A World Crop Reporting Board should be set up within USDA that would review all sources of country production information (attache reports, foreign-released statistics, etc.) from all departments of the Government on a timely basis. This Board would set a forecast or estimate that would be acknowledged within Government (USDA, State, etc.) as the best number. (Harkness, Hearings, p. 134.)

8. The Secretary of Agriculture should be requested to establish an agricultural statistical review committee charged with the responsibility of making recommendations to the Congress and appropriate executive agencies for modernizing, coordinating, and standardizing the food and fiber series. (Food Advisory Committee, Hearings, pp. 7, 19-21 .)

9. The USDA should make an effort to report the farm input prices actually paid by farm and ranch operators in order to obtain timely information on the rapidly rising costs of production at the farm level. (Frazier, Hearings, p. 159.)

10. USDA's Economic Research Service should assume full responsibility for world food intelligence now shared by three agencies within USDA. (Cochrane and Seth, Hearings, pp. 201 -202.)

11. The ERS should:

    a. Strengthen its ability to analyze, evaluate, and interpret current world information on a monthly basis during the crop-growing and early harvest season;
    b. Increase its ability to analyze current world weather data and interpret their significance in terms of probable crop production in the current season;
    c. Develop world models of production, utilization, trade, and prices for more important agricultural commodities, especially grains, which permit timely evaluation of new data on a monthly basis during the growing and early harvest season. (Food Advisory Committee, Hearings, pp. 22-23.)

12. The ERS should have exclusive jurisdiction over the analysis and publication of outlook information. (Keefe, Hearings, p. 143.)

13. The Foreign Agricultural Service should train its attach& in data collection, expand its reporting capabilities in the critical developing countries, improve its data transmission and the timeliness of its summaries, improve its reports for the major commodities on probable import requirements of the importing countries, and finally, improve its reports on world agricultural requisite supplies and requirements, especially on fertilizer. (Food Advisory Committee, Hearings, pp. 22-23.)

B. Bureau of the Census

1. The U.S. Congress should study the desirability and feasibility of integrating the staff and activities of the Census of Agriculture with those of the Statistical Reporting Service of the Department of Agriculture. (Food Advisory Committee, Hearings, pp. 6, **21.)**

2. The Census of Agriculture should be replaced by sample surveys, and much of the census data would be better obtained annually over a 5-year period, with emphasis once every 5 years on generating county estimates. (Paarlberg, Hearings, p. 11 9.)

3. The Census of Agriculture ought to be abolished. (Trelogan, Hearings, p. 367.)

4. The Statistical Reporting Service ought to integrate the gathering of all agricultural data in its probability sampling programs. (Trelogan, Hearings, p. 356.)

5. The responsibilities for the Census of Agriculture should not be transferred to the Statistical Reporting Service. (Office of the Director, Bureau of the Census, Hearings, p. 373.)

6. It is exceedingly important to preserve the independence and integrity of the Bureau of the Census. The collection of benchmark data from a complete Census of Agriculture enterprises is a critical national priority. (Bureau of the Census, Hearings, p. 373.)

7. The Bureau of the Census should issue the reports of the Census of Manufactures on a more timely schedule. (Sjerven, Hearings, p. 138.)

C. Fertilizer

The several congressional committees having responsibility for the executive agencies that collect and publish the various series of data relating to fertilizer should conduct studies and hearings to determine ways, means, and costs of improving the fertilizer information systems. (Food Advisory Committee, Hearings, pp. 8, 20-21.)

D. General

1. More studies are needed to examine domestic wheat utilization by class and to treat livestock feeding in greater detail. (Sjerven, Hearings, p. 138.)

2. The food information institutions ought to use more simplified graphs or charts in order to summarize pertinent changes that may occur on a monthly basis in the food economy. Such a procedure would be beneficial to both marketing participants and consumers. (Keefe, Hearings, p. 1 44.)

3. Better world statistics on livestock numbers should receive appropriate priority. (Harkness, Hearings, p. 133.)

4. There should be a continuous flow of data on the economic aspects of land and water resource use and of data on the structure, costs, and practices of the farm input, food-processing, and distribution industries. (West, Hearings, p. 127.)

5. Government agency responsibilities should shift from providing a proliferation of projections and estimates to a coordination of the information' they generate. (Sjerven, Hearings, pp. 138-1 39.)

II. Integrating Nutrition Information Into the U.S. Food Information System

A. Consumer needs should receive a special emphasis in the management of information generated by the U.S. food economy. (Sjerven, Hearings, p. 138.)

B. There should be a continuous survey of food purchases by consumers—i.e., a weekly or monthly data survey of consumer food preferences-and developing trends in the public's purchasing habits should become institutionalized. (West, Hearings, pp. 126-1 27.)

C. The Congress should request that USDA's Food and Nutrition Service expand substantially its program evaluation studies. (Food Advisory Committee, Hearings, pp. 9-10.)

D. The United States should develop a national nutritional status surveillance program. A first step in such a development ought to involve the adequacy of design and integration of the ongoing nutrition surveys being conducted by the Department of Health, Education, and Welfare and the planned Household Food Consumption Survey to be conducted by the Department of Agriculture. (Food Advisory Committee, Hearings, pp. **9-10, 29-33.)**

III. Using Advanced Technologies

A. Experiments and analyses utilizing new technologies for obtaining and analyzing data should go forward on an expanding scale. (Food Advisory Committee, Hearings, pp. 9, 23-24.)

B. Remote sensing and weather data technologies reports should reach their users on a timely basis. (Sjerven, Hearings, p. 138.)

C. The United States should broaden its capabilities in satellite weather technologies in the context of a more comprehensive food information system. (Hathaway, Hearings, p. 79.)

D. Should Congress decide to support a global food information system based on advanced satellite technologies, it is strongly recommended that a centralized data-processing and analysis facility be established for the

multidisciplinary group of scientists responsible for its operation. Such a team ought to be self-contained and autonomous. (Park, Hearings, p. 327.)

E. The immediate employment of the LANDSAT satellite is an urgent priority. (Park, Hearings, p. 327.)

F. The global needs of agricultural weather forecasting demand a considerable increase in the number of agrometeorological stations and the reporting of their climatic information at the very least once every 10 days. (Park, Hearings, pp. 333-335.)

G. The National Oceanic and Atmospheric Administration (NOAA) should have advanced computers with enough capacity and speed to use data for the development of global climatic models. (White, Hearings, pp. 273-274.)

I. IMPROVING THE ACCURACY AND TIMELINESS OF THE U. S., FOOD AND AGRICULTURE INFORMATION SYSTEM

Although the Economic Research Service and the Foreign Agricultural Service have made substantial improvements since 1973, OTA participants noted additional improvements that they felt should be made. Timely and accurate information on food production, stocks, and prices in foreign countries is as important to the Congress as information on the domestic food industry. Yet USDA agencies that collect, analyze, and disseminate foreign information do not follow the same rigorous procedures in handling it as they apply to domestic crop, livestock, and price reports.

Objectivity is a prime requirement of a food and agriculture information system. At the present time the agency (FAS) which collects the foreign food information and issues most of the reports on foreign food production also has the mission of expanding farm exports. Both the quality and the objectivity of information gathered and analyzed under these conditions may be compromised.

Reports received from the USDA's attache network are the primary source of foreign food and agriculture information. Attache's prepare many reports and provide much information, but few are specialists in the collection or analysis of food data. These tasks are not perceived to be their primary mission. Frequent changes in attache assignments also adversely affect the quality of information they provide.

A long-range solution to this problem would be the employment of specialists in the collection and analysis of food information posted for extended periods in major food exporting and importing countries. **The near-term solution** is to require the attache to provide more precise data and information on the use of land, use of agricultural inputs, animal populations, income, prices, and other supply and demand factors. Inadequate analysis of available data, however, is recognized as an even greater and more serious weakness than inadequate data; thus the overall short-run improvement in the international food and agriculture information systems depends mainly on how many analysts are employed and how effective they are.

Neither USDA nor FAO (to be discussed in the following chapter) has the analytic capability to generate timely and reliable information for all commodities and countries

where existing national food information systems are now inadequate, A deeper analytic capability must be developed to improve the reliability of current assessments of the world situation and outlook for food and agriculture.

The consensus of **OTA participants was that a key way to harden this analytical capacity was through improvements in USDA's organizational structure, elimination of obsolete data series, and updating of other key series such as the Census of Agriculture and fertilizer information.**

Mr. Hjort feels that the objectivity of USDA's international and national food and agriculture information systems is threatened and its efficiency and effectiveness hampered by the current organizational structure of USDA agencies.[109] The responsibility for the international food information system is shared by two officials in the Office of the Secretary; and the system is operated by two completely separate agencies; one also having action program responsibilities that make it difficult to maintain objectivity.

The responsibility for reporting on the U.S. food situation and outlook rests with ERS and the Outlook and Situation Board, but the chairmanships of national commodity supply-demand estimates committees are held by staff members in the agency that administers farm programs, the Agricultural Stabilization and Conservation Service.

In the interests of improved objectivity, effectiveness, and efficiency, the responsibility for both the international and the national food information systems should be assigned to one official, who would have the sole mission of providing economic intelligence on U.S. and international food supplies and prices. The staffs that gather data, analyze it, and provide economic intelligence would be responsible to this official rather than to agencies having as their primary mission the expansion of farm exports or the maintenance of farm income. Reorganization was viewed by most as a necessary condition to achieving the maximum effectiveness of the national and international food systems operated by the Department of Agriculture.

Mr. Hjort discussed alternative means of accomplishing the necessary reorganization.[110] One method would be simply to transfer the Foreign Commodity Analysis Unit from FAS to ERS and make it another division of that agency. Another would be to combine the Foreign Commodity Analysis Unit from FAS with the Foreign Demand and Competition Division from ERS into a new agency, one with the sole mission of providing economic intelligence on world agriculture.[111] The third alternative would be to combine the foreign commodity analysts from FAS, the U.S. commodity analysts from ERS, and the foreign and national analysts from ERS into a single economic intelligence agency with responsibility for assessing and disseminating information of world and U.S. agriculture.

The potential for meeting objectivity criteria would be enhanced under any one of the reorganization alternatives, Overall efficiency and effectiveness would be lowest under the first alternative, higher under the second, and highest under the third. However, it is felt that even the first alternative would represent an improvement over the present organization simply because it would become possible for the first time for a single agency to plan and carry out a coordinated program of analysis. Efficiency and effectiveness would be higher under the second alternative because the system's operation would be directed by more senior professionals. The third alternative promises the highest efficiency and effectiveness, as it provides the opportunity to eliminate the duplication associated with the operation of two systems. It is not necessary to have one group of commodity analysts for the world and another for the United States. U.S.

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analysts cannot perform effectively unless they take the world situation and outlook into account; world analysts cannot perform effectively unless they take the U.S. situation and outlook into account. Efficiency and effectiveness would obviously be improved by combining the knowledge of these analysts.[112]

Among the improvements suggested by Mr. Hosea Harkness[113] and endorsed by several witnesses[114] was the creation of a World Crop Reporting Board in the U.S. Department of Agriculture[115] with responsibility for reviewing all national and international information on a timely basis and issuing reports that would be recognized as authoritative throughout the Government and the food industry. Harkness felt that regular monthly reports by such a Board—with official supplements when new developments warrant, including analysis of the current data—would be a substantial improvement over the current frequent release of unanalyzed data. Mr. Harkness recommended:

> ...that a World Crop Reporting Board be set up within the USDA that would review all sources of country production information (attache reports, foreign released statistics, weather-yield analysis, check data, etc.) from all departments of government on a timely basis, This Board would set a forecast or estimate that would be acknowledged within the Government (USDA, State, etc.) as the best number. Thus, we would eliminate duplicate numbers floating within Government. This would eventually lead to more credibility for the private user.[116]

Mr. Hume and Dr. West were asked to comment on this suggestion. Mr. Hume responded that in his view "this would inevitably slow up the providing of. . .information.[117]

Dr. West indicated that this kind of thing was done on an informal basis.[118] The principal objection or concern to the establishment of such a Board designed to develop a number to eliminate duplicate numbers was the delay that might be incurred from getting clearance for "the number."

. Seth and Cochrane felt that while this seemed to be a reasonable proposal, "we believe improving the present (Outlook and Situation) Board's operation and strengthening ERS and SRS would accomplish the same result and should be tried first.[119]

Regardless of action taken regarding a World Crop Reporting Board, the necessity for deeper capability for analysis of the factors influencing world agriculture seemed to be generally agreed upon by everyone. Additional analysts may be employed, but doing so and using them inefficiently would not be a cost-effective solution to the problem, Under a reorganization it may be necessary to increase the number of anaIysts and field staff of the new or augmented agency. However, while the need for developing, verifying, and using more sophisticated analytic techniques seems evident, this need not imply increased numbers of people. Instead, the task is to make more effective use of the analysts and positions now available,

Variation in national data keep the reliability, timeliness, and adequacy of USDA's world system below potential. There are two alternatives to prevent this: provide additional technical and financial assistance to help improve national agricultural information systems with respect to these attributes, or strengthen the analytic component of USDA's world system so that more reliable and timely national estimates can be generated within the system. Both approaches may be pursued, recognizing that the former will take longer to accomplish than the latter. In the near term, the only alternative is to improve the analytic capability of USDA's world system.[120]

Errors in estimates by the Interagency Commodity Estimates Committees also were singled out for correction. It is necessary to take program operations into account when developing supply-demand estimates, but the

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accountability for the estimates should rest with the agency organizationally responsible for them, Mr. Hjort felt that the chairmanship of these committees should be assigned to the agency with responsibility for operating the agricultural information system and that the members should be drawn from the agencies with responsibilities for programs that have an impact on supplies or demand.[121]

> The creation of an economic intelligence agency, and combining commodity analysts from FAS and ERS into one unit, provide the opportunity for improving reliability of U.S. supply-demand estimates, but this major flaw in USDA's national agricultural information system will continue to impair reliability unless the chairmanship of the ICECs are taken from ASCS.[122]

Seth and Cochrane noted a potential conflict of interest (real or apparent) in the present arrangement of the ICECs being chaired by an official of the Agricultural Stabilization and Conservation Service.

They agreed with Mr. Hjort:

> . . . that the chairmanship of the ICECs should be removed from ASCS. Further, responsibility for foreign trade estimates should be removed from FAS and representation of that agency on the supply-demand estimates committees should be removed.[123]

The Problems of Obsolescence

Many of the data series now being maintained by SRS were started 40 or 50 years ago.[124] They were designed to provide information about food and agriculture at that time. To the extent that the food and agriculture industry has changed since then, these older data series are based on obsolete concepts, definitions, and measurements. Maintaining obsolete data systems is wasteful. Analyzing obsolete data leads to inappropriate conclusions. One good start in improving the national food information system would be removal of outdated information prior to the collection of additional data for analysis.

This issue has gained increasing attention on the part of analysts in recent years, but it is a difficult one with which to deal. Failure to bring the series up to data, on the part of administrative officials charged with their collection and publication, is closely related to interests expressed by data users in the continuity of a series,

The Food Advisory Committee report[125] indicated that more rapid progress would probably be made if the Secretary of Agriculture were to establish an agricultural statistical review committee charged with the responsibility of making recommendations to the Congress and appropriate executive agencies for modernizing, coordinating, and standardizing the older food and fiber data series.

One example of obsolescence is found in the issue of whether farm statistics should be integrated.[126] Two sets of developments have necessitated changes in methods of collecting farm statistics. They are technological changes in farming and simultaneous progress in statistical technology,

Quality checks on the Censuses of Agriculture for 1964 and 1969 indicated that data were 8 and 17,6 percent incomplete, respectively. Typically, years rather than months elapsed between the time of collection of the data and the reports published. In short, agricultural census data no longer meet users' needs with respect to completeness and timeliness,

Methods for probability sampling to yield greater accuracy of estimates have been in use for current crop and livestock estimates for several years. They are now being expanded to gather economic data of this type previously made available by the Census of Agriculture after serious delays. The stage is set for the avoidance of considerable unnecessary duplication of effort through the integration of

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the Census of Agriculture activities and the probability sampling methods of the SRS.

The Food Advisory Committee report urged a study of the desirability and feasibility of integrating the staff and activities of the Census of Agriculture (Bureau of the Census, U.S. Department of Commerce) into the Statistical Reporting Service (Department of Agriculture) .[127]

The hearing record generated discussions on both sides of the issue. A paper prepared by Dr. Harry Trelogan suggests that the "integration of the present systems offers opportunities for alleviating these problems with no more expenditure for data collection than are now projected."[128] The statement submitted by the Bureau of the Census, however, makes the point that consolidation and integration "would not result in. . gains in quality, timeliness, and reduction in costs to the Government. . ."[129] In addition, the Census Bureau believes:

> It is exceedingly important that an independent agency, such as the Bureau of the Census, continue collecting benchmark data and that these data be obtained from a complete Census of Agriculture enterprises.[130]

Support for the integration and use of sampling procedures has been voiced by the National Association of State Departments of Agriculture in a resolution passed at its 1975 annual convention.[131] Professor Tweeten's testimony supported their position:

> We can also obtain more information about the structure of U.S. agriculture by moving resources now used in the agricultural census to the Statistical Reporting Service (SRS) as proposed. . .The agricultural census currently is processed much too slowly and is all too reluctantly made available in detail to analysts for policy research. Because SRS data are more reliable than those of the agricultural census (which is no longer a census but a mailed sample survey), much can be gained by moving census resources to SRS to obtain economies of size, timeliness, reliability and increased responsiveness to data needs.[132]

The USDA position on this issue was detailed by Dr. Paarlberg. He commented on the Food Advisory Committee report discussion on the timeliness and reliability of data as it relates to the Bureau of the Census, saying:

> The question of needed changes in the agricultural census, including possible transfer of the operation to SRS, is a complex issue without an immediately clear answer. What is clear is that the agricultural census program needs to be modernized to use current data gathering techniques, to more nearly meet the data needs in today's more specialized agriculture and to develop ways to produce the results in a more timely fashion. It is also clear that much closer coordination between Census and SRS needs to take place, and if the activities remain in two separate Federal departments, there should be greater provision for efficiencies of planning and operation.l33

Dr. Paarlberg felt that the census should be replaced by sample surveys and that much of the census data would be better obtained annually over 5-year periods with emphasis once each 5 years on generating county estimates.

> We consider the agricultural census enormously important, and we frankly feel that it has not been given the importance that it deserves in the Bureau of Census, and there has been much delay in coming out with the data. . . .We think that it could be improved and could be made more timely, and the questionnaires could be made more brief if they were targeted at the particular groups that must respond, We think it would be possible to update the techniques and use a probability sampling technique.[134]

Dr. Paarlberg exhibited bureaucratic restraint, saying:

> We are not ambitious to take over that service. If the census could be given greater importance, and brought out more quickly, we would be very happy to see it stay where it is, But if it is not being afforded the importance it deserves, then frankly we would look with favor on seeing that it was afforded that importance.[135]

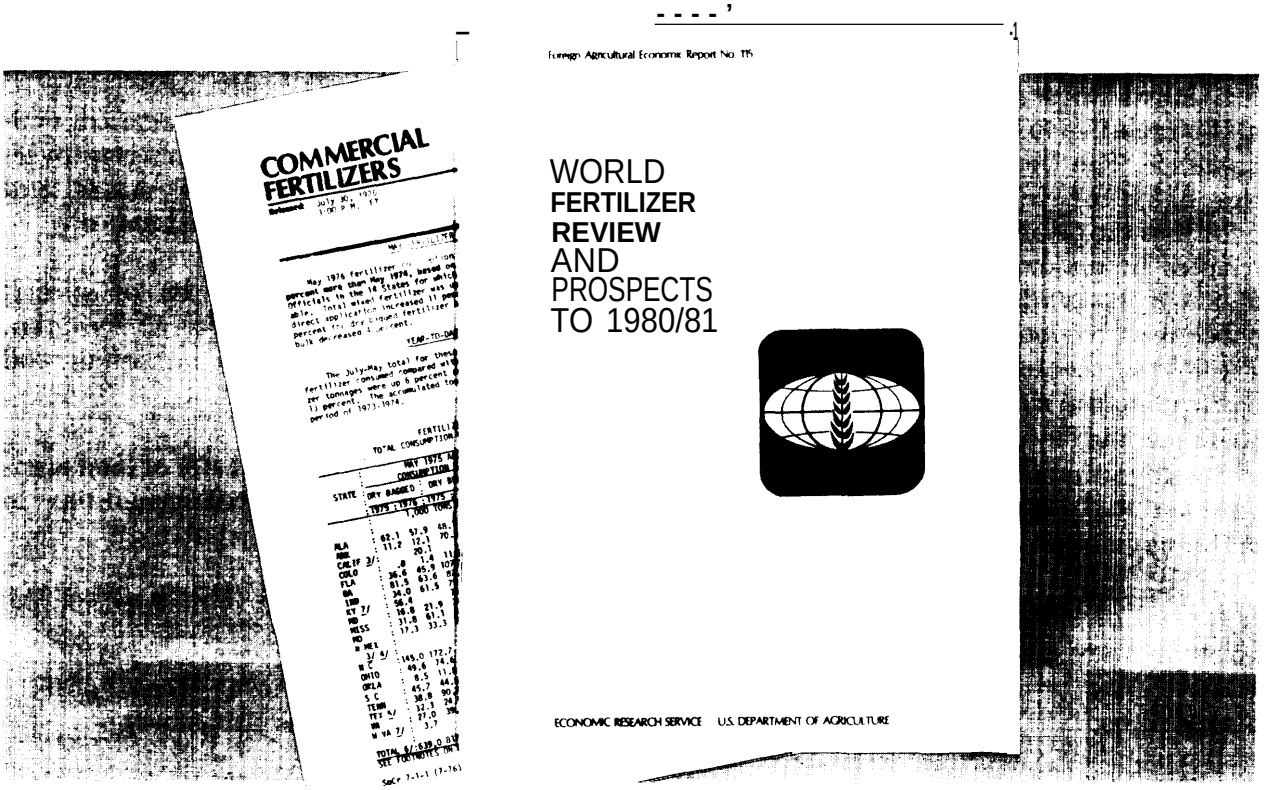
NOTE: Footnotes appear at end of chapter.

The collection of fertilizer information and its analysis and dissemination are shared by 10 governmental agencies and at least two industry-financed trade associations, The Bureau of the Census issues monthly reports on the production of inorganic fertilizer materials; the Bureau of Mines issues reports on potash, phosphate rock, and sulfur production; and the U.S. Tariff Commission issues reports on production of organic materials, especially urea. The SRS collects fertilizer utilization information from State regulatory agencies; and finally, the Bureau of Labor Statistics collects and publishes monthly fertilizer prices,

Users of these data are unhappy with this excessive fragmentation of fertilizer information, the poor quality of the data provided by some agencies, incompleteness in inventory data, and failure to issue the many reports on a coordinated time schedule, Although it may not be feasible to consolidate the collection of information on fertilizer materials, the quality of some of the data could be improved substantially, and their release could be better coordinated,

Regarding the OTA discussion of a more fully coordinated fertilizer information system, Dr. Paarlberg noted that USDA partipates in an Interagency Fertilizer Task Force established by the President's Economic Policy Board, He felt that this has been a useful activity and a forum for discussing problems and information on fertilizer. Dr. Paarlberg said that USDA looks to the Statistical Policy Division in the Office of Management and Budget as having the authority to bring about closer coordination in information that is scattered across several agencies of the Government.[136] (Figure 10 shows some of the reports on fertilizer information distributed by USDA).

Figure IO.—Fertilizer reports distributed by USDA-ERS



Options to Make the USDA Information System More Accurate and Timely

Congress has a range of options for making the U.S. food and agriculture information systems more timely and accurate. It may rely on the executive branch to make the improvements indicated by the above analysis. Many of the improvements indicated as needed could be achieved by the executive branch without any changes in legislation. Even in these cases, however, Congress, if it wishes, could speed the adoption of improvements by communications from committee chairmen and ranking minority members requesting that action be taken to achieve those improvements which could be made without additional legislation. The scheduling of oversight hearings and issuance of directives as a part of the appropriations process are other means of stimulating executive improvements.

Changes in existing legislation will be needed to achieve an integration of the Census of Agriculture and the sampling procedures of SRS. Changes in existing legislation also may be required to achieve significant improvement in the U.S. fertilizer information system,

Many of the improvements suggested could be achieved without additional governmental expenditures. The reorganization of FAS and ERS, creating a world economic intelligence unit, and the consolidation of the Census of Agriculture with SRS could be achieved without significant additional costs. The expected benefits, as indicated by OTA's study participants, should lead to substantial opportunities to improve the U.S. food information facilities,

11. INTEGRATING NUTRITION INFORMATION[137]

Throughout the world, food disappearance data are utilized as an indirect measure of the nutritional adequacy of food consumption. In the United States there is a plethora of information relative to food availability and disappearance, The Department of Agriculture, on the basis of food disappearance data, publishes the percentage of total nutrients contributed by major food groups and quantities of nutrients available per capita per day. It publishes a National Food Situation four times a year that contains many statistical tables portraying food supplies available, food disappearance, and food prices, **However, no agency of the Government collects and publishes relevant national data on the nutritional status of major population groups in the United States.**

A total of **903** bills dealing with food and nutrition were introduced into the 93rd Congress.[138] The principal nutrition issues appeared to be:

- Poverty as the principal correlation between hunger and nutritional deficiencies;
- Nutritional deficiencies associated with distorted food behavior, including overconsumption, found at all social and economic levels in the United States;
- Food and nutritional needs of special groups, such as pregnant women, preschool children, ethnic minorities, and the aged;
- The effort of a major transfer of food preparation and service responsibilities to the commercial sector; and
- The quality and safety of the food supply.

Difficulties of Obtaining Meaningful Nutrition Status Information

In 1969, a panel at the White House Conference on Food, Nutrition, and Health agreed

NOTE: Footnotes appear at end of chapter.

on the need to strive for two basic objectives in nutrition policy:

- The establishment of a monitoring "system to evaluate the effectiveness of Federal food distribution and other programs to improve nutritional status; and

- The establishment of a nutritional surveillance program to identify potential problems before large groups are adversely affected and as a basis for designing applied nutritional programs to correct nutritional deficiencies, especially among the poor.

Meaningful food consumption and nutrition surveillance information is far more difficult and far more costly to obtain than comparable information on food production. This arises primarily because of the difficulty of measuring nutrition deficiencies and related food consumption. Part of the high cost results from the fact that existing technologies require clinical analysis as a part of a comprehensive evaluation of an individual's nutritional status. Changing technologies might make less difficult the obtaining of useful information on the nutritional status on a more timely basis.

Nutritional scientists also are not fully agreed on the significance and reliability of specific tests for nutritional deficiencies. Further, information on nutritional status involves consideration of nutrition-related public health issues, where in many instances cause-and-effect relationships have not been fully established. It is because of these and other obstacles that little progress has been made in establishing a monitoring and surveillance program as recommended by the 1969 White House Conference,

Nutrition and Food Consumption Surveys

The Federal Government does, however, carry on two activities that provide nutrition information based on consumption rather than food disappearance, One is the Health and Nutrition Examination Surveys, which have been conducted for several years by the National Center for Health Statistics, HEW. Another is the nationwide Household Food Consumption Surveys, which were started in 1935 and have been continued at approximately lo-year intervals. The last one occurred in 1965, and another is in the planning stage, to be carried out in 1977. These surveys have been conducted by the Food Economics Institute of the Agricultural Research Service and its predecessor.

Users of the information provided by the Health and Nutritional Examination Surveys are critical of the small samples used, the failure to choose samples on a probability basis, and the excessive time lapse between gathering the data and publishing the results. Users of previous Household Food Consumption Surveys report that the design of these surveys was deficient. It proved impossible to relate the household food consumption information to important social and economic characteristics of the populations sampled.

Statisticians and automatic data-processing specialists are helping the USDA consumer and food economics staff to develop plans which will utilize the latest developments in sampling theory, automatic data-processing, and information transmission in the 1977 Household Food Consumption Survey, A closer integration of the health and nutrition surveys conducted by HEW and the Household Food Consumption Surveys conducted by USDA appears feasible and highly desirable.

Dr. West took exception to the OTA report's stating that the food and agricultural informa - tion system was basically an impersonal, production-oriented system. He said:

> Although we don't integrate nutrition information into our analysis, we have made a couple of other improvements in the past 3 years that we think are consumer-oriented, The first was to increase greatly the detail of our information on price spreads and components of marketing

costs. This is an effort to explain more fully the reasons for changes in food prices, who gets what from the consumer's food dollar, and to identify areas of research for improving the efficiency of the system.

A second effort to communicate to consumers is our recent introduction of a monthly TV news service on current agricultural information. We have been successful in getting these outlook oriented features used on prime-time evening news shows in most major television markets.[139]

Dr. West also mentioned startup efforts to better monitor food purchases:

...a continuous survey of consumer food purchases, so we can improve our forecasting and analytical capability with respect to food prices through better measures of price and income elasticities and demand shifters.[140]

Mr. Sjerven noted that a recent editorial in the Milling & Baking News called attention to the fact that:

Consumption analyses recently issued by the Economic Research Service of the U.S. Department of Agriculture fill a void in data about flour and baked food usage that rank publication of the information as an important turning point in breadstuffs knowledge. , ,The study provides facts about past and current flour consumption trends of a type and of a value never before available. . .[141]

,..The innovative efforts involved. , ,go right to the point of these hearings into the timeliness and accuracy of current information on agriculture. This study recognizes the limited usefulness of the Household Food Consumption Survey. , which is published only once every 10 years. Our excitement over this study also reflects the importance to domestic users of grain and to the growers of the data provided by the various bra riches of the Department of Agriculture.[142]

Mr. Sjerven suggested "that the measurement of nutritional well-being ought to be assigned to someone. ''[143]

NOTE: Footnotes appear at end of chapter.

Options for Integrating Nutrition Information

The concern of Congress regarding the cost-effectiveness of the Federal food assistance programs could be satisfied by appropriate program evaluation studies. Congress, in its annual appropriations for the several food assistance programs, could authorize that a small part of the appropriations be used for evaluation studies and mandate that they be undertaken. In addition, it could set general guidelines for such studies.

Although the Office of Management and Budget has the responsibility for reviewing and integrating Federal surveys, it does not appear to have expended much effort on the coordination of the HEW Health and Nutrition Examination Surveys and the USDA Household Food Consumption Surveys, Oversight hearings on the design and compatibility of these two ongoing surveys, if conducted by an appropriate congressional committee, should be effective in increasing by a significant amount the nutritional information developed in the analysis of the data from these two now largely unrelated surveys.

As advancing technology is applied in making nutritional tests and analyzing the resulting data, it should be possible to develop less costly nutritional surveillance techniques than have been available in the recent past, This process could be speeded up substantially by funding limited experimental programs in nutritional surveillance over a period of years, thereby hastening the time when it will be feasible to launch a national nutritional surveillance program as recommended by the 1969 White House Conference on Food, Nutrition, and Health.

If Congress allocated as little as 0.1 percent of the annual cost of the Federal food assistance programs to program evaluation studies, it would be spending $600,000 for such purposes. Clearly, Congress can require that adequate program evaluation studies be under-

taken without appreciably increasing total Federal food assistance program costs.

It is highly probable that expenditures of $100,000 to $300,000 annually on improved integration of ongoing surveys and experimental nutritional surveillance programs would result in" a significant improvement in nutrition information over a 5- to lo-year period.

The Food Advisory Committee report recognized that the nutrition component of their food information system report was not adequately covered. A supplementary statement prepared by Dr. Robert Nesheim, chairman of OTA's nutrition panel, details specific followup to be taken by the committee, His complete statement is found in the hearing record (pp. 341-344); however, this summary stresses the importance of nutrition in a food information system by appending key portions of Dr. Nesheim's statement to this summary and analysis, (See appendix IV.)

III. USING ADVANCED TECHNOLOGIES

OTA's Food Advisory Committee report expressed approval of various U.S. Government agency activities and plans for exploring the potential of advanced technologies to make agricultural information systems more effective. The committee report concluded:

> We believe it is urgent that the experiments and analyses utilizing new technologies for obtaining and analyzing data go forward on an expanding scale as preliminary results, including cost effectiveness analysis, justify. These newer technologies offer great promise for the years ahead.[144]

The committee report also noted the potential that advanced technologies have to improve agricultural information systems in developing countries. The report suggested that Congress:

> ,. direct AID (the Agency for International Development) to increase its technical assistance for improvement of agricultural information systems, including the introduction of advanced information technology, in developing countries now most deficient in their agricultural statistical in formation.[145]

OTA's hearings pursued these FAC comments. Papers were commissioned, and a panel of experts representing the private sector and four executive agencies—NationaI Aeronautics and Space Administration (NASA), U.S. Department of the Interior/Geological Survey, U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), and the U.S. Department of Agriculture, which have been cooperating for several years—examined issues relevant to these matters.[146]

Three satellite systems—LANDSAT, METSAT, and DATASAT—have some utility in the agricultural area, but our principal interest is with LANDSAT.[147]

LANDSAT is the NASA project which is attempting to determine the usefulness of satellite-acquired remote-sensing data. NASA's Mr. Charles Matthews discussed the advantages of sensors:

> These satellites utilize advanced sensors which gather data in the most effective regions of the spectrum (the visible infrared and eventually, microwave wavelengths), not just the visual wavelengths to which cameras are essentially limited, Another advantage of these sensors is that their data can be produced in digital form, permitting rapid processing and analysis by computer, This is essential both for handling the large volumes of data acquired and also to get the most information out of the data.[148]

LANDSAT–1 was launched in 1972; LANDSAT–2 in 1975; and LANDSAT–C wilI be

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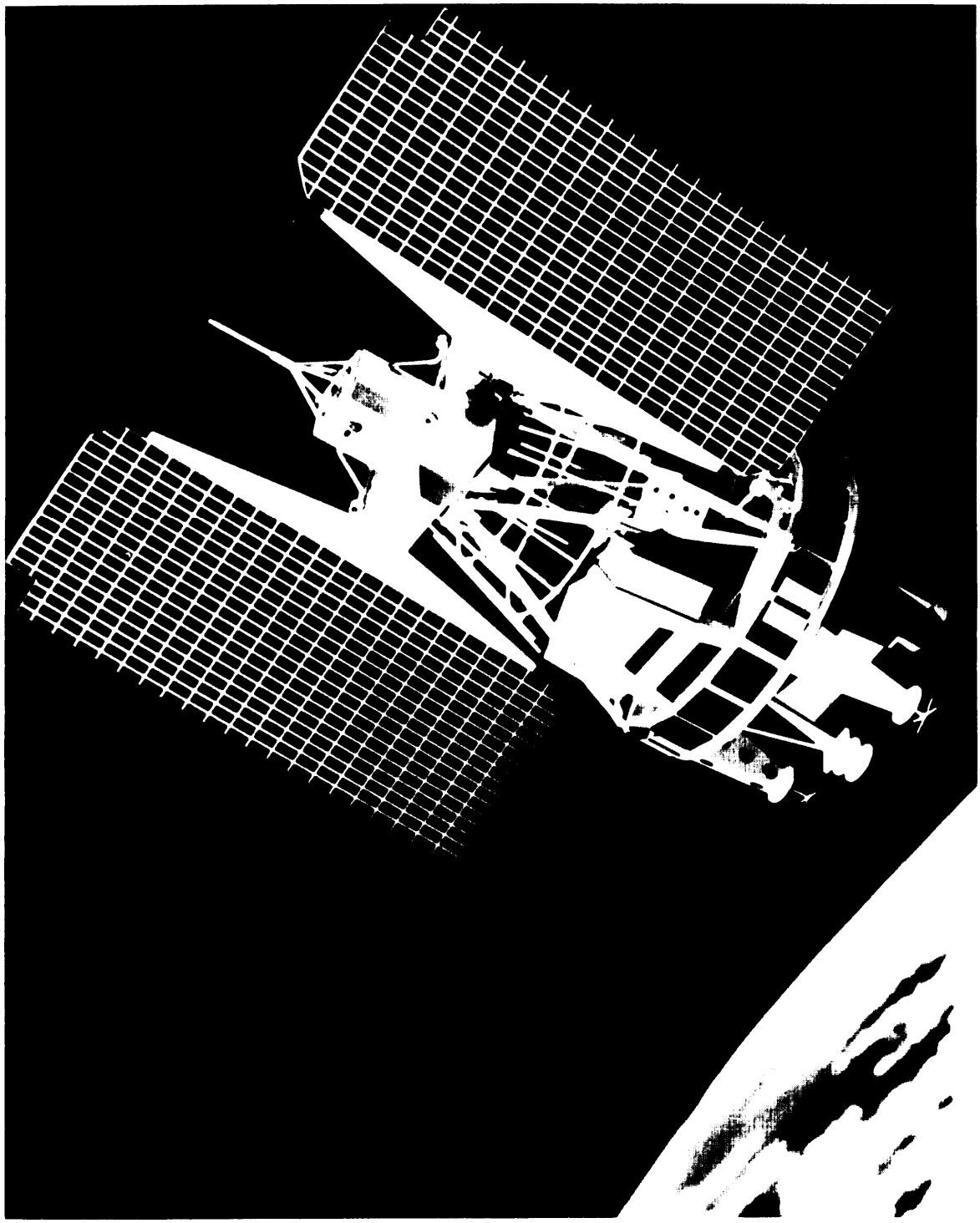

Figure 11.—Artist's concept of the Earth Resources Technology Satellite-A (ERTS-1— now LANDSAT-1). First U.S. satellite devoted exclusively to the study of the earth's natural resources. ***NASA photo***

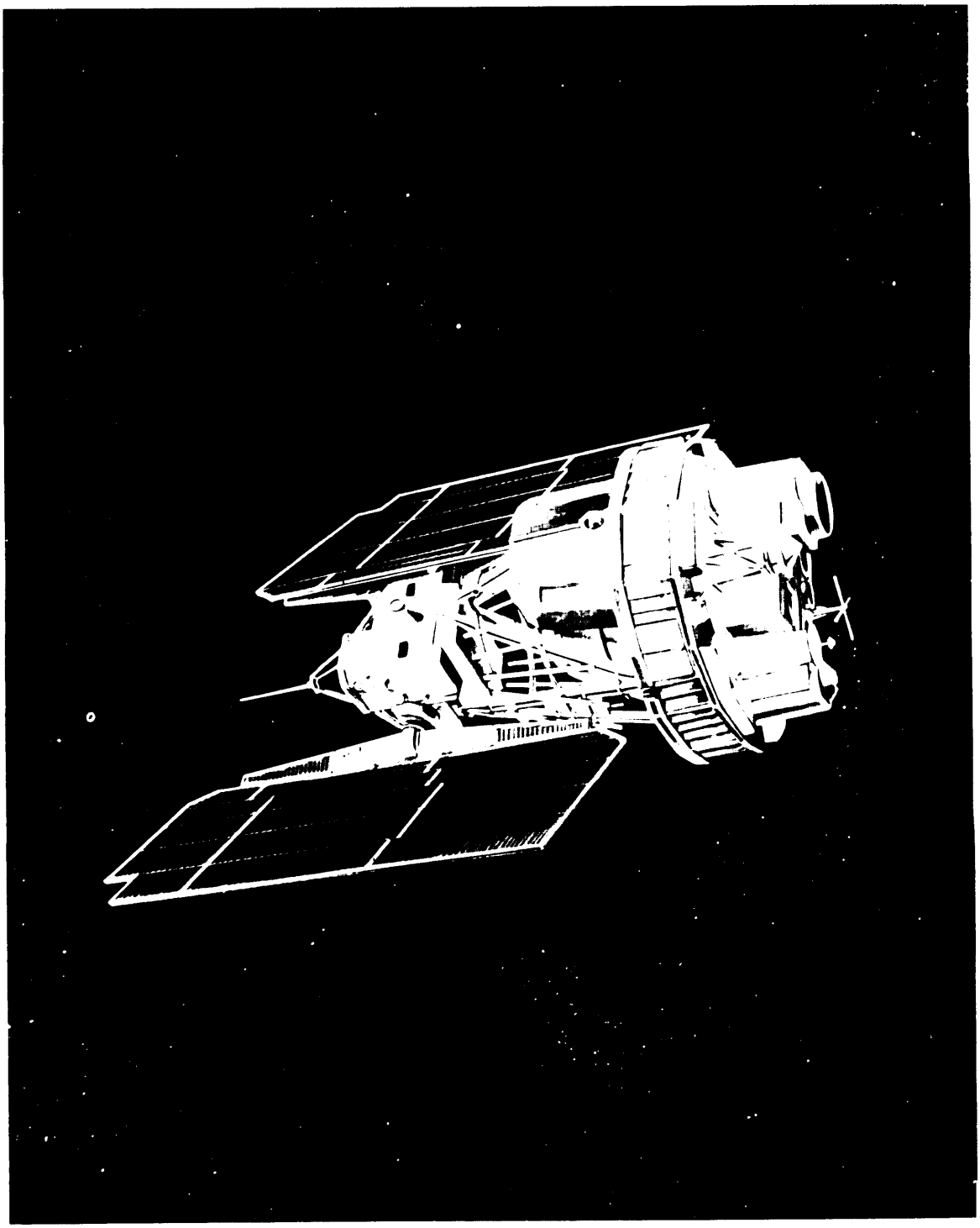

Figure 12.—Artist's concept of LANDSAT-2. LANDSAT-2 was launched on January 22, 975, into a near-perfect circular polar orbit at a distance of 568 miles. The Multispectral Scanner System that LANDSAT-2 carries provide images of the earth in four spectral bands. *NASA photo*

launched in 1977. These LANDSAT satellites are designed to be operative until 1980. LANDSAT data are expected to have a wide range of uses, and thus have received the attention of numerous U.S. executive agencies, including the Environmental Protection Agency, Department of Transportation, and Corps of Engineers, in addition to those to be discussed in this summary, Also in the private sector, the multinational grain exporters have shown considerable interest in LANDSAT, as well as international organizations, such as the Food and Agriculture Organization of the United Nations, World Meteorological Organization, and the International Wheat Council, “

Remote sensing technology shows progress toward providing information for:[149]

- water availability: demand (irrigation) and supply (snow cover);
- weather modification;
- irrigated land inventories;
- impacts of changing land use on agriculture;
- rangeland management;
- flood mapping;
- indications of climatic change;
- exploration for phosphates for fertilizer production;
- energy resources;
- demography;
- soil classification;
- crop inventories:
- plant figure estimates; and
- acreage devoted to agriculture, both in the United States and within other nations.

The advantages to be gained from the use of remote sensing seem to be legion. Mr. Matthews and Dr. Howard Hill (USDA) both noted the benefits of remote-sensing information,

Dr. Hill:

> Quicker and better information on world crops could: 1) help the United States and other countries to better manage agricultural production and to minimize fluctuation in price and trade volumes; 2) provide early warnings of crop shortages due to adverse weather; 3) provide timely indications of crop diseases and insect infestations which could affect world food supplies; and 4) provide production and supply information to international organizations such as the Food and Agriculture Organization for use in carrying out their responsibilities.[150]

Mr. Matthews:

> ...more accurate and timely knowledge of current and projected world crop production. . ,is required in planning and affects crop production and distribution. Exports to other countries, possibly involving millions of tons of grain, could be more effectively planned with less disruption to domestic markets and with better general economic effectiveness if world crop production could be readily estimated more in advance and on a continuing basis. Planting, marketing aid, and transportation decisions in producing countries are all based on crop inventory information, which is often available only after harvest and is frequently of uncertain accuracy in many countries. ., .A crop inventory system utilizing remote-sensing technology and the global meteorological system appears to offer great potential for upgrading existing information-gathering capabilities and for contributing to a more long-range solution of the food supply problem. , .[151]

He pointed out that advanced technologies, combined with current crop estimating methods and historical production data, help reduce the annual uncertainties affecting the management and marketing of major crops. Faster, earlier, and more accurate forecasts should assist in rational planning for the more effective use of supplies and should improve emergency food distribution both in the United States and abroad.[152]

While noting the advantages, Mr. Matthews was quick to point out that remote sensing was not expected to be a substitute for present traditional sources of information:

> The accuracy of the satellite techniques. , are in most cases dependent on good supporting surface measurements (ground truth). That is, the satellite information generally cannot stand

NOTE: Footnotes appear at end of chapter,

> alone without good point source data. The advantage of the satellite is not in replacing the in situ supporting measurements but in generalizing these measurements to areas so vast (country or regional scale or larger) that no other known technique can provide the integrating information.[153]

In mid-1973 the Secretary of Agriculture, as part of the Department's continuing efforts to apply advances in technology to improving available food and agriculture information, created a Remote Sensing User Requirements Task Force with representatives from most departmental agencies, Eight of these agencies employ remote-sensing data in their programs, This task force has completed its cataloging of the Department's remote-sensing information requirements. Over 2,000 items of information useful to the Department's programs were identified as being potentially collectible by remote-sensing techniques, A task force implementation team—made up of USDA specialists, representatives from NASA, the Department of the Interior, and universities—has analyzed the requirements of the different programs in terms of priority of needs and available technology, Next, the cost-effectiveness of applications will be studied; and finally, a proposal for an integrated research, development, and implementation program will be submitted to the Secretary of Agriculture in fiscal year 1978.

Responding to the question of the use of remote sensing. Assistant Secretary Bell gave a personal view:

> I think that in 4 to 5 years from now, the remote sensing will be very beneficial to us for crop forecasting, not only in the Soviet Union but in other places.[154]

He reviewed the present U.S. use of satellites to photograph Soviet crops:

> We are using the satellite to give us information on the Soviet crop situation. At this stage, the usefulness is quite limited, . .The Soviet Union becomes much more hazardous in terms of trying to estimate than our own country. because of where it is geographically located. It is so much further north, the season is much shorter, and it is subject to change very quickly.[155]

The Large Area Crop Inventory Experiment (LACIE) is the best example of USDA's effort to exploit advanced technology and improve its agricultural information system. LACIE is the first attempt to use and measure the cost/benefit of such use in the agricultural area. This experiment pulls together several new and emerging technologies into one comprehensive system.

LACIE uses data from LANDSAT – 1 and –2 and from meteorological satellites and existing worldwide meteorological ground data systems in an experiment aimed at improving global crop production estimates by USDA's Foreign Agricultural Service. Figures 13, 14, 15, and 16 are various types of satellite photographs utilized in information gathering,

Mr. Hume indicated that the LACIE system could inform us of the spread of crop disease and insect infestation which could affect world food supplies; it could flash an early alert of crop shortfalls due to adverse weather and provide improved production estimates to international organizations.[156]

Dr. Hill explained the LACIE program:[157]

> LACIE will be carried out in three phases. Phase 1, carried out in 1975, tested acreage estimating capabilities in selected wheat-producing areas of the United States. Wheat yield models were developed during this phase. Phases 2 and 3 will test LACIE capabilities to estimate wheat area, yield, and production in the United States and other wheat-producing regions. Phase 2 began in October 1975 and Phase 3 begins October 1976. Monthly crop forecasts will be prepared during the growing season. Associated research and development and tests of new techniques for crop identification measurement and yield estimation will be conducted throughout the experiment. . , It is important to stress that LACIE

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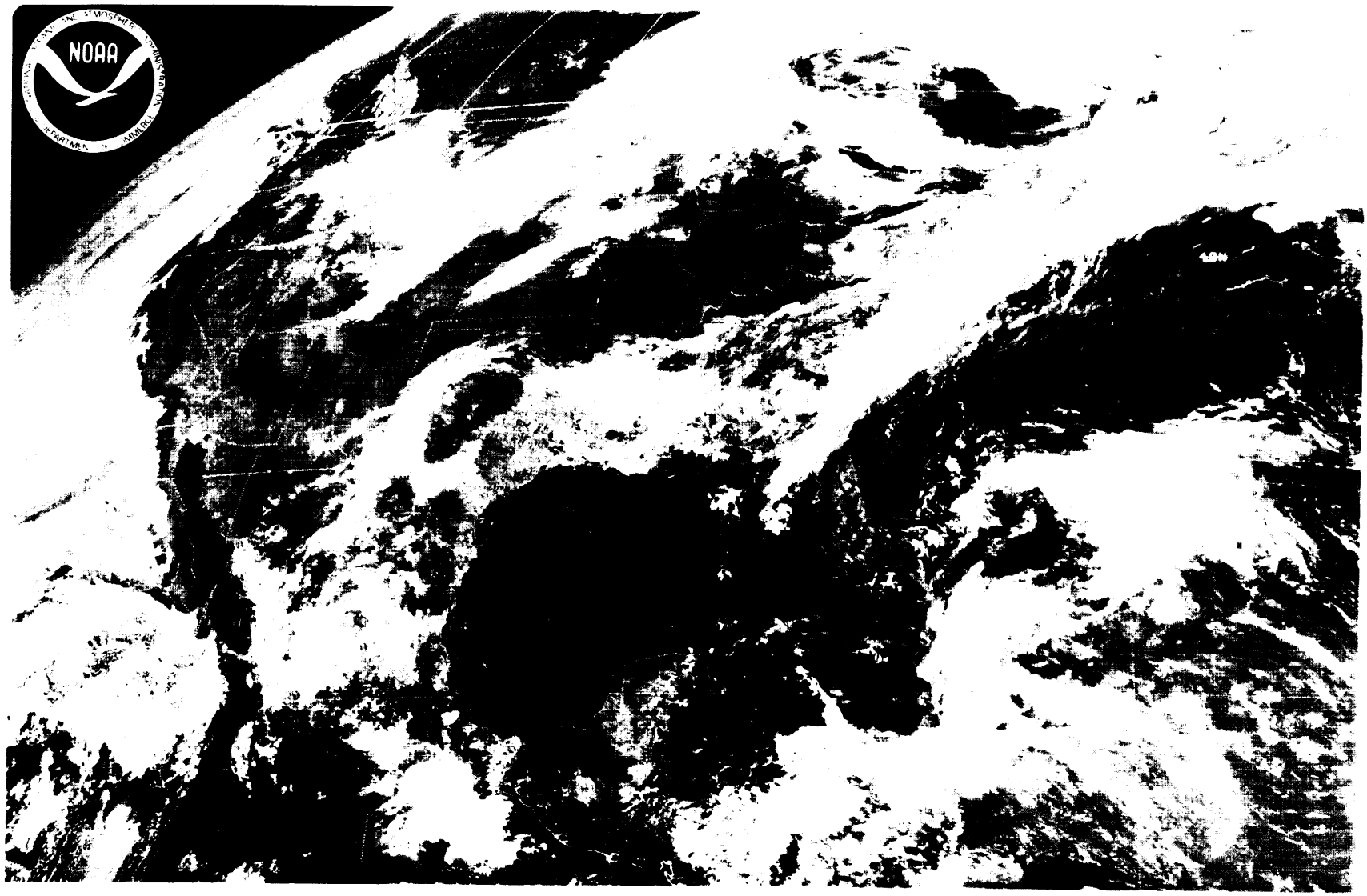
Figur~ 13.—NASA/NOAA satellite photograph shows cloud cover over the U.S. and Mexico. ***NOAA photo***



gure 14.· F s pho o map o he 48 con guous S a es o he Un ed S a es eve assembled from
sa e e mages was p oduced o NASA by he USDA s So Conse va on Service.
The map was p oduced om 595 b ack and wh e c oud ee mages
e u ned om ERTS a an a ude o 560 m es *NASA pho o*

Figure 15.—A black and white copy of a color photograph taken by ERTS-1 of the area between Boston, Massachusetts and Norfolk, Virginia. The original color photograph contained 3 colors: bright red--depicting healthy crops, trees, and vegetation; industrial areas show up green or dark gray; clear water as black; suburban areas in light pink; and barren lands as light gray. NASA *photo*

Figure 16.—Infrared channel image showing most of Europe from NOAA 4 Satellite, May 8, 1976,

is an experiment, and recommendations for future program use will be based on the outcome of evaluations that are made as the experiment proceeds, , . .Although LACIE now is limited to wheat, it is expected that programs and techniques developed during the experiment can be applied to the estimation of other agricultural crops and land use. If successful and if found to be cost-effective, a crop forecasting system utilizing the earlier mentioned technologies would provide better and more timely crop estimates as inputs to the Department's international crop information collection and reporting system,

LACIE is a large and technically complex undertaking, involving close cooperation between two Departments (Agriculture and Commerce), one independent Agency (NASA), and several agencies within each of the Departments. The present experimental approach should, in time, be replaced by a user system capable of applying current technology and the advanced technology now planned for the 1980's. Thus LACIE is providing an environment both for testing technology—including future technology relevant to crop identification and yield forecasting—and for determining how best to utilize modern analytic capabilities in carrying out an information function.[158]

Dr. Hill also discussed advanced technology, including the use of satellites with respect to the Foreign Agricultural Service, the Statistical Reporting Service, and the Economic Research Service,:

Foreign Agricultural Service

The backbone of the Foreign Agricultural Service information system is its Agricultural Attache Reporting System, which relies on attach& stationed in 63 posts around the world reporting on 82 countries,

It is necessary to aggregate, process, and summarize to a great extent the high volume of detailed information concerning foreign production, imports, exports, consumption, and stocks to get a meaningful picture of existing world stocks of food and feed grains and the potential demand for U.S. agricultural products. The Foreign Agricultural Service utilizes a computer system for storage and retrieval of this information as well as for statistical analysis and simple modeling to support its Foreign Commodity operation.

The Foreign Agricultural Service plans to make future use of advanced technology where it is both cost effective and funded, Plans include making FAS's computerized information systems more readily accessible to economists and commodity analysts through interactive computer terminals in commodity divisions. This will allow FAS economists to have more current information when it is needed and facilitate statistical analysis and econometric modeling,

FAS also hopes to be able to employ advanced techniques associated with intercontinental message switching and data transmission to improve attache information collection and reporting. The actual use of these technologies, however, will depend upon the outcome of a future cost benefit analysis and the availability of funds for such a project.

Statistical Reporting Service

Since the launch of LANDSAT–1 (ERTS 1) in 1972, the Statistical Reporting Service has conducted a continuing program to investigate the potential use of this imagery as a tool for collecting agricultural information, The primary thrust of the work to date has been in the area of crop identification and the development of methods to estimate crop acreages from LANDSAT imagery. Key components of this system under study are: (1) design and development of a flexible automated computerized data handling system for data conversion, calibration, interpretation, pattern recognition and statistical analysis; (2) development of a multistage sampling design that will utilize LANDSAT data, ground observations and related data in the estimation process; (3) analyzing data acquired considering accuracy, data acquisition cost, coverage, and availability for optimizing number and size of ground sample segments; (4) evaluation of alternative land use and crop classification systems using LANDSAT data for improving current SRS sampling frames; and (5) comparisons of crop identification and classification results from high altitude aircraft photography and LANDSAT to determine potential improvements in classification that could occur with better resolution satellite imagery,

Research results show that LA NDSAT classification accuracy for crops is closely related to field size, field shape, and diversity of crops

NOTE: Footnotes appear at end of chapter.

produced, Accuracy ranges from about 90 percent for Southwest Kansas with 4 crops down to 40 percent for central Idaho with 12 crops. Classification accuracy was improved, ranging to about 80 percent for 15 crops in Idaho, when higher resolution aerial photography was used. However, operational problems related to handling large volumes of data in such a system must be resolved before it can be tested for a large area.

Computer software has been developed that can match and retrieve LANDSAT data and corresponding ground truth sample data and estimates. This system allows LANDSAT information to be correlated with ground truth data obtained from routine field surveys.

The correlation (R) of LANDSAT data and SRS ground truth data for identical areas ranges from 0,5 up to 0,8. We believe that the LANDSAT data can be used to improve existing acreage estimates. Further study will be conducted to test this theory for other areas of the country and to develop cost estimates for the potential improvements using LANDSAT and other survey procedures.

LANDSAT data will be processed on the ILLIAC IV Computer (a parallel processing system using 64 computers linked together and a separate computer serving as the Central Processing Unit). This computer can process over 7 million pixels (data points) in about 12 minutes. A digitizer that generates a system of coordinates is used to extract sample segment data from LA NDSAT frames (tapes) for correcting classification errors, using ground truth acquired by personal enumeration of sample segments.

Problems that must be resolved before this technology can be put into any operation system include: (1) earlier availability of LANDSAT tapes, (2) improvements in the ability to extend crop signatures between LANDSAT frames, and (3) refinements in specified crop signatures that will improve classification and measurement accuracy.

The use of photography for making orchard tree and fruit counts also is being researched. A computer model uses digitized information from aerial and ground photographs. Results show that fruit trees as well as mature oranges, apples, and peaches can be successfully counted from data obtained from photographs, The tree counts can be used in sample surveys to estimate tree populations while the automated fruit counting system can be used in a multistage sampling design to more precisely estimate the number of fruits per tree.

Economic Research Service

The Economic Research Service provides economic information on the agricultural sector to public and private decisionmakers. The task has become more difficult as U.S. agriculture moves away from controls and comes more directly under the influence of domestic and foreign economic conditions. ERS has recognized the need to apply advanced techniques to problems of data management and it recently centralized its automatic data processing services into one unit, consisting of a data storage system linked to a generalized analytical package for estimating relations, making variable transformations, plotting data, and conducting statistical analyses, This technology will aid analysts by reducing the time required to conduct an analysis while increasing the amount of data which can be analyzed. Quality and timeliness of the analyses will be improved and other agricultural analysts will be able to retrieve data from the system more quickly. Ultimately, this will benefit the decisionmaker through improved information on which to base decisions. [159]

Tentative Conclusions About LACIE

In reviewing and analyzing the LACIE program, Mr. Matthews concluded that:

> Preliminary indications, based upon our initial assessments of the first year's performance, are that the LACIE acreage estimation techniques are generally adequate, and that with incorporation of certain technical changes, desired accuracy goals can be achieved.[160]

Others agreed that the first year's results have been favorable. Dr. White said: "In our opinion LACIE has tremendous potential for providing prompt, objective worldwide information on critical crops. ''[161]

However, there are impediments to fuller use of remote-sensing data. Agencies with

NOTE: Footnotes appear at end of chapter.

operational responsibilities expressed caution in becoming dependent on LANDSAT data, Since, LACIE is essentially dependent upon LANDSAT, three deficiencies are relevant to future use of remote sensing in an agricultural information system:

1. LACIE is experimental, There is no assurancy of continuity beyond about 1980 or even earlier if a spacecraft or launch vehicle fails.

2. Data are not available soon enough to be used in making time-critical decisions,

3. Standard photographic products contain less than the complete data content of the original digital data, thus precluding their use in some unique applications,

Dr. John DeNoyer of the Geological Survey (Department of the Interior) summed up these findings this way:

> The greatest bottlenecks in terms of operational uses are questions of continuity of follow-on satellites similar to LANDSAT, quality of data provided to users, timeliness or currency of data when it reaches the user, and transfer of technology to users.[162]

The last two reasons are technical. The solutions are available and NASA and the Earth Resources Observation Systems (EROS) data center are augmenting their data-processing and distribution systems to make the necessary improvements. Dr. DeNoyer said that to assure continutiy "would require a commitment by the United States and appropriate funding levels to support an operational program."[163] In the panel's view, failure to make such a commitment would keep the United States from continuing its leadership in global earth resources satellite activities.

The principal and overriding issues that emerge from a synthesis of the prepared papers, the testimony of individuals at the hearings, and the answers to questions that were submitted after the hearing is whether remote-sensing technology **can be applied on an operational basis within a food system; and whether the LACIE program, although not yet complete, has provided adequate information to justify U.S. Government financial commitment to assure expert user agencies of its continuous availability.**

Table 2 details the USDA budget commitment to LACIE and other related USDA remote-sensing activities. The low level of funds committed emphasizes the distinction between experimental and operational uses. Dr. Hill stressed this:

> If a decision is made to make LACIE operational, the requirement of a system with a capability to provide routine repetitive international crop forecasts would require a continuing flow of earth resources and meteorological data which are available to the user within a short time after acquisition, are repeated at frequent intervals throughout the growing season and are suitable for computer processing and analysis. Of course, a decision to implement a crop forecasting system at the end of LACIE also is contingent on a determination that information generated is sufficiently accurate, timely, and cost-effective to warrant an investment in such a program.[164]

The most positive conclusions were reached by the only nongovernment expert on the panel, Dr. Arch Park of Earth Resources Satellite Corporation, who said:

> Current earth-observing satellites have demonstrated that with the proper technical, scientific, and institutional support, they can be employed in an operational system designed to provide a continuous overview of agricultural production and agricultural land use on a global basis with the inherent capability to forecast production in advance of harvest.[165]

Dr Park noted that some of the present LANDSAT deficiencies had to do with spatial, spectral, and temporal resolution, format, and throughput,[166] and he added that lack of an approved operational program has had a bad impact on agricultural investigations.[167]

NOTE: Footnotes appear at end of chapter,

Table 2.—United States Department of Agriculture* —Remote Sensing
(Dollars in thousands)

Agency	Program level		
	FY1975 (Actual)	FY1976 (Estimate)	FY1977 (Budget request)
Large Area Crop Inventory Experiment (LACIE)			
Foreign Agricultural Service	—	$2,000	$2,850
Agricultural Stabilization and Conservation Service	$950	—	—
Economic Research Service	—	—	—
Statistical Reporting Service	—	—	—
Agricultural Research Service	—	—	—
Soil Conservation Service	—	—	—
Total LACIE	950	2,000	2,850
Other Remote Sensing			
Animal and Plant Health Inspection Service	50	22	51
Agricultural Research Service	380	349	508
Agricultural Stabilization and Conservation Service	2,722	2,610	2,646
Cooperative State Research Service	143	160	177
Economic Research Service	30	14	35
Forest Service	1,590	1,770	1,925
Soil Conservation Service	120	152	174
Statistical Reporting Service	215	796	799
Total, Other Remote Sensing	5,250	5,873	6,315
Total USDA Remote Sensing	$6,200	$7,873	$9,165

'Detailed statement of Dr. Don Paarlberg, Director-of Agricultural Economics, U.S. Department of Agriculture. Prepared for Committee on Aeronautical and Space Sciences, United States Senate, February 5, 1976.

He concluded that time from acquisition of the data to delivery of that data (now about 3 weeks):

> ...is perhaps the most serious deficiency in the present LANDSAT program, and denies to the serious investigator the ability to conduct an experiment in anything like realtime. It is in every case an after-the-fact analysis of the data. This has had a serious impact on the experimental program in NASA, and has resulted in a lack of serious agricultural investigations. , .[168]

Consensus and Conclusion

Two major sources of information are utilized in food information systems operated by national governments, international organizations, and private firms. They are satellite data and traditional collateral data.

NOTE: Footnotes appear atendof chapter.

New technologies are becoming available to support the traditional manner in which information is collected, analyzed, and disseminated. As Mr. Matthews noted in his testimony:

> ,..traditional systems were designed to cope with traditional problems, which the international food crisis is not. To be effective, contributions for new systems will be required.[169]

New systems that can address major requirements for: (1) worldwide standardized data collection relating primarily to food supply but also to food demand; (z) rapid data processing; and (3) accurate data analysis were described:

> These (new) techniques involve the use of remote-sensing satellites to provide large area, worldwide, repetitive coverage as well as weather conditions affecting agricultural yield, These satellites utilize advanced sensors which gather data in the most effective regions of the spectrum, . .
>
> (These) data. . can be produced in digital form permitting rapid processing and analysis by the computer, This is essential both for handling the large volumes of data acquired and also to get the most information out of the computer.[170]

In sum, Mr. Matthews concluded that a "marriage of the satellite, sensor, and computer, and in conjunction with traditional techniques, (makes) a worldwide food information system. . .possible, ''[171] (Emphasis supplied)

Many capabilities of remote sensing have been demonstrated. Others are in the research stage, Still more areas of application have not been started, The entire potential for using remote-sensing technology cannot be adequately measured at this time. However, the consensus of the panel is that the demonstrated capabilities do represent a major contribution toward achieving many information needs, More emphasis needs to be placed on physical models to turn data into useful information and still more attention needs to be placed on using this information for real management decisions,

A recent (January 30, 1976) General Accounting Office (GAO) study of NASA's Land Satellite Project supports a major theme found in OTA's analysis:

> None of the Federal agencies involved in the LANDSAT project has developed a long-range comprehensive plan which includes user requirements to assist in deciding if and when LANDSAT should become an operational system.
>
> Related to this is the question of the Federal Government's role in supporting satellite-based remote-sensing technology.[172]

The GAO study reported that the cost-benefit studies performed separately by NASA and the Department of the Interior showed divergent results because of different assumptions used.[173]

The GAO report recommended that:

> NASA take the initiative to lead the other participating agencies in developing a plan which includes requirements, milestones, and dates for evaluating progress being made toward the goal of deciding if and when there should be an operational earth resources satellite system, . . .Such a plan must postulate a Federal Government policy role in satellite-based remote-sensing technology. . . (addressing) 1) the assignments of roles and responsibilities to the involved agencies, 2) interrelationships among oceanographic, meteorological, and earth resources satellite systems, 3) alternative organizational arrangements for operational systems reflecting differing degrees of Government, private sector, and international participation, and 4) estimated resource and funds requirements to be filled by the Federal Government.[174]

Dr. Park, understandably the most outspoken witness on the panel, concluded that:

> . . such a system is feasible, that both the requisite hardware and software exist, and that the

NOTE: Footnotes appear at end of chapter.

> creation of such an operational system would provide the most appropriate base for the orderly development of foreseeable technological improve ment.[175]

He feels that the experimental phase of the program was finished when NASA demonstrated that LANDSAT–l worked successfully in orbit. Thus, Dr. Park believes that the only important function which should be changed in terms of the existing program is a commitment by the user agencies to provide an analytical operational capability that is presently missing in some agencies of the Government. In addition, Dr. Park strongly urged "that a centralized data processing and analysis facility be created for the staff that will operate it.''[176]

Options for Accelerating the Use of Advanced Technology

The use of remote-sensing data clearly holds great promise for increasing the timeliness, coverage, and analysis of food and agricultural information. Most agencies make use of advanced technologies to obtain more information and/or conduct more sophisticated analyses of available data.

The use of advanced technology is presently constrained by the lack of a follow through commitment to make remote sensing an operational program, This is imbedded in budget. Congress, to a substantial extent, speeds or slows the adoption of advanced technology by its appropriations for this phase of an agency's program, As noted above, it has authorized an experimental remote-sensing program involving NASA and the Departments of the Interior, Agriculture, and Commerce until 1980. Governmental agencies are finding these remote-sensing data highly useful but are reluctant to become dependent on a source of information which may not continue after 1980. **An early decision to authorize a continuing LANDSAT program would speed the adoption and broaden the use of remote-sensing data.**

The LANDSAT program appears to be even more valuable in making international information available to the United States on a timely basis than in increasing the information available on domestic food production. Congress may wish to take the leadership in exploring the possibilities of increasing international cooperation in LANDSAT programs.

The great promise of improved coverage and timeliness in a food information system based on the collection and analysis of remote-sensing data can be realized only at a substantial increase in total information costs. At this stage it would appear to be on the order of several hundred million dollars annually.

NOTE: Footnotes appear at end of chapter.

FOOTNOTES

[1]Noted by Assistant Secretary of Agriculture Bell as "the most effective international body in the gathering and analyzing and dissemination of (wheat) information. " Hearings, p. 42.

The principal groups worth noting are. Organization for Economic Cooperation and Development (OECD); International Cotton Advisory Committee; World Meteorological Organization (WMO); International Monetary Fund (IMF); International Bank for Reconstruction and Development (World Bank).

[3]In addition to the Department of Agriculture, other executive agencies are involved in food information systems.

The Bureau of the Census in the Department of Commerce is a major producer of time series data. Its major report in this area is the Census of Agriculture. A comprehensive document entitled "Food Industries Data Sources" has been prepared by the Department of Commerce (March 1975) outlining the data published by the Federal Government and selected private groups.

The Department of Labor's Bureau of Labor Statistics conducts monthly surveys of consumer and wholesale prices, which include many food items.

The National Center for Health Statistics of the Department of Health, Education, and Welfare conducts the Health and Nutrition Examination Survey (HANES), which involves taking a 24-hour dietary history and checking the health of participants. The survey is conducted from mobile laboratories moved from city to city.

The Federal Trade Commission collects considerable data on the food industry through special surveys, used as a basis for regulating competition and unfair trade practices.

Others—such as the Department of State, the National Science Foundation, and the National Academy of Sciences—issue reports dealing with food and agriculture matters from time to time.

[4]Hearings, p. 52. Assistant Secretary of Agriculture Richard Bell was questioned as to how the Department of Agriculture became aware of impending Soviet grain purchases in 1975, Senator Humphrey asked, "How did Secretary Butz learn of the Soviet's grain-buying plans in July 1975?" Secretary Bell responded:

> Our first information . . regarding the Soviet purchase intentions in fact came to us through the export firms.
>
> The export firms for the past year have been almost in constant contact with Soviet buyers; and they go in and out of Moscow almost weekly, and there is something there generally every day.
>
> We have asked them to keep us posted on the Soviet attitudes and information. They have done a good job of doing that. They have generally given us a report on every trip in and on every trip out and in June 1975 they began to tell us that they felt the Soviets were showing an interest and were probably going to buy.

Assistant Secretary Bell went on to say that when it appeared that the grain companies were about to negotiate agreements, they kept the Department of Agriculture "informed of the quantities they were talking about; each firm told us the quantities they were working on; we kept that information generally to ourselves about what each company was doing. . ."

[5]Hearings, p. 88.

[6]**1bid.**

[7]**See** pp. 49-52, **99,** and 103 of this report for detailed summaries of all suggestions made to OTA in the course of the study. These suggestions helped frame options for congressional action.

[8]Detailed descriptions of these key agencies can be found in the hearing testimony as follows: Regarding FAS, pp. 104-107, 120-123; Regarding ERS, pp. 107-120, 123-130; Analysis of FAS and ERS, pp. 81-97.

[9]"Scope and Methods of the Statistical Reporting Service," USDA, Miscellaneous Publication No. 1308, July 1975, provides valuable insights into this USDA agency.

[10]Hearings, pp. 90, 92, and 121.

[11]Hearings, pp. 120-123.

[12]Hearings, p. 120.

[13]Hearings, p. 88.

[14]ibid.

I shearings, p. 91.

[16]Hearings, p. 170.

[17]Hearings, p. 89.

113A report to the Congress entitled "The Agricultural Attache Role Overseas: What He Does and How He Can Be More Effective for the United States," prepared by the Comptroller General of the United States, April 11, 1975. provides more detailed resource material than the OTA study or hearing record.

[19]The Central Intelligence Agency feels that major communications barriers with USDA have been overcome since 1973. Institutional barriers still remain—namely, economic and food intelligence information reaches only the top-level USDA decisionmakers. This inform@ ion is held rather tightly, The information that passes to the working-level analyst is well filtered, Not all senior analysts in ERS are cleared to receive it. Likewise, what flows to Congress undergoes more sanitation via USDA.

Two lines of inquiry were not pursued by OTA: (1) the accuracy of CIA information and its frequency, quality, and flow within USDA; and (2) how Congress might obtain access to CIA intelligence data on a regular basis.

[20]Hearings, pp. 45, 114, and 125.

[21]Hearings, p, 230. A paper prepared at OTA's request by Mr. E.A. Jaenke, President of E.A. Jaenke & Associates, Inc., enumerated the major agencies, departments, and government bodies that have some significant input in the total food equation. These decisionmakers number 26 and are listed as appendix 111 along with an executive office organization chart. See also, Hearings. pp. 173-178.

[22]Detailed statistics and numbers on circulation can be found in Hearings, p. 120.

23 Hearings, pp. 92, 124-125.

[24]Hearings, p. 124.

[25]Hearings, p. 124. Refers to the Office of Technology Assessment Food Advisory Committee Report, p. 40.

[26]Hearings, p. 92.

[27]*Ibid.*

[28]Agricultural Research Service, Agricultural Marketing Service, Hearings, pp. 16 and 18.

[29]The OTA study found more consistent praise for SRS than for any other element in USDA's information network. (Hearings. p. 94.) Another notice of high praise is found in a comment by Dr. Hosea Harkness, who, commenting on some of the USDA organizations playing key roles, felt that the SRS "is the most sophisticated agricultural data collection service in the world. Reports are released with a timeliness that exists nowhere else. Quality of the forecasts and estimates are unsurpassed." (Hearings, p. 133.)

shearings, p. 167.

[31] Hearings, p. 41.

shearings, p. 41.

[33]"The Soviet Grain Shortage: A Case of Rising Expectation," Current History, June 1975, p. 246.

[34]Hearings, p. 75.

[36]Hearings, p. 76.

[37]Hearings, p. 6.

[37]Hearings, p. 144.

[38]Hearings. P. 43.

[39] Hearings, pp. 43-44.

[40]A copy of the treaty appears in Hearings, pp. 61-70. Assistant Secretary Bell noted that the United States has similar cooperative agreements with Eastern Europe Communist countries to fill knowledge gaps. These include Poland and Roman ia; with East Germany a serious gap remains. (Hearings. pp. **46-47.)**

[41]Hearings, p. 56. Refer to treaty document pp. 65–66 for a list of categories.

[42]Hearings, p. 56.

[43]Hearings, p. 56. A later witness, Professor Luther Tweeten, said: "The Soviet Union itself seems to lack adequate data on commodity production and utilization. In part this stems from failure of its statistical reporting system, which can be improved. But in part the inadequate data stems from changes in production late in the crop season including failure to harvest grain in the fields because of inclement weather. (Hearings, p. 222.)

[44]Hearings, p. 38.

[45]Hearings, p. 56.

[46]Hearings, p. 38.

[47]Hearings, p. 339.

[48]*Ibid.* Seth and Cochrane urged the "U.S. Government to press for full cooperation in the furnishing of information on production, use, and stockpiling of food commodities, especially grain. Investment by the United States in improving the fundamental data base both home and abroad for projecting commodity requirements would pay a high return in terms of reducing surprise. uncertain t y. and speculative price gyration s." (Hearings< p. 197.)

[49]Hearings, p. 44.

[50]Hearings, p. 57

[51] Hearings, p. 57

[52]Hearings, p. 269.

[53]*Ibid.*

[54]Hearings, p. 269.

Shearings, p. 57.

[56]Hearings, p. 9.

[57]Hearings, p. 122. See also earlier discussion on agricultural attachés in this summary, pp. 7–10.

[58]Hearings, p. 123.

shearings, p. 124.

[60]Hearings, p. 124.

[61]Hearings, p. 124.

[62] Hearings, pp. 124-125.

[63] Hearings, pp. 125-126.

[64] Hearings, p. 126.

[65] Hearings, p. 127.

[66]*Ibid.*

[67]Hearings, p. 133.

[68]Hearings, p. 130.

[69]Hearings, p. 137.

[70]Hearings, p. 138.

71 Hearings, p. 138-139.

[72]*Ibid.*

[73]Hearings, p. 144.

[74]Hearings, p. 139.

[75]Hearings, p. 140.

[76] Hearings, p. 147.

77 Hearings, p. 148-150; 159,160.

[78]Hearings, p. 154.

[79] Marketing margin: the difference between what the farmer gets for his raw product and what the consumer pays at retail for the finished product.

[80]Hearings, p. 148.

[81] Hearings, pp. 149-150.

[82] Hearings, pp- 151-153.

[83] Hearings, p. 150.

[84]Deficiencies were noted by all OTA participants and were acknowledged by USDA. Mr. Howard Hjort's testimony and analysis provided useful categories upon which to base this summary. (Hearings, pp. 92-95.)

[85] Noted by FAC report, pp. 25-26; by Assistant Secretary Bell, pp. 37 and 42; by Dr. Hathaway, p. 70; Mr. Jaenke, pp. 170 and 186; Dr. Cochrane and Mr. Seth, p. 197. (All page numbers refer to Hearings.)

[86]Noted by FAC report, pp. 19-22; Dr. Hathaway, p. 75; Mr. Sjerven, p. 137; Mr. Johnson, pp. 147-148; Mr. Hamilton, p. 156; Mr. Jaenke, p. 186. (All page numbers refer to hearings.)

[87]Noted by FAC report, pp. 14, 22-24; Dr. Hathaway, pp. 78-79; Mr. Hume, p. 123; Dr. West, pp. 124-125; Mr. Hamilton, p. 154; Mr. Jaenke, p. 186. (All page numbers refer to Hearings,)

[88] Noted by FAC report, pp. 23-24; Mr. Harkness, p. 134; Mr. Sjerven, p. 138; Mr. Keefe, pp. 143-144; Mr. Hamilton, Hearings, p. 155; Mr. Jaenke, p. 186. (All page numbers refer to hearings.)

[89] Hearings, p. 76.

[90]Hearings, p. 26.

[91]Hearings, p. 197.

[92]Hearings, p. 118.

[93] Hearings, p. 156. For FAC discussion on broiler prices, see Hearings, pp. 19-20.

[94]Hearings, pp. 126-127.

95Hearings, p. 118.
96Hearings, pp. 19-20.
97Hearings, p. 102.
98Hearings, p. 93.
99Hearings, p. 123.
100Hearings, pp. 124-125.
10 I Hearings, p. 146.
102*Ibid.*
103Hearings, p. 93.
104Hearings, pp. 201-202.
105Hearings, p. 95.
10 6Hearings, p. 95.
107Hearings, pp. 143-144.
106 Headings, pp. 93-95.
109Hearings, pp. 93-94.
110Hearings, p. 94.
111Such a measure was supported by Seth and Cochrane (Hearings, pp. 201-202). See also their comments pp. 192-193.
112Hearings, p. 94.
113Hearings, p. 134.
114Frazier, Hearings, p. 149; and Hjort, Hearings, p. 85.
115USDA opposed such a Board. See testimony by Hume, Hearings, p. 112.
116Hearings, p. 134.
117Hearings, p. 112.
118Hearings, p. 113.
119Hearings, p. 202. See also p. 193.
120 Hearings, p. 95.
121 Hearings, p. 95.
122Hjort, Hearings, p. 95.
123Hearings, p. 202.
124Food Advisory Committee report, Hearings, p. 19.
125Hearings, p. 20.
126Detailed discussion, pro and con, of this topic is found in Hearings, pp. 356-392.
127Hearings, p. 21.
128Hearings, p. 356.
129Hearings, p. 373.
130*Ibid.*
131 Hearings, pp. 387-389.
132Hearings, p. 222.
133Hearings, p. 118.
134 Hearings, pp. 102-103. See also p. 119.
135 Hearings, p. 103.
136 Hearings, p. 119.
137The material for this section was developed by OTA staff for use in the Food Advisory Committee report. See Hearings, pp. 29-33.
138Derived from staff bill analysis found on pp. 106-107 of this summary and analysis.
139Hearings, p. 126.
140Hearings, pp. 126-127.
141*Milling* & Baking News, October 7, 1975, as cited in Hearings, p. 137.
142Hearings, p. 137.
143Hearings, p. 138.
144 Hearings, p. 24.
145 Hearings, p. 26.
146 Much of this discussion was laced with the technical aspects of remote sensing. This summary and analysis has attempted to distill the policy issues from the presentations and discussions of witnesses. The interested reader may refer to the Hearings, pp. 243-336, to review these technical matters.
147 METSAT and DATASAT were intended to acquire operational data to meet the needs of the organizational entities responsible for their design and employment.

METSATS (see Hearings. pp. 318-320) are the NOAA–3 and –4 satellites of the Department of Defense.

DATASATs (see Hearings, pp. 320-322) are the COMSAT/INTELSAT Communications Satellites and the DOMSAT series.

However, both systems may have utility for an agricultural information system —i. e., METSATS, weather and precipitation data; and DATASATs, a telemetry channel for data transmission.
148 Hearings, p. 249.
149 Hearings, pp. 249, 277, 314-315.
150 Hearings, p. 299.
151 Hearings, p. 253.
152 *Ibid.*
153 Hearings, p. 255.
154 Hearings, p. 40.
155 Hearings, p. 45.
156 Hearings, p. 123.
157 The reader may obtain technical background from Mr. Matthews' statement concerning LACIE in Hearings, pp. 250-253, and from Dr. Park's statement in Hearings, pp. 312-318.
158 Hearings, pp. 298-299.
159 Hearings, pp. 299-301.
160 Hearings, p. 253,
161 Hearings, p. 273.
162 Hearings, p. 293.
163 Hearings, p. 293.
164 Hearings, p. 299.
165 Hearings, p, 311.
166 Hearings, pp. 316-317.
167 Hearings, p. 317.
168 Hearings, p. 316.
169 Hearings, p. 249.
170 *Ibid.*
171 *Ibid.*
172 Land *Satellite Project, National* Aeronautics and Space Administration. Study by the staff of the U.S. General Accounting Office, January 30, 1976, Publication No. PSAD-76-74, (GAO report), pp. 1–2.
173 GAO report, pp. 2, 18, 31.
174 GAO report, p. 3.
175 Hearings, p. 335.
176 Hearings, p. 327.

Chapter 3

THE FAO SYSTEM: DEFICIENCIES AND OPTIONS FOR IMPROVEMENT

'l'he Food and Agriculture Organization of the United Nations (FAO) is the major source of information on world agriculture. z Thus, any expectations for making improvements to the world's food information system must review the FAO, examine its deficiencies, and consider ways to improve its operation. Figure 17 shows the proposed organizational structure of the UN's Food and Agriculture Organization.

FAO performs for the United Nations about the same functions that the Department of Agriculture performs for the U.S. Governments Headquartered in Rome, FAO has statistical and research divisions as well as numerous field offices scattered about the world, from which it collects data and gives advice, FAO's main agricultural publications are its annual Yearbook of Agricultural Production, Yearbook of Agricultural Trade, commodities reviews, and State of Food and Agriculture.

The latter provides food balance sheets and indices of agricultural production by region and country. However, these statistics are generally 1 year to 18 months old and thus do not meet the criterion of timeliness. In addition, the FAO publishes a Monthly Bulletin of Agricultural Economics and Statistics and every 10 years conducts a world food survey. The Monthly Bulletin on Statistics, the early warning systems, and commodity publications provide more current data, especially in recent years on particular commodities and commodity groups.

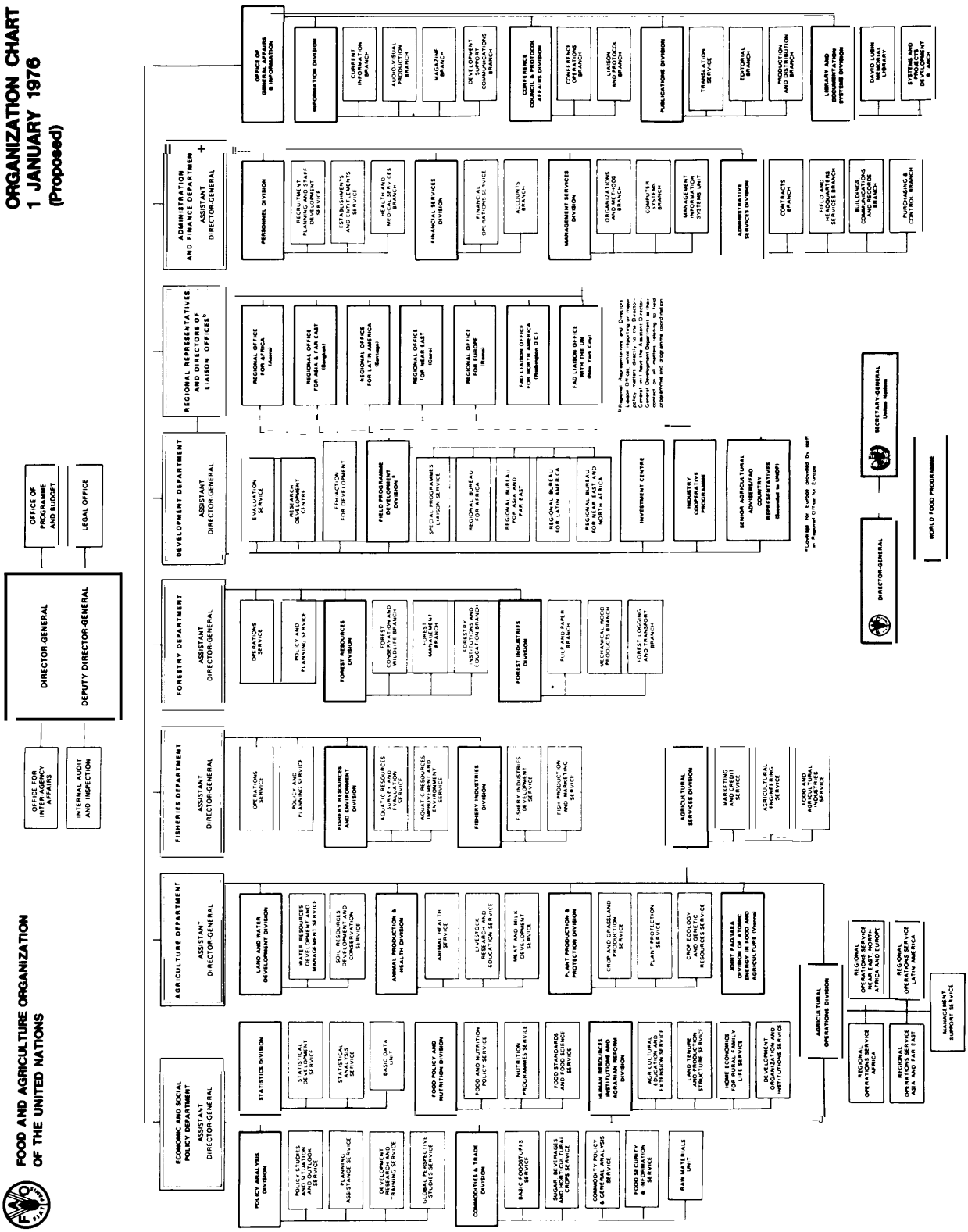
Recognizing the lack of timeliness in most of its data series, FAO began the development of an early warning system in 1968. Under this system, monthly reports on food crop conditions and the food situation are collected by FAO and the World Food Program staff for over 70 developing countries. This early warning program is aimed at obtaining advance indications of possible needs for emergency food aid. These early warning reports are in addition to current and prospective crop estimates collected regularly as a part of an FAO market intelligence service, which has been functioning for many years.

1 The OTA study did not explore the FAO system in detail since such an analysis has been the subject of intense study culminating in the 1974 World Food Conference resolution. (See Hearings, pp. 33-36.) Thus, this summary is not on the same level as the analysis of USDA resources. Attention is called to The United States, *FAO* and World Food Politics: U.S. Relations with an International Food Organization, a staff report prepared for the Senate Select Committee on Nutrition and Human Needs, United States Senate (June 1976) which provides an excellent discussion of FAO and the U.S. role in this international organization.

2 The International Wheat Council (IWC) is also a valuable source of information in the international arena. Located in London, with 10 exporting members and 42 importing members, the IWC began issuing monthly and annual reports on the world wheat supply and demand situation in 1972. These reports are issued on a timely basis and appear to be comprehensive. The Union of Soviet Socialist Republics, although not a member of the FAO, is a cooperating member of IWC.

3 Hathaway's presentation provides background and detail for this summary (pp. 70-85); additional sources: FAC (p. 18; pp. 24-28; pp. 33-36); Hjort (pp. 86-90). (All page numbers refer to Hearings.)

Figure 17.—Proposed structure of the United Nations Food and Agriculture Organization, January 1976.



The 1973 FAO conference authorized funds for an expansion of the early warning system: and an expanded program was established in March 1974. The new food information system represents a step forward in providing greater emphasis on' a more coordinated and timely approach.

This early warning food information system, staffed by the FAO and the World Food Program, provides the most timely information available during the crop-growing season for about 70 developing countries. The FAO collects similar crop progress information on commodities in the developed countries.

The World Food Conference in November 1974 adopted resolutions calling for further improvement in the early warning food information system. q

As a followup to the 1974 World Food Conference, FAO is developing timely information during the growing and early harvest season for all countries on a regional and world basis. Figure 18 lists the member countries of the FAO.

Each year for the past 10 years or more, the" FAO has stationed 25 to 40 technically trained experts in underdeveloped countries for the purpose of helping the national governments improve their statistical services. The technically trained FAO staff member is usually stationed in a country for a full year or more to enable him to train local personnel in the collection and dissemination of agricultural information.

FAO cooperates with national governments in the experimental use of aerial photography to collect more accurate and timely information on crops and livestock numbers. Its staff is also studying the feasibility of remote sensing as a means of obtaining agricultural data in countries where gaps now exist.

The field staff of the FAO and the World Food Program prepare qualitative reports on the weather as it has affected crop production in the country for which they are making early warning reports.

STATUS AND PLANS OF FAO FOR ITS GLOBAL INFORMATION AND EARLY WARNING SYSTEM

The new FAO food information system has four basic types of output:

1. the food situation and outlook series;
2. an early warning of food shortages;
3. information on food stocks and food aid; and
4. fertilizer and pesticide information.

The food situation and outlook series now consists of monthly, quarterly, and ad hoc reports, They cover the food supply-demand outlook in light of changes in production 'prospects, prices, policies, sales, stocks, and the availability and prices of such key inputs as fertilizer, pesticides, and shipping.

Early warning of food shortages as provided by monthly summaries of the latest information on crop conditions, weather, plant diseases, and food deficiencies and availabilities in some 90 countries is published in Foodcrops and Shortages. This contains largely qualitative estimates of conditions—including a rating scale of crop conditions, planting, progress of harvest, and rainfall—plus comments or observations from FAO representatives, project specialists, World Food Program officers, and other sources.

The most valuable attribute of this portion of the system is its timeliness. The reporting of adverse weather conditions, natural disasters, and other events that may affect crop availabilities and demands is a great aid to

[4] See FAC report for discussion and Resolution XVI, pp. 33-36; and Hathaway, p. 75.

Figure 18.—Members of the United Nations Food and Agriculture Organization.

Afghanistan
Albania
Algeria
Argentina
Australia
Austria
Bahamas
Bahrain
Bangladesh
Barbados
Belgium
Bolivia
Botswana
Brazil
Bulgaria
Burma
Burundi
Cameroon
Canada
Cape Verde Islands
Central African Republic
Chad
Chile
China
Colombia
Congo
Gabon
Gambia, The
Germany (Fed. Rep. of)
Ghana
Costa Rica
Cuba
Cyprus
Czechoslovakia
Dahomey
Denmark
Dominican Republic
Ecuador
Egypt
El Salvador
Ethiopia
Fiji
Finland
France
Greece
Grenada
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
Hungary
Iceland
India
Indonesia
Iran
Iraq
Ireland
Israel
Italy
Ivory Coast
Jamaica
Japan
Jordan
Kenya
Khmer Republic
Korea (Republic of)
Kuwait
Laos
Lebanon
Lesotho
Liberia
Libyan Arab Republic
Luxembourg
Madagascar
Malawi
Malaysia
Maldives
Mali
Malta
Mauritania
Mauritius
Mexico
Mongolian People's Rep.
Morocco
Nepal
Netherlands
New Zealand
Nicaragua
Niger
Nigeria
Norway
Oman
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Romania
Rwanda
Saudi Arabia
Senegal
Sierra Leone
Somalia
Spain
Sri Lanka
Sudan
Surinam
Swaziland
Sweden
Switzerland
Syrian Arab Republic
Tanzania
Thailand
Togo
Trinidad and Tobago
Tunisia
Turkey
Uganda
United Arab Emirates
United Kingdom
United States of America
Upper Volta
Uruguay
Venezuela
Viet-Nam (Republic of)
Yemen Arab Republic
Yemen (People's Dem. Rep. of)
Yugoslavia
Zaire
Zambia

those who must make rapid policy decisions in advance of the final quantitative estimates,

The adequacy of information available in this part of the system varies greatly from country to country. Defects are due partly to a lack of an adequate support system and in some cases to a lack of country cooperation.

In the case of the early warning system, quantitative accuracy is almost impossible by definition. The relationships between weather

and the appearance of insects and diseases are not yet well quantified, nor is a direct and stable relationship likely to be found in the near future. Thus, the qualitative estimates now used are probably as good as can be devised given the state of knowledge regarding these relationships,

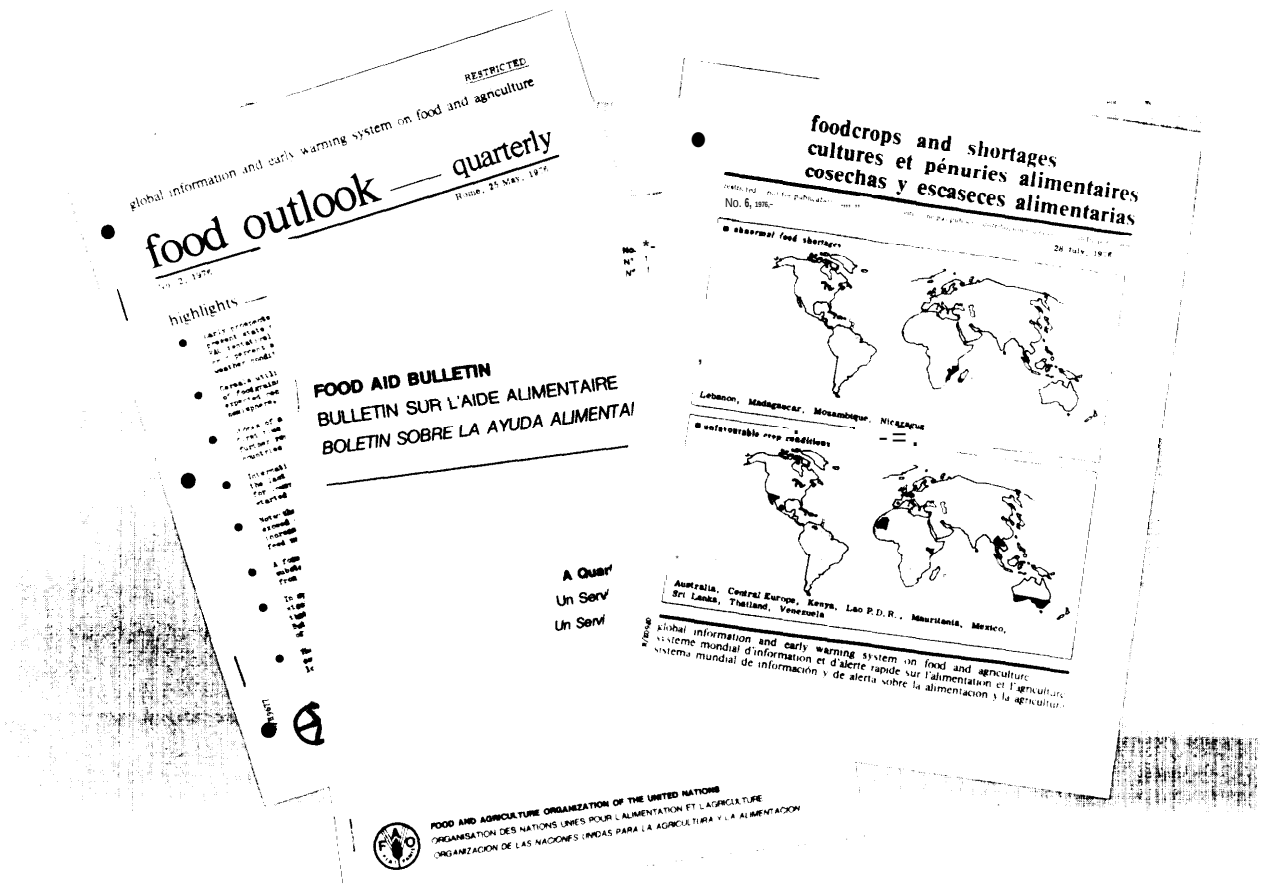
Information on food stocks and food aid is provided by reports entitled "World Food Stocks: Status and Evaluation, " authorized by the FAO Conference in 1973. They include assessment of national stock targets and policies and the adequacy of world cereal stocks in the context of world food security.

The FAO Food Aid Bulletin, (figure 19), issued quarterly since July 1970, provides information on bilateral and multilateral food aid transactions and food aid availabilities based on notifications made by governments to FAO and on data especially provided by international agencies concerned.

The FAO Food Aid Bulletin, issued quarterly since July 1970, provides information on bilateral and multilateral food aid transactions and food aid availabilities based on notifications made by governments to FAO and on data especially provided by interna - tional agencies concerned.

The FAO fertilizer and pesticide information is an off-shoot of their newly established International Fertilizer Supply Scheme. Information on supplies, deficits, prices, contracts, and capacities are monitored for the purposes of emergency operations under the scheme. A new quarterly fertilizer survey and other information-gathering activities have been initiated, and steps are being taken to develop a similar information. system on pesticides.

Figure 19.—Publications of the Food and Agriculture Organization



DEFICIENCIES

Most of the problems and deficiencies are those encountered in any attempt at collection and dissemination of data from a large number of governments with diverse information-assembling capabilities and dissemination policies. These deficiencies can also be attributed in part to the limitations on FAO action inherent in an international or intergovernmental organization.

After discussing the excellent data provided on wheat by the International Wheat Council, s Assistant Secretary Bell said: "When it comes to the other commodities, like rice and coarse grain and meat, we do not have that effective a system."[6] He indicated that information from other international bodies on such commodities is made available from the FAO in Rome, He said, however, that this information "tends to be less prompt and ., .is not, in my judgment, as accurate and as useful as the information coming out of the International Wheat Council--or as up-to-date as the information from the International Wheat Council."[7] (See figure 20.)

The new FAO data series will attempt to solve the timeliness problem, but there will still be gaps in adequacy and accuracy. In terms of the range of information covered, the adequacy is excellent. Its inadequacy in terms of world coverage lies in the fact that the Union of Soviet Socialist Republics is not a member of FAO and has thus far cooperated no more with FAO than with others regarding this information. The People's Republic of China, although a member of FAO, has not yet seen fit to provide the information requested for the system. Thus, the FAO food information system, in common with other systems generally available to most governments, is totally inadequate in coverage of two of the world's largest agricultural producers and consumers.

The problem of accuracy is twofold, The first and most significant problem is the sheer inability of developing countries to produce accurate information with present indigenous technology. The difficulties encountered in producing reasonably accurate estimates in developing countries are enormous.

Figure 20.—Members of the international Wheat Council

EXPORTING MEMBERS

- Argentina
- Australia
- Canada
- European Economic Community
- Greece
- Kenya
- Spain
- Sweden
- Union of Soviet Socialist Republics
- United States of America

IMPORTING MEMBERS

- Algeria
- Austria
- Barbados
- Bolivia
- Brazil
- Costa Rica
- Cuba
- Dominican Republic
- Ecuador
- Egypt (Arab Rep. of)
- El Salvador
- European Economic Community
- Finland
- Guatemala
- India
- Iran
- Iraq
- Israel
- Japan
- Lebanon
- Libyan Arab Republic
- Malta
- Mauritius
- Morocco
- Nigeria
- Norway
- Pakistan
- Panama
- Peru
- Portugal
- Republic of Korea
- Saudi Arabia
- South Africa
- Switzerland
- Syrian Arab Republic
- Trinidad and Tobago
- Tunisia
- United Kingdom
- Vatican City
- Venezuela

[5] Hearings, p. 41.
[6] Hearings, p. 42.
[7] *Ibid.*

Another accuracy problem arises because some countries simply do not want to admit that their agricultural economy is performing badly; and they either do not report or report belatedly the facts about their agricultural production. This, too, reduces the accuracy of world food information. a

In the area of key inputs, fertilizers, and pesticides, the information is neither timely, nor accurate, nor adequate. The reasons for this vary. First, the production and distribution of these products are carried on by a mix of private and public enterprises, sometimes within the same country, Some countries, for their own reasons, do not divulge their most recent statistics on current status of plans, even though they presumably have them, The private firms involved often are reluctant to disclose information which they believe may affect their competitive position. All in all, the situation is totally unsatisfactory in both current estimates and forecasts and the problem of accurate information an exceedingly difficult one.

As an illustration, in the months just prior to the World Food Conference in 1974, a series of estimates on world fertilizer production, use, availability, and potential capacity in the short- and long-run were prepared by several national and international organizations. They varied widely in several aspects and changed markedly during a short period of time. The situation regarding pesticides appeared equally confusing.

By action of FAO member governments, the FAO information system is a closed system—i.e., certain of the materials it provides are limited in distribution only to participating countries and cooperating international organizations for their exclusive use. This includes the monthly Food Situation Reports, the reports on crop conditions and food situations by countries, and the special reports. The Food Quarterly Outlook is distributed to participating governments, to nonparticipating governments that are members of FAO, and to cooperating international organizations.

Thus, the FAO food information system is not available to the general public and the media. This condition was imposed by some member governments which believe that disclosure of such information would give an advantage to private traders and speculators,

In the area of analysis, FAO faces a problem created by the nature of its organization. The reporting of facts is a much less sensitive area than the analysis of what actions need to be taken and by whom, Here the FAO runs head on into sensitivities that go with national sovereignty. It is one thing to point out that there is a serious gap between available food and the needs of the **most seriously affected** nations and another to suggest to the U.S. Government or to the European Economic Community that they need to do more in providing food aid. It is acceptable for one nation to publicly question another's policy, but it is not acceptable for the staff of an international organization composed of member nations to do so.

Some believe it is expecting too much of the FAO to provide policy analysis which is explicitly critical of national policies. This means that policy analysis must rest with national governments and organizations outside the formal United Nations framework. This, of course, means that a substantial imbalance occurs between nations,

Many developing nations have neither the trained manpower nor the resources for such analysis, nor do they always accept analysis done by other governments.

FAO and other international agencies also encounter the problem of unwillingness on the parts of national governments to release unbiased data when they fear problems with an important segment of their citizenry, For example, national governments have been reluc-

B Hearings, pp. 74-75.

tant to release their best estimates of national crop production in a drought year. Rather, the government releases the estimates it believes best suited to its political purposes. FAO and other international agencies, as well as USDA, have no practical alternative to accepting the data supplied by the national governments. This is a potential source of weakness in all data gathered and released by international organizations and a serious hardship to all who use the data,

Although the early warning reports of FAO have been helpful in providing information at an early date on food crop conditions in countries with potential requirements for emergency food aid, the reports have been in qualitative terms, They have seldom contained quantitative estimates and have seldom been sufficiently documented to provide a basis for estimating the food import requirements of the countries.

Serious political problems in the collection and release of remote-sensing data, as well as the high cost of processing them, make it unlikely that remote sensing will close existing information gaps in the near future.

Other deficiencies in the information collected and published by the FAO are recognized.

The elapsed time between the collection of data in the various countries and its availability in FAO publications is so great that most series are of value only for historical research. The information reported in the monthly bulletins of economics and statistics is more timely than that published in the annual yearbooks; yet even in these publications there is usually a lag of 6 months or more between the collection of the country data and the availability y of the regional and world summaries in the monthly bulletins.

Another deficiency, noted earlier, is the gap in the world food and agriculture information created by the failure of the Union of Soviet Socialist Republics to provide adequate and timely national agricultural data, In addition, little information on either acreage or production is made available by the People's Republic of China.

The inadequacies of the food and agriculture information systems in the developing countries create serious problems for U.S. analysts and for the international agencies that assemble world food and agricultural statistics. The United States has made an important contribution to the information systems of developing countries in the past by its Agency for International Development (AID) financed technical assistance activities.[9] However, AID no longer provides adequate funds to continue these efforts, Indeed, OTA's study found that inadequate attention is now being given to this in AID,

OTA's study stressed the importance of strengthening FAO food information activities as much as possible, while it recognized that FAO will find it difficult to achieve the goals it has set for itself in the next few years. The United States can be of substantial assistance to the FAO as it struggles to meet these goals, by providing increased technical and financial assistance for FAO informational activities.

[9] Hearings, pp. 413-414.

SUGGESTED IMPROVEMENTS

Several suggestions were made as to how the FAO information system might be improved. These suggestions focused on the role of the U.S. in this system. These suggestions and a discussion follow.

Expanding U.S. role in a world information system

1. The USDA should combine world food intelligence with U.S. situation and outlook in food and agriculture. (Hjort, Hearings, p. 90.)

2. The USDA should adapt to changes in world food situation with appropriate staff, organization, and budget changes. (Keefe, Hearings, p. 1 44.)

3. U.S. agricultural attaches should provide more precise data and information on the use of land, agricultural inputs, human and animal populations, income, prices, and other supply and demand factors, so that analysts covering the world situation and outlook are in a better position to assess these factors. They should develop more reliable supply-demand estimates and report more fully and frequently on the world food and agriculture situation and outlook. (Hjort, Hearings, p. 93.)

4. The United States should provide increased financial and technical assistance to the world information institution of the FAO. (FAC Report, Hearings, pp. 33-36.)

5. The U.S. Congress should direct AID to increase its technical assistance for the improvement of agricultural information systems, including the introduction of advanced information technology, in developing countries most deficient in their agricultural statistical institutions. (FAC Report, Hearings, pp. 33-36.)

6. The U.S. Government should convince other governments to freely provide FAO with the information this global institution needs. (Hathaway, Hearings, p. 70.)

Opinions differ as to the availability of current production and information on forward estimates in the centrally planned countries. If the information does exist, it is not shared. With improved technologies for data collection, analysis, and transmission, existing deficiencies in current production information and forward estimates can be corrected within the next few years if a country desires. The world food information system would be improved significantly if the centrally planned countries would supply the FAO and major exporting countries with timely production information and forward estimates of requirements. The United States can play a constructive role in encouraging these countries to develop such data as a part of its trading relationships with them. It also might provide technical assistance to them on request.

Options for Strengthening the U.S. Role

There are several options for Congress to strengthen the U.S. role in world food information systems. Congress could insist that the executive branch, in its trading relations with centrally planned countries, take a more positive role regarding the need for those countries to supply the outside world with timely national food information. This issue was not dealt with in the 1975 long-term

grain sales agreement the U.S. concluded with the Union of the Soviet Socialist Republics. Congress could ask the executive branch to insist on timely release of national food information as a part of any future commercial trading relations with the United States.

A second option would be for Congress to take a more positive role toward increasing the scope and quality of the data collected in developing countries and increasing the analytic capabilities of the U.S. staffs that prepare reports on international food production, stocks, and prices. These actions would primarily benefit the United States, but since this country makes all published information generally available, other countries would benefit from better world information on which to base their food policies.

Another option would be to focus increased congressional attention on the activities and needs of the FAO. This could be achieved by conducting congressional oversight hearings on the cooperation between U.S. technical staffs and those of the FAO.

Still another option would be for Congress to make additional funds available to AID for financing technical assistance on food information problems in developing countries.

To date, "AID has not given special policy emphasis to technical assistance for the establishment or strengthening of crop reporting systems (in developing countries). "lo Since AID does not now give this a high priority. [11] **Congress could** ask AID to develop a comprehensive, well-coordinated program to assure that funds are properly allocated.

If Congress wished to take an even more active role in improving world food information systems, it might make additional funds available for FAO information activities and urge" other countries to take similar actions. The United States now contributes approximately 25 percent of the total FAO budget, approximately $20 million annually Only a small part is used for information activities.

Although some members of Congress believe that the United States is already contributing more than it should to the FAO, if it wishes to take the leadership in increasing FAO's informational activities, increased expenditures on the order of several hundred thousand dollars might be required.

With the exception of Congresswoman Holt,[12] all comments[13] supported the recommendation made by the FAC report suggesting an increased role for the United States as well as increased funds for technical assistance.

We believe that the Department's role in AID funded technical assistance has been very productive. This type of direct assistance is probably the best way to improve statistics in countries eligible for AID funds.[14]

10 Hearings, p. 413.

11 persona] communication dated June 3, 1976, from John E, Murphy, acting administrator, AID, to Senator Hubert H. Humphrey.

12 Hearings, pp. 98-99.

13 Paarlberg, p. 103; Hathaway, p. 70; Hjort, p. 96; Abel, pp. 339-340. (All page numbers refer to Hearings.)

14 Dr. Don Paarlberg, Hearings, p. 119.

Chapter 4

THE CAPACITY OF CONGRESS TO ANALYZE FOOD ISSUES

INTRODUCTION

During the course of this OTA study, comments were made regarding the need for Congress to improve its capabilities to analyze current and emerging food issues and to review proposed legislation in the food, agriculture, and nutrition area. These suggestions were:

1. Congress should increase the analytical capabilities of the staffs of its agricultural committees and of the agricultural specialists in the Congressional Research Service. A group of several competent analysts capable of making its own studies should be available to Congress. (FAC report, Hearings, pp. 12-1 4.)

2. The increased analytical capabilities of Congress should be used primarily to analyze information produced by research and statistical agencies, such as the Economic Research Service of USDA and the land-grant universities. (Hamilton, Hearings, p. 154.)

3. Congress should develop closer liaison with the executive agencies and the land-grant universities, requesting them to devote more of their analytical capabilities to the analysis of information for Congress. (FAC report, Hearings, p. 7.)

The thrust of these suggestions and, the consensus of discussion with OTA'S Food Advisory **Committee and witnesses was** that increased analytical capability **need not** imply additional staff.

Congress has increased its staff substantially in recent years. The Legislative Reorganization Act of 1970 primarily authorized an expansion in the Congressional Research Service and the General Accounting Office. House Resolution 998—the Boiling committee reform amendments, approved in 1974—realigned House committee responsibilities and authorized some additional committee staff. The Congressional Budget and Impoundment Act-Public Law 93-344, approved in 1974-also authorized and required additional staff.

Even though congressional staffs, including those of the agencies serving Congress—the General Accounting Office, Congressional Research Service, Office of Technology Assessment, and the Congressional Budget Office-have increased over 60 percent in the past 4 years, they are small in relation to the

workload of Congress. Congressional staffs also are very small in any specific area in relation to the size of similar staffs in executive agencies or universities.

In the area of food, agriculture, and nutrition, members and staff of the 93rd Congress dealt with 330 bills and resolutions in the Senate and with 1,501 similar items in the House of Representatives. Although the second session of the 94th Congress may not end until the close of the calendar year 1976, by April 19, 1976, congressional staff had dealt with 325 Senate and 1,400 House bills and resolutions in the area of food, agriculture, and nutrition.

Although all bills and resolutions which deal primarily with agriculture and nutrition are referred to the agriculture committees of the Senate and the House, 17 different committees in the Senate and 20 different committees in the House considered bills or resolutions dealing with food, agriculture, and[or nutrition in the 93rd and 94th Congresses. The number of items referred to each committee is shown in table 3.

The Senate Select Committee on Nutrition and Human Needs and the Joint Economic Committee also spend considerable time and effort on problems in food, agriculture, and nutrition but do not have any bills or resolutions referred to them for action, since they do not have legislative responsibilities. Also, different procedures for introducing items in the House and Senate affect the numbers recorded. In the House a member may reintroduce an item several times as cosponsors are added. In the Senate, cosponsors are added to the original bill or resolution rather than reintroducing the item with cosponsors. A further indication of the activities of Congress in the area of food, agriculture, and nutrition is the number of bills and resolutions on which hearings were held and related actions taken. These are shown in table 4.

It is of interest to note that only 26 of the 330 items introduced in the Senate and 34 of the 1,501 items introduced in the House in the 93rd Congress were enacted by the Congress and approved by the President.

SCREENING AND EVALUATION OF INFORMATION FOR CONGRESS

Although members of Congress or their staffs seldom have all the information they would like to have on a particular issue, Congress does not suffer from a lack of information. Rather, member and committee offices are almost overwhelmed by the volume of reports, news items, letters, and telephone calls coming into their offices each day.

The screening of this massive flow of information is an enormous job. Members of Congress and their staffs, who have had little experience in the fields of food, agriculture, and nutrition, have little basis for judging the quality of the information coming from the different sources. Many students of the problem believe that the critical need in this area is neither more information nor more staff but more analytical capability.

Members of Congress and congressional committees depend primarily on the Congressional Research Service to supplement their staffs in supplying analytical evaluated information. The Congressional Research Service, with its automatic data-processing facilities and other research resources, is the only agency which has as its primary goal, on a continuing basis, the organization of information specifically to meet the day-to-day requests of members and committees of Congress. It maintains a corps of analysts in most subject matter fields and stands ready to respond as promptly as their own staffs to requests by members of committees of Congress.

In recent years the increasing amounts of information and **analyses most commonly requested have been accumulated in computer data banks and are available on a moment's notice.**

Members of Congress, congressional committees, and subcommittees dealing with food, agriculture, and nutrition issues also call on the USDA Economic Research Service and to a lesser extent on other government agencies for analytical reports. Professors at the land-grant universities are another important source of evaluated information on food policy issues.

The Government Accounting Office, which in earlier years was primarily engaged in auditing the administration of Government programs, more recently has responded to congressional requests for analysis of current or emerging issues of concern to members of Congress.

Two congressional staff agencies that provide additional analytical capability for the Congress were very recently created. These are the Office of Technology Assessment and the Congressional Budget-Office.

The Office of Technology Assessment responds to requests from committee chairmen and ranking minority members for indepth studies and assessments that require more resources than are available in the Congressional Research Service.

The Congressional Budget Office, now in its second year, has developed a modest analytical staff that is fully occupied with issues closely related to the new budget responsibilities of Congress.

IMPROVING THE CAPACITY OF CONGRESS TO ANALYZE FOOD ISSUES

After surveying both the flows of information and the analytical capabilities of the congressional staffs and those of the research agencies serving Congress, Food Advisory Committee members and witnesses at the hearings concluded that the greatest congressional needs at this time are more analytical services and capabilities for dealing with the burgeoning information flow on the rapidly changing situation involving food, agriculture, and nutrition. '

[1] Hearings, pp. 12-14.

The Food Advisory Committee suggested strengthening the analytic capabilities of the major congressional committees dealing with food, agriculture, and nutrition. They also suggested that a group of several competent analysts capable of making its own studies should be available to the Congress. This group of analysts might be located in a single agency such as the Congressional Research Service, or it might be made up of analysts complementary to one another from several congressional committees and staff agencies.

As pointed out by one witness, congressional action to improve its own staff capability should not be limited to increasing the number of professional staff members. Attention should also be given to how to make professional staff resources more aware of and more responsive to the needs of Congress.

Improved communication and coordination of activities among the Congressional Research Service, Office of Technology Assessment, General Accounting Office, Congressional Budget Office, and the staffs of the agriculture and nutrition committees could eliminate unnecessary duplication of the various staffs on the important issues that confront the Congress.

Witnesses indicated that the increased analytical capabilities needed by Congress in the field of food, agriculture, and nutrition could be supplied to a considerable extent by increased reliance on the USDA Economic Research Service, other executive agencies with competent analytical staffs, and professors at the land-grant universities. Coordinated use of these resources could make more readily available to Congress a greater amount of expertise and analytical capability than is presently the case.

Of the several options open to Congress in dealing with this important issue, the first to be considered might well be to place a premium on the professional background of the committee and agency staffs as replacements are recruited to fill vacancies caused by retirements and resignations.

Another option would be for the appropriate congressional committee or committees to ask the professionally trained agriculturalists serving Congress either on its committees or in its agencies, to inventory their special capabilities and develop a program of specialization and communication to the end that their outstanding abilities are more fully utilized and Congress is better served.

A third means of increasing the analytical capabilities available to Congress involves more forward planning and increased liaison with the universities and executive agencies having research staffs. The staffs in the executive agencies and professors at the land-grant universities have their own programs of work that must be interrupted when they attempt to respond to emergency requests from Congress. With advance planning and.modest financial assistance in some cases, analysts in research agencies and at land-grant universities have indicated a willingness to devote more of their resources to analyses of issues for Congress.

Table 3.—Bills and Resolutions Dealing with Food, Agriculture, and Nutrition Introduced in the 93rd and 94th Congresses*

Referred to Senate Committees	Number of bills and resolutions	
	93rd	94th*
Aeronautical and Space Sciences	1	2
Agriculture and Forestry	177	114
Appropriations	—	2
Armed Services	—	2
Banking, Housing, and Urban Affairs	17	14
Budget	—	2
Commerce	16	25
District of Columbia	1	—
Foreign Relations	8	11
Finance	23	32
Government Operations	—	14
Interior and Insular Affairs	5	29
Judiciary	14	8
Labor and Public Welfare	55	55
Post Office and Civil Service	4	6
Public Works	1	3
Rules Committee	8	6
Total	330	325
Referred to House Committees		
Administration	5	2
Agriculture	565	560
Appropriations	7	21
Armed Services	1	—
Banking and Currency	116	19
District of Columbia	1	1
Education and Public Welfare	133	98
International Relations	25	89
Government Operations	1	7
Interior and Insular Affairs	9	53
Interstate and Foreign Commerce	373	216
Judiciary	23	32
Merchant Marine and Fisheries	12	3
Post Office and Civil Service	10	41
Public Works	1	6
Rules	20	19
Science and Technology	1	13
Small Business	—	9
Veterans	6	1
Ways and Means	192	210
Total	1,501	1,400

● From the House Bill Status Office.
**As of April 19, 1976.

Table 4.—Actions Taken on Food, Agriculture, and Nutrition Items in the 93rd and 94th Congresses*

	Senate		House	
	93rd	94th**	93rd	94th**
Total referred to committees .	330	325	1501	1400
Items with hearings.	78	7a	382	220
Items reported out ... , ...	73	56	68	67
Items with hearings that did not become law	59	73	359	207
Items reported with no hearings	38	22	20	31
Items passed by each.	75	57	74	75
Items that became law without hearings	7	5	11	5
Items that became law	26	10	34	18

• From the House Bill Status Office.
** As of April 19, 1976.

APPENDIX I

Individuals and Groups Assisting the Office of Technology Assessment in Its Assessment of Food Information Systems

Agribusiness Accountability Project

Dr. James Austin, Harvard Business School

Mr. Ned W. Bandler, Jr., Lever Brothers Company, Incorporated

Dr. Howard Bauman, Pillsbury Company

Ms Anneliese Binder, Food and Agriculture Organization of the United Nations

Mr Wim B. Blaisse, Unilever, Ltd.

Dr. Marguerite Burk, U.S. Department of Agriculture

Dr. Mahlon A. Burnett III, Grocery Manufacturers of America, Incorporated

Dr. William A. Carlson, U.S. Department of Agriculture

Dr. A. Barry Carr, U.S. Department of Agriculture

Dr. Sol Chafkin, Ford Foundation

Dr. S. Kent Christensen, National Association of Food Chains

Dr. William Cromarty, Connell Rice and Sugar Company

Dr. Carleton C. Dennis, Agway, Incorporated

Mr. Frank Frazier, American Agribusiness Associates

Dr. Roy C. Froday, Gerber Products

Professor Martin Greenberger, Johns Hopkins University

Dr. Robert W. Harkins, Grocery Manufacturers of America, Incorporated

Dr. Dale Hathaway, International Food Policy Research Institute

Mr. Howard Hjort, Schnittker Associates

Mr. J. Russell Ives, American Meat Institute

Dr F. James Levinson, Massachusetts Institute of Technology

Dr Pat J. Luby, Oscar Mayer and Company

Dr Dean McKee, Deere and Company

Mr Vernon McMinimy, Continental Grain Company

Dr Leo Mayer, Congressional Research Service, Library of Congress

Mr. Graham T. Molitor. General Mills. Incorporated

Dr. John R. Moore, University of Maryland

National Conference of Catholic Charities

National Consumers League

National Council of Jewish Women

Operation PUSH

Dr. Leroy Quance, U.S. Department of Agriculture

Mr. William Roenigk, National Broiler Council

Mr. Morton Sosland, Milling and Baking News

Mr. 0. V. Wells, Consultant

Background Reports Prepared by

Michigan State Univeristy
East Lansing, Michigan

Sidney M. Cantor Associates
Haverford, Pennsylvania

The Futures Group, Incorporated
Glastonbury, Connecticut

Congressional Staff Interviews

Dr. George Ingram, House Committee on Foreign Affairs

Mr. Hyde H. Murray, House Committee on Agriculture

Mr. Charles Paolillo, House Committee on Foreign Affairs

Mr. Kenrieth Schlossberg, Senate Select Committee on Nutrition and Human Needs

Mr. Henry Casso, Senate Committee on Agriculture and Forestry

Mr. Michael McLeod, Senate Committee on Agriculture and Forestry

Dr. Dale L. Stansbury, Senate Committee on Agriculture and Forestry

Mr. Alan J. Stone, Senate Select Committee on Nutrition and Human Needs

Mr. James E. Thornton, Senate Committee on Agriculture and Forestry

Office of Technology Assessment Staff

Mr. Joseph F. Coates
Mr. Dennis F. Miller
Mr. Thomas P. McGurn
Mr. Thomas L. Trumble
Mr. Charles W. Wixom

APPENDIX II

Witnesses

Technology Assessment Board Hearings on Food Information Systems

Dr. Martin E. Abel. ., ... Director, Economic Development Center, University of Minnesota

The Honorable Richard E. Bell. . . . . Assistant Secretary of Agriculture for International Affairs and Commodity Programs, U.S. Department of Agriculture

Dr. W. D. Buddemeier. . . . . Director, International Agricultural Programs, University of Illinois

Dr. Willard W. Cochrane, , , ..., ... Professor of Agricultural Economics, University of Minnesota

Dr. John M. De Noyer. . . . . , ... Director, Earth Resources Observations Systems (EROS) Program, Geological Survey, U.S. Department of the Interior

Mr. Charles L. Frazier. ., , ., , ... Director, Washington Staff, National Farmers Organization

Dr. Dale E. Hathaway , ... , , ... Director, International Food Policy Research Institute

Mr. W. E. Hamilton, ... Chief Economist, American Farm Bureau Federation

Mr. Hosea S. Harkness. . . . . Director of Planning, Agri-Products Group, Cook Industries, Incorporated

Dr. Howard L. Hill , ... Project Manager, Large Area Crop Inventory Experiment (LACIE) Project Group, Foreign Agricultural Service, U.S. Department of Agriculture

Mr. Howard J. Hjort . . . . . Vice President, Schnittker Associates

Mr. David L. Hume, ., , , ., ..., ... , Administrator, Foreign Agricultural Service, U.S. Department of Agriculture

Mr. E. A. Jaenke. , , ., ... , ... , , ., ... , . . . President, E. A. Jaenke and Associates

Mr. Reuben Johnson . . . . . , , ... , , , , ... , , , . . Legislative Representative, National Farmers Union

Mr. David Keefe. . . . . Head, Commodity Group, Lamson Brothers

Mr. Charles W. Mathews . . . . . Associate Administrator for Applications, National Aeronautics and Space Administration

Dr. Don Paarlberg .., ... ,. Director of Agricultural Economics, U.S. Department of Agriculture.

Dr. Archibald B. Park	Vice President, Research and Development, Earth Satellite Corporation
Mrs. Esther Peterson	Consumer Adviser, Giant Food Inc.
Mr. Melvin S. Sjerven	Senior Editor (Markets), Milling & Baking News
Mr. Lauren Seth	Chairman, Agriculture Committee, National Planning Association
Dr. Luther Tweeted	Professor of Agricultural Economics, Oklahoma State University
Dr. Quentin M.West	Administrator, Economic Research Service, U.S. Department of Agriculture
Dr. Robert M. White	Administrator, National Oceanic and Atmospheric Administration, U.S. Department of Commerce

Additional Background Material for OTA Hearings Preparedby

Agency for International Development
U.S. Department of State

Dr. Harry C. Trelogan
Consultant

Bureau of the Census
U.S. Department of Commerce

APPENDIX III

Twenty-Six Decision Centers*

It is extremely difficult, if not impossible, to indicate each and every organization, department, bureau, agency, council, board, and committee that has by law or executive order been given some significant responsibility for at least one aspect relating to food, Many involve the inputs to agriculture; some involve the production process itself. Others involve marketing, distribution, and quality control. A number affect the overall supply and utilization of food—particularly when consumers and voters are up in arms over food prices,

This paper will attempt to enumerate the major agencies, departments, or Government bodies that have some significant input in the total food equation.

1. Department of Agriculture, with its 23 agencies, has the prime responsibility for many aspects of food, its production, and use,
2. Department of Labor, through its Rural Manpower Service of the U.S. Employment Service, its Office of Manpower Development programs, its National Migrant Workers program, and its administrative responsibility for occupational safety and health, is deeply involved in a number of aspects relating to food,
3. Department of State, likewise is involved through its Under Secretary for Economic Affairs, its Under Secretary for Political Affairs, its Assistant Secretary for International Organization Affairs, its semi-independent Agency for International Development, and its coordinator of the Food for Peace program.
4. Department of the Interior has inputs in the food area through its Bureau of Land Management which controls livestock production on Federal lands, its Bureau of Commercial Fisheries, its Bureau of Reclamation, and its Office of Land Use and Water Planning.
5. Department of Commerce and its Domestic and International Business Administration work with businesses involved in the processing, handling, and exporting of food products.
6. Department of Army, Corps of Engineers, with its jurisdiction over the Nation's water resources development actually has tremendous effect on agriculture.
7. Department of Health, Education, and Welfare plays an important role particularly through its Food and Drug Administration.
8. Department of Transportation has at least seven entities directly involved in transportation matters which have major impact on the supply of productive inputs or the transportation of raw or processed agricultural commodities.
9. Federal Energy Administration, with programs of allocation of energy supplies to agriculture, is deeply involved. Its decisions affect the ability of farmers to produce food and its proper handling and processing.
10. Treasury Department plays an important role particularly under the current government organization which brings the Secretary of Treasury into nearly all economic decisions.
11. Farm Credit Administration, supplying nearly one third of the capital needs of agriculture, is involved,

*Jaenke, Hearings pp. 175–178,

12. Central Intelligence Agency, with its analyses of world production, has become a significant part of the decisionmaking process.

13. Environmental Protection Agency, with its rulemaking authority in the agricultural field, can greatly increase the cost of food production as well as affect the ability of farmers to produce the quantities of food needed.

14. Federal Trade Commission, with its responsibilities over legislation affecting competition, is involved in food policy.

15. Federal Maritime Commission is concerned with the conditions of export of products including food products.

16. Federal Reserve System, with at least six of its banks located in heavily productive agricultural areas and with its decisions so intricately interwoven with national economic policy, is a key actor in the food decisionmaking process.

17. Commodity Futures Trading Commission, recently established to regulate futures trading, has a significant role and effect.

18. International Trade Commission, with its enforcement of import and export policies, affects food production and distribution.

19. Office of Management and Budget plays a major role in determining food production and utilization through its influence on policy and expenditures.

20. Domestic Council, charged with longrange planning and with making Presidential and legislative recommendations, is involved.

21. Council of Economic Advisors provides significant analyses and inputs into decisionmaking processes involving food,

22, Council on Wage and Price Stabilization, particularly during its most active period of the early 1970's, had tremendous influence on agricultural policy.

23. Office of Special Representative for Trade Negotiations is a key actor since agricultural trade is the largest single item involved in our balance of payments and, as a result, greatly affects how much farmers will be paid to produce food.

24. National Security Council is involved in all major international political and economic affairs.

25. Council on International Economic Policy was created by Presidential memorandum in January 1971 to improve the coordination of U.S. Government agencies in the field of foreign economic affairs. With food playing so important a role, the CIEP becomes part of the decision-making process.

26. President's Economic Policy Board, established to advise the President concerning all aspects of national and international economic policy. , and serve as a focal point for economic policy decisionmaking, has an important effect on food availability y.

Each of the above has some responsibility for decisionmaking in matters that affect food policy. In many instances, a decision by some of the above can have not only short-range but very important long-range effects. As an example of this, decisions in the field of energy have major impacts in the energy-intensive modern agricultural plant.

APPENDIX IV

Statement of Dr. Robert Nesheim
Chairman, Nutrition Panel of the Food Advisory Committee

Nutrition Information Assessment

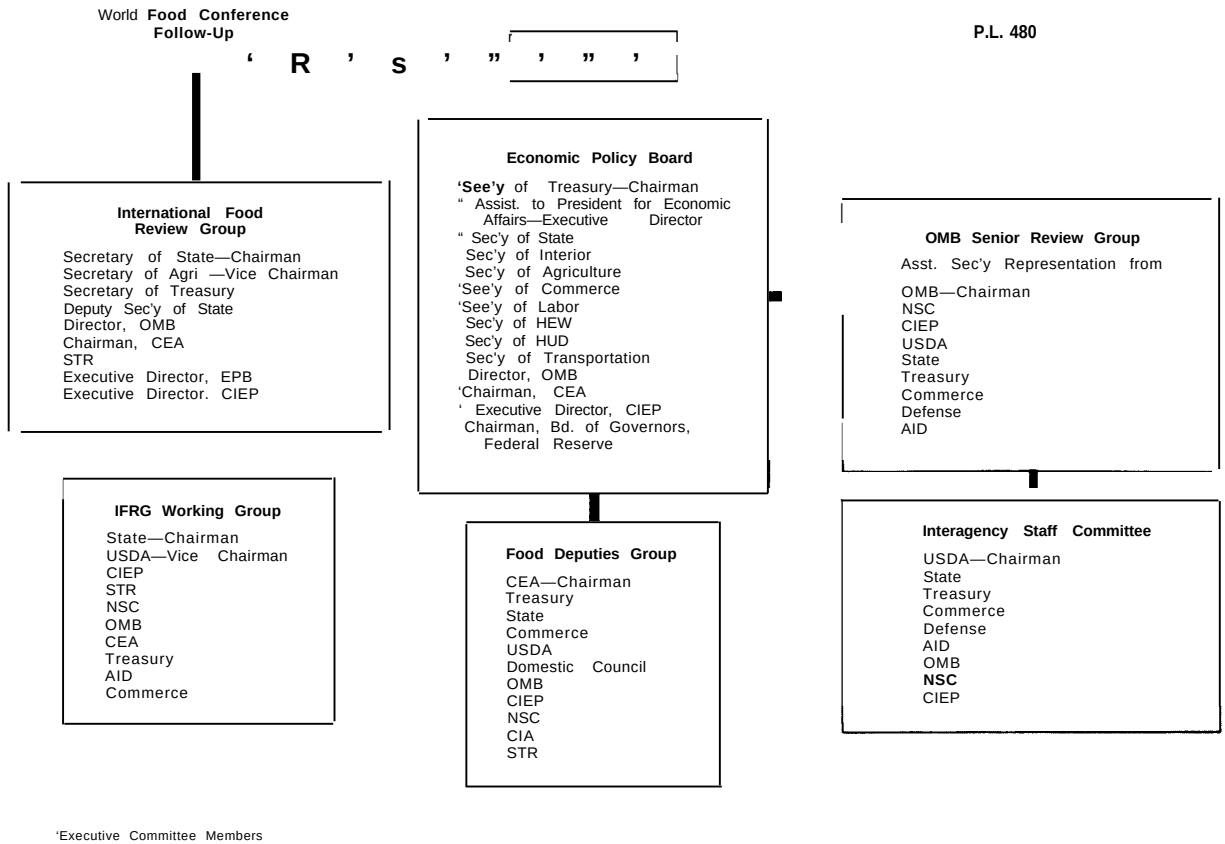
Although Congress has passed dozens of bills affecting the nutritional status of Americans, surprisingly little is known about the nutritional status of this Nation. In an effort to alleviate hunger and the manifold problems related to it, numerous food delivery programs have been legislated and implemented. These programs are aimed at providing food to the target populations believed to be most in need of supplemental nutritional assistance, Thus these programs attempt to provide a level of nutritional sufficiency to the target population. This assumption raises many poignant questions relating to the quantity and quality of the information which Congress received prior to making these determinations. How is the target group selected? Who are the nutritionally deficient in this Nation? What are their deficiencies? Why do deficiencies exist in their diets? Reasons include:

a. Inadequate purchasing power,
b. Poor selection of food items from money available,
c. Cultural. food habits,
d. Inadequate preparation facilities, etc.

What are the nutritional requirements of the population? Are these programs, in fact, meeting their intended objectives?

Because of the serious implications these questions raise as to the adequacy of channels of nutrition communication and the quality of information

Figure 21 .—Executive organization for food issues



'Executive Committee Members

available, the nutrition panel will explore in depth the nature of available and necessary nutrition information and examine how it might be used in Congress.

In an effort to assess the extent and adequacy of nutritional information, it is essential to study the various components of the nutrition process and the information flow related to it?

Although several studies are presently being undertaken or considered which involve analysis of various components that we will evaluate, it is important to note from the outset that their thrust is not identical to ours.

The National Center for Health Statistics, HEW, is now administering Health and Nutrition Examination Surveys (HANES) to obtain data for use in national health program planning. Although the information is being collected on a rather small scale, this will be among the information networks that our assessment will evaluate. Furthermore, the Administration is considering the establishment of a multiagency Federal food consumption data bank. It is anticipated that our assessment will be of assistance in establishing and implementing such a system. It should also be pointed out that the Food and Nutrition Board of the National Academy of Sciences will be updating the Recommended Dietary Allowance (RDA) guidelines in the near future. Such an effort, however, will not overlap or infringe upon the nutrition panel's proposed undertaking.

This assessment will, in fact, analyze the information input and utility of the RDA to the consumer and, if necessary, propose improvements. It is anticipated that our assessment may utilize and analyze other studies being done, but it is not expected to duplicate the research efforts of these studies.

Before Congress makes any decisions regarding food delivery programs, members should be aware of the nutritional state in this Nation. Thus it is imperative that a knowledge of the nutritional status of the population and its various segments be obtained. Several attempts have been and are presently being made to accomplish this formidable task,

Presently, there are government agencies gathering varied and often overlapping nutrition information. Both the USDA and HEW are involved in food delivery programs and have, to some extent, gathered nutritional information and statistics relating to the Nation's population. There is, however, no clear, concise understanding of exactly what or how much information each agency collects or distributes or whether the frequency of the surveys is adequate. Neither has there been an analysis of the collection processes. If a national surveillance system is to be implemented, an evaluation of the information presently being collected would be a first step, This system should indicate the magnitude and extent of nutritional deficiencies by geographical area, income level, age group, ethnic group, and other identifiable characteristics. It would be necessary to evaluate proposals for surveillance systems considering such questions as: How should the sample to be monitored be drawn? Are there particular groups which should be observed because of suspected nutritional problems ? Should the information be gathered by a government agency or through a contractual agreement with a private firm?

How often should the information be reported? How shall it be collected? Moreover, it would be necessary to consider the type of information which might be collected: Should the monitoring be conducted on a random sample of the population or merely on certain specified target groups? Should the existing food delivery systems be monitored for effectiveness in their ability to reach their target groups and/or for the nutritional quality of the food delivered? Nutrition surveys tend to be expensive and time-consuming. Are there innovative approaches that can yield timely and useful information on a cost-effective basis?

These are some of the most obvious questions, the answers to which would help Congress determine if a survey and surveillance are feasible, or even desirable. Our objective will be to explore the questions that would have to be addressed in establishing a surveillance system, evaluate the information that we have presently and/or need to obtain, and outline the alternative surveillance options available to Congress.

Food Consumption

Since people require nutrients but eat foods to obtain these nutrients, it is important that we have sound information on what people eat, First, we must collect and analyze the existing surveys of food consumption, most notably the USDA's Household Food Consumption Survey (HFCS). This should be evaluated with regard to the adequacy of

the survey's consideration of differences between the total household consumption and the consumption level of individual family members, as well as differences between consumption levels based on age, sex, ethnic group, income, and geographical area. Varying food consumption habits result in deviations in nutrient intake.

Thus, it is essential to monitor food consumption habits to maintain information on the nutritional status of key segments of the population and thus gain some insight into the nutritional status of the population. In this respect, we should analyze the differences in quality and type of food consumption for each group and the effect of these differences on the health of individuals within a particular group. The end result will be to state the options available for implementing a survey of food consumption with cost and feasibility alternatives.

We will, at the same time, attempt to synthesize the existing information into a cohesive framework. In doing so, we will gain insight into the quantity and quality of information that is currently available, how these sources of information contrast with each other, and how they can be improved.

Food Composition

Because people eat food but require nutrients, it is essential to determine the nutrient composition of specific foods, both processed and unprocessed. Many recommendations have been made as to possible methods of analyzing food composition. It is important to determine what these theories are, how they relate to each other, and where they differ. Additionally, these must be assessed in terms of their ability to be implemented in a continuous and consistent manner for all foods.

The USDA has for years been determining and recording the composition of a broad spectrum of the foods available for American consumption. Known as Handbook 8, this volume has been relied upon by all segments of the food delivery chain for ready reference on food composition. Thus, one task before the nutrition panel will be to examine Handbook 8 to determine if it provides a comprehensive analysis in terms of foods surveyed and nutrients enumerated, ability to remain" current, validity of findings, and dissemination of information to the public in a comprehensive manner.

Consideration should also be given to the following:

- Which nutrients are or should be included 'in the analysis?
- Does the handbook properly reflect the influence of processing and storage on nutrient content of foods as delivered to the consumer?
- Does the processing and storage technology differentially affect the nutrient content of food? What are the trade-offs in terms "of food availability, nutrient preservation and economic viability?

Thus, the assessment should evaluate whether it is, in fact, possible to analyze the nutrient content of foods, validly and in a meaningful manner, in light of the technology applied in the marketing process, and to summarize it effectively.

Nutrition Requirements

Nutrition is intrinsically related to health. It is impossible, however, to recommend nutrient intake levels for individuals without an evaluation of the nutrient requirements of these individuals. Moreover, an assessment of nutrient requirements should evaluate the feasibility of considering the varied requirements of different segments of the population based on age, sex, present state of health, and environmental situation,

Any assessment of nutrient requirements should also examine the RDA—what it is, what information it utilizes and provides, and how effective it is. Particular attention should be given to the RDA and its users, since this is used extensively in measuring adequacy of nutrient intakes, recommending diets, and evaluating nutritional needs. Other suggestions for establishing nutrient requirements should be considered and analyzed with attention to ease of obtaining information, cost, timeliness of obtaining results, and the validity of applying the information to the target population.

What we must bear in mind in considering each of these components is that this assessment will deal with information options rather than with policy alternatives. By enumerating the nutritional components and evaluating the available information in terms of quantity, quality, what information is needed and how, or if, it can be obtained, we will have completed the first step toward helping Congress to formulate a nutrition policy. If this is to be achieved, it is only with quality information in sufficient quantity that responsible decisions can be made.

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