Mathtech The Technical Research and Consulting Division of Mathematica, Inc.

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FINAL REPORT

POULTRY IMPROVEMENT PROJECT - EGYPT

USAID GRANT NO. 263-0060

SEPTEMBER 1980

VOLUME I of II

This report represents the final assessment of the team of experts who participated in this most comprehensive ever study of the entire poultry sector of Egypt. It was conducted under the direction of:

THE FOOD, AGRICULTURE & NUTRITIONAL SERVICES (FANS) GROUP

MATHTECH, INC.

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A Division Of:

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Mathtech The Technical Research and Consulting Division of Mathematica, Inc.

The Honorable Dr. Mahmoud M. Dawood
The Minister of Agriculture
The Government of the Arab Republic of Egypt
Dokki, Cairo, Egypt

September 15, 1980

Thru: Dr. Mahmoud Kheireldin
First Undersecretary of Agriculture
Project Director - Poultry Improvement Project

Regarding: The Final Report
The Poultry Improvement Project
USAID Grant Number 263 - 0060

Copies: USAID - Egypt
USAID - Washington

Dear Dr. Dawood:

Enclosed herewith are fifteen (15) copies of the two (2) volume set of the final report and recommendations of the poultry improvement project, completed on the 10th day of September 1980. These are respectfully submitted for use and distribution as desired.

We of the project team are pleased to have been a part of this project which we believe will provide Egypt with the basis of a sound program for poultry improvement. As the reports will indicate, a great deal is yet to be done, and we regret we are not not able to be working with you to achieve the goals of Egypt's Food Secrurity program, at least at the present time. Please know we stand ready to further assist in any way possible.

Of greatest importance, we believe the objectives of Egypt's 5 and 20 year Food Security programs as concerns poultry and related matters, is achievable although the task is also formidable. It will require further development of a comprehensive and sound plan which will efficiently utilize all available resources. We are sure that effectively managed, the assistance which should be available from various international agencies, in consort with Egypt's own resources, should be sufficient to accomplish the plan's objectives. Please know that our thoughts and prayers are with you.

Kindest regards,
For The Team.

George O'Day, Director
Food, Agriculture & Nutritional Services

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FINAL REPORT

POULTRY IMPROVEMENT PROJECT - EGYPT

TABLE OF CONTENTS - VOLUME I

TABLE OF CONTENTS - VOLUME I

PAGE 2

FINAL REPORT

EGYPT - POULTRY IMPROVEMENT PROJECT

AID GRANT NO. 263-0060

SECTION I - EXECUTIVE SUMMARY

A. INTRODUCTION

The Poultry Improvement Project was designed to provide analysis and plans for future expansion of the poultry sector. It was also designed to facilitate production, as possible, by improving efficiency within the existing industry through technical assistance and training of a core of management personnel in the Egyptian Poultry Industry. Specifically, the original objectives, as stated in the Project Paper, were to:

- Provide an analytical assessment of poultry sector status and requirements.
- Provide recommendations to the General Poultry Company, a major agency of the Ministry of Agriculture which is responsible for poultry production in Egypt.
- Provide a national plan for increasing availability of vaccines and pharmaceuticals to the Egyptian Poultry Sector.
- Provide recommendations for a breed and hatchery improvement program.
- Provide an analysis of village flock production in the rural sector of Egypt.
- Supervise the improvement of three breeding and hatching farms.

The Poultry Improvement Project was conducted for, and under the auspices of, the Ministry of Agriculture (MOA) of the Government of the Arab Republic of Egypt (GOARE) under a host country contract funded by the United States Agency For International Development (USAID). Technical assistance, commodity support planning, and a training program were provided by the U.S. contractor -- The Food, Agriculture and Nutritional Services (FANS) division of Mathtech, Inc., a subsidiary of Mathematica, Inc. Both firms are headquartered in Princeton, New Jersey, U.S.A. However, the FANS division's offices in Atlanta, Georgia, U.S.A., served as the principal project office. A project branch office was established in Cairo, Egypt to coordinate all field activities.

SECTION I - EXECUTIVE SUMMARY

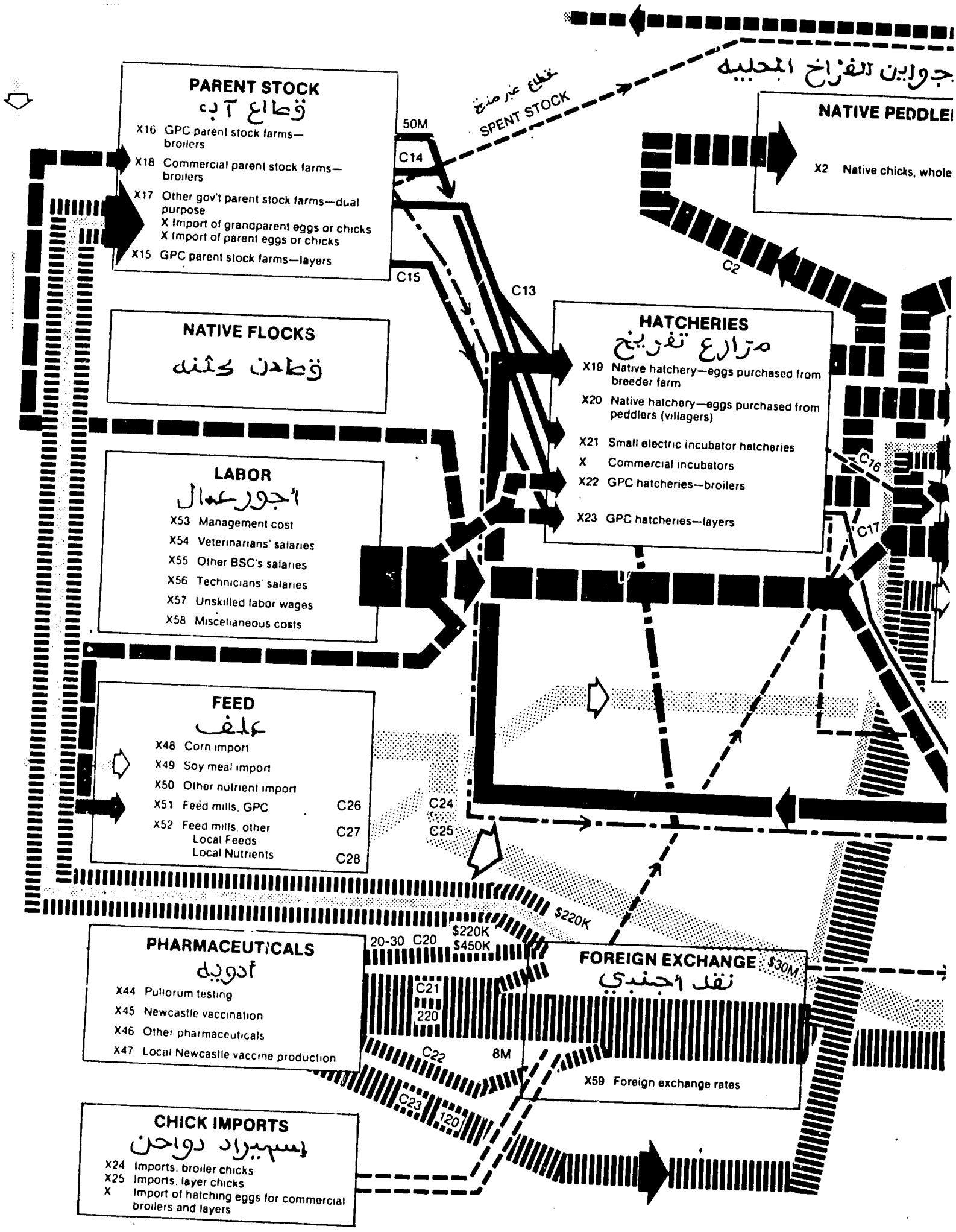
To fulfill the initial objectives of the project, the scope of the project was expanded as it progressed through to completion. This expansion was necessary to encompass all facets of the Egyptian economy which were impacted by, or have impacts on, the poultry sector. The study was national in scope with macro and micro analysis conducted in all key segments of the project. These key segments were graphically illustrated so as to serve as the basis for subsequent field tasks, analysis, and the econometric model subsequently constructed in a linear programmed format for both mechanical and computerized compatability. The sector flow chart, as developed by the team, is illustrated on the following fold-out page.

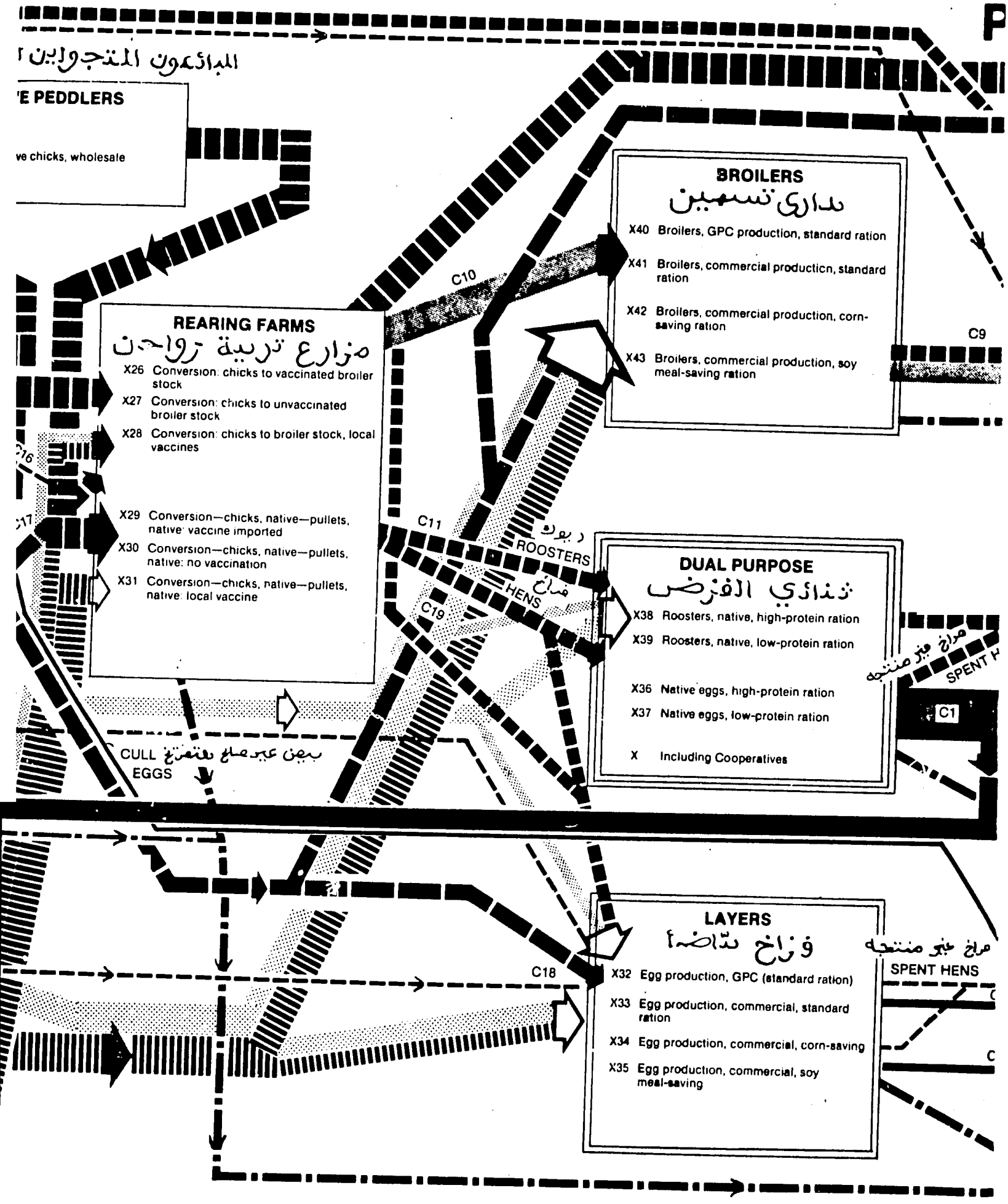
Mathtech utilized up to 41 different technicians and specialists in the project, as well as necessary support personnel in Egypt and the United States. The project commenced on September 10, 1978, and was completed on the same date in 1980. While the original project design specified approximately 2,500 person-days of consultancies and technical assistance, due to the expanded scope of effort, at least 5,345 person-days were actually provided. The project was completed on schedule and within budget.

A major goal of the Egyptian Government is to improve the nutritional inputs of the Egyptian diet. According to the best information available, the average Egyptian consumes no more than 4 kilos of high quality protein food annually. This amount is only one-third of the minimum 12 kilos per year of high quality protein food recommended by the United Nations as the internationally accepted nutritional standard for reasonable health and longevity of life.

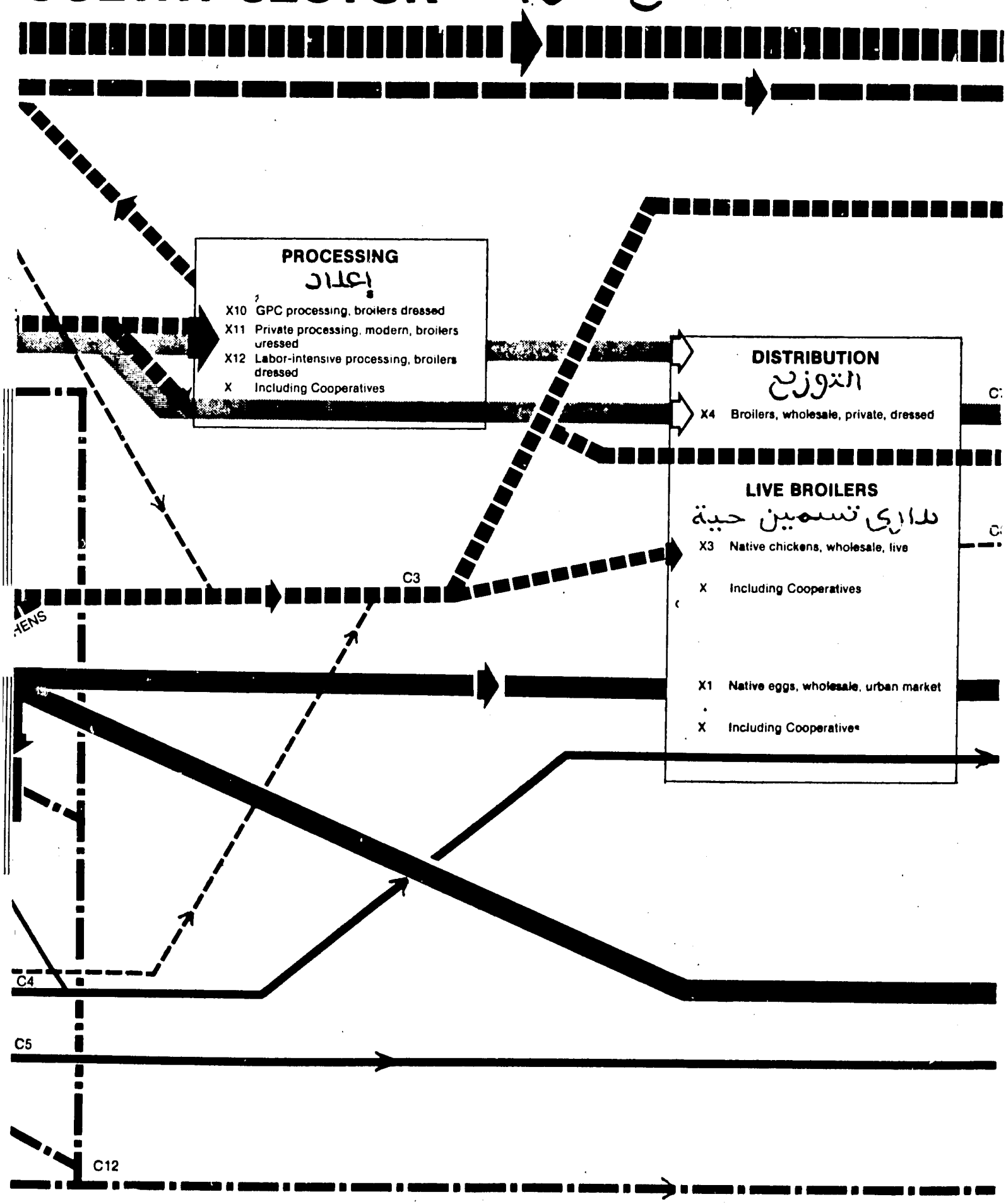
To accomplish the goal of improving the Egyptian diet, President Sadat of Egypt has initiated five and twenty-year development plans which encompass significant increases in these high quality protein foods. However, reaching the 12 kilo objective will require a substantial improvement in resource utilization, most notably land, existing facilities, and cash reserves. Since the majority of the land mass in Egypt is arid, with only approximately 10 percent of its land arable, Egypt has targeted on food production opportunities, such as poultry, which are not land intensive.

While livestock and fish/sea food are also excellent sources of the needed high quality protein food, each area has major constraints. Livestock projects are significantly more land intensive and require multiyear development cycles not necessary for poultry production. There are still many unanswered problems regarding cultured fish production, which is also more land intensive than


PARENT STOCK
قطاع آبء
X16 GPC parent stock farms—broilers
X18 Commercial parent stock farms—broilers
X17 Other gov't parent stock farms—dual purpose
X Import of grandparent eggs or chicks
X Import of parent eggs or chicks
X15 GPC parent stock farms—layers
50M
C14
C15
SPENT STOCK
NATIVE PEDDLE
X2 Native chicks, whole
C2
C13
NATIVE FLOCKS
HATCHERIES
مزارع تفريخ
X19 Native hatchery—eggs purchased from breeder farm
X20 Native hatchery—eggs purchased from peddlers (villagers)
X21 Small electric incubator hatcheries
X Commercial incubators
X22 GPC hatcheries—broilers
X23 GPC hatcheries—layers
C16
C17
LABOR
أجور عمال
X53 Management cost
X54 Veterinarians' salaries
X55 Other BSC's salaries
X56 Technicians' salaries
X57 Unskilled labor wages
X58 Miscellaneous costs
FEED
علف
X48 Corn import
X49 Soy meal import
X50 Other nutrient import
X51 Feed mills, GPC C26
X52 Feed mills, other C27
Local Feeds
Local Nutrients C28
C24
C25
$220K
20-30 C20 $220K $450K
PHARMACEUTICALS
أدوية
X44 Pullorum testing
X45 Newcastle vaccination
X46 Other pharmaceuticals
X47 Local Newcastle vaccine production
FOREIGN EXCHANGE $30M
نقد أجنبي
C21
220
C22
8M
X59 Foreign exchange rates
C23
120
CHICK IMPORTS
إستيراد دواجن
X24 Imports, broiler chicks
X25 Imports, layer chicks
X Import of hatching eggs for commercial broilers and layers


E PEDDLERS
ve chicks, wholesale
REARING FARMS
X26 Conversion: chicks to vaccinated broiler stock
X27 Conversion: chicks to unvaccinated broiler stock
X28 Conversion: chicks to broiler stock, local vaccines
X29 Conversion—chicks, native—pullets, native: vaccine imported
X30 Conversion—chicks, native—pullets, native: no vaccination
X31 Conversion—chicks, native—pullets, native: local vaccine
BROILERS
X40 Broilers, GPC production, standard ration
X41 Broilers, commercial production, standard ration
X42 Broilers, commercial production, corn-saving ration
X43 Broilers, commercial production, soy meal-saving ration
DUAL PURPOSE
X38 Roosters, native, high-protein ration
X39 Roosters, native, low-protein ration
X36 Native eggs, high-protein ration
X37 Native eggs, low-protein ration
X Including Cooperatives
LAYERS
X32 Egg production, GPC (standard ration)
X33 Egg production, commercial, standard ration
X34 Egg production, commercial, corn-saving
X35 Egg production, commercial, soy meal-saving
ROOSTERS
HENS
CULL EGGS
SPENT HENS
C1
C9
C10
C11
C16
C17
C18
C19

OULTRY SECTOR قطاع الدوجن



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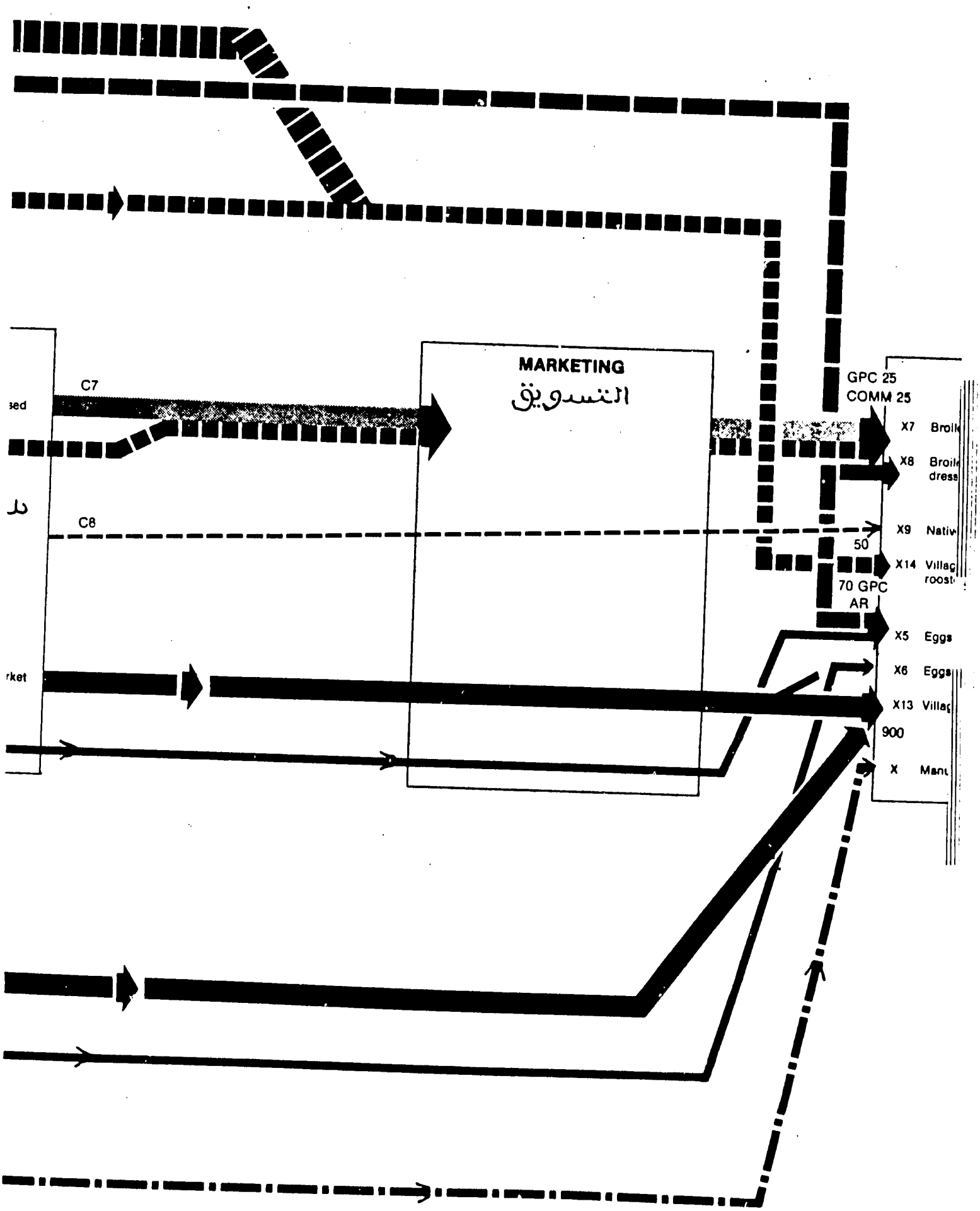
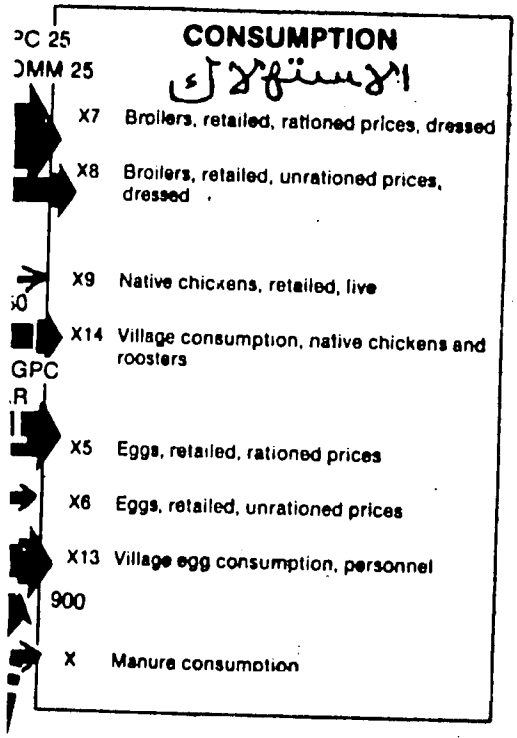
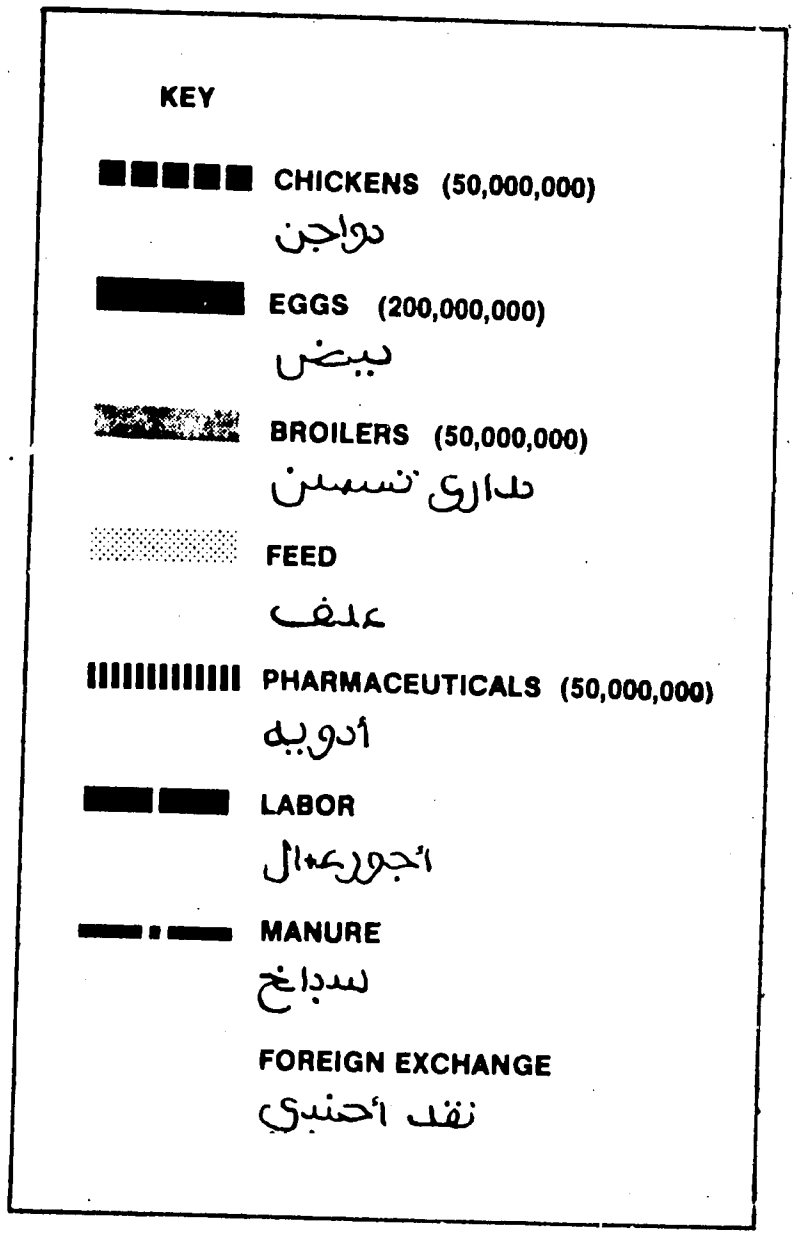
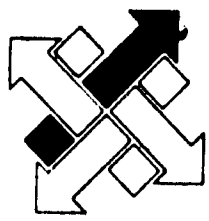

MARKETING
التسويق
C7
C8
GPC 25
COMM 25
X7
X8
X9
50
X14
70 GPC
AR
X5
X6
X13
900
X


CONSUMPTION
الاستهلاك
PC 25
OMM 25
X7 Broilers, retailed, rationed prices, dressed
X8 Broilers, retailed, unrationed prices, dressed
X9 Native chickens, retailed, live
X14 Village consumption, native chickens and roosters
GPC
R
X5 Eggs, retailed, rationed prices
X6 Eggs, retailed, unrationed prices
X13 Village egg consumption, personnel
900
X Manure consumption


KEY
CHICKENS (50,000,000)
دواجن
EGGS (200,000,000)
بيض
BROILERS (50,000,000)
داري تسمين
FEED
علف
PHARMACEUTICALS (50,000,000)
أدويه
LABOR
أجور عمال
MANURE
لمدابغ
FOREIGN EXCHANGE
نقد أجنبي



Mathtech

poultry. Fish is not as widely accepted a food choice as is poultry, and it is more difficult to handle and distribute to the consumer without potentially high waste factors than poultry.

Another major problem facing Egypt is its rapidly increasing population, which is growing at an annual rate of approximately 2.8 percent. In 1978, Egypt's population was estimated to be approximately 40 million persons; by the year 2000 its population is projected to reach approximately 70 million persons. Egypt, therefore, faces the challenge not only of overcoming existing deficiencies in high quality protein foods, but also of providing for its significant increases in population.

The Government of Egypt has, therefore, established a high priority on increased poultry production. In its current program objectives, poultry meat is projected to supply approximately 6 kilos per person per year, and table eggs another 2 kilos per year of the 12 kilo objective. The Poultry Improvement Project was to address all issues necessary to be resolved for the Egyptian Poultry Sector to fulfill its role in the Food Security Program of the Government of Egypt.

B. MAJOR FINDINGS

The majority of poultry production in Egypt takes place in the rural sector. More than 50 percent of the poultry meat and 90 percent of the table eggs are produced in the native flocks of Egypt's more than 5,000 villages. Approximately 25 percent of the poultry meat and 8 percent of the table eggs are produced by the General Poultry Company (GPC), an agency of the MOA and GOARE. Less than 25 percent of the poultry meat and 2 percent of the table eggs consumed in Egypt are produced by the private sector. GPC is also responsible for assuring the supply of critical feed, vaccines and pharmaceuticals to the private sector. as well as all poultry sector licensing. Therefore, the most influential entity in the poultry sector of Egypt is the General Poultry Company. Without its existence at the present time, the poultry sector of Egypt could not survive.

Unfortunately, the GPC is constrained by a number of items over which it has no control or authority to change. These items impede and complicate its role as the major element in private sector development. Customs fees and duties on

critically needed items (which must be imported for poultry production) place excess burdens on private sector producers. There is no market reporting system by which any producer of poultry can determine market situations which ultimately have strong impacts on profit and return on investment of the private sector producers.

The Ministry of Supply, using donor and other funds, purchases large amounts of frozen poultry from abroad, and releases that product in large quantities without coordination or regard for the major negative impact such releases have on domestic market conditions. There is no centralized control or coordinating point in Egypt, for all factors involved in successful poultry production, marketing, and sectoral conditions. Although significant improvement can be seen in poultry production opportunities, there is limited coordination of Egypt's scarce resources to achieve the poultry production objectives in the five and twenty-year development programs, and the Food Security Program.

A number of misconceptions existed at the start of the project. Initially, it had been considered that the major impediments to increased poultry production were limitations on feed, vaccines, pharmaceuticals, and capital investment. While all are true to varying degrees, the actual situation is of a somewhat different context.

Contrary to the stated situation at the time of project startup in 1978, poultry disease was found to be a major factor not previously identified as a major constraint. During the project it was determined that many of the available modern poultry husbandry technology and management techniques were not being used to the benefit of the Egyptian Poultry Sector. While feed, vaccines, and pharmaceutical supplies are not nearly sufficient to fulfill the existing needs of Egypt's poultry sector (particularly to the village flocks), available supplies are not being utilized nearly as effectively as is possible.

Other major misconceptions concern the market for poultry product in Egypt, and the situation regarding foreign investment in the poultry industry of Egypt. While it is granted that the market for poultry product in Egypt is indeed huge, the market as currently structured cannot absorb, at any given time, all the poultry product which may be available or produced. Poultry is primarily sold in the whole, live state. Therefore the consumer must have sufficient cash available for the whole bird.

Banking laws and Egypt's current economy further complicate the problem. It is extremely difficult for the average Egyptian to open and maintain a bank account of any kind.

There is also a significant lack of refrigeration in Egypt at the consumer, retail, and distribution levels. Most purchases are made for almost immediate consumption. There is sufficient cold storage capacity at the distribution levels to accomodate enough poultry to maintain a balanced supply of poultry at retail, but it is not being effectively used. Additional capacity is available through utilization of limestone caves near Cairo, which may be converted rapidly into low-cost refrigerated storage space for any additional capacity required. The rapid take-up of imported frozen poultry released by the Ministry of Supply indicates that the lack of refrigerated storage in the home would not be a major impediment to a broader use of frozen or refrigerated dressed poultry, or to the marketing of poultry parts.

A large percentage of confined poultry production units in Egypt, such as those normally found in commercial units, have significant problems either due to obsolescence, spare parts, maintenance, improper design, or equipment service and quality problems. Through appropriate re-engineering and re-equipping, production in existing facilities could be increased up to 30 percent over current results. This is particularly true of feed mills, and the Abbassia vaccine production facility of the MOA's Animal Health Research Institute. Because of the existing constraints to production of those units, Egypt is forced to spend its hard pressed capital reserves to import supplies of the necessary quality.

Shortages of key feed ingredients pose a major problem to increased poultry production. While a major effort has been made to increase essential production of soy beans, there is still a major shortfall of maize production which is also required for livestock, dairy, and human nutrition. All fishmeal is imported for Poultry rations; however, it is possible to eliminate such use through reformulation and substitution, which many poultry producers in the USA have successfully accomplished. The technology used for most efficient feed formulation in other countries generally is not practiced in Egypt. Therefore feed conversion is generally higher than realistically possible. Through the use of modern practices,

elimination of waste, and centrally coordinated use of feed resources, it is believed that feed supply utilization could be improved up to 40 percent.

Prior to the start of the project, it was believed that poultry in village flocks survived through scavenging for food in the villages. It was also believed that they were not confined in any fashion. While this is true to some extent, the majority of the village flocks surveyed in this project were in relative confinement. Also they were fed primarily table scraps, as well as a balanced feed ration which the owner purchased when such ration was available.

It was determined during the project that the majority of poultry product from village flocks was distributed in the same urban markets as other poultry produced in Egypt by GPC and the private sector. Poultry production is a major source of income to the village producers. When prices were depressed in these urban markets, due to a temporary oversupply of poultry, village producers suffered from the same deficient returns as did private sector producers. The composition of the poultry market was found to be much more interwoven than previously believed.

Mortality and disease were found to be significantly more prevalent in the village flocks than in private flocks and GPC units. This fact is primarily due to the inadequate infrastructure designed to support the village sector. Other factors are the continued use of native rather than developed breeds, and the recycling of fertile village flock eggs to the village flocks. Vaccination and disease prevention programs are almost non-existant in the infrastructure supporting this traditional sector. Combined with the use of genetically deteriorated breeds through the native hatcheries, these factors have caused major deficiencies in village flock productivity.

Contrary to the initial belief of the project team, the native hatcheries were found to be an essential, not yet replacable ingredient in village flock production. There is no other infrastructure now existing which could substitute for the native hatcheries. These hatcheries now number between 600 and 650 units scattered throughout Egypt. Unfortunately, there is no program which makes available a sufficient quality of affordable, and genetically appropriate hatching eggs or day old chicks, for sale to the village flock hatcheries.

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SECTION I - EXECUTIVE SUMMARY

No evidence has been found to substantiate initial claims that the native breeds used in this sector are better than or even equal to, those of other imported strains. In fact, the study indicated productivity of the native breeds is substantially lower than that available from imported strains. No breed tests have been conducted for a number of years, and no records exist for any previous tests.

The capacity of the MOA breeding farms and hatcheries, designed to support the village sector with disease free stock, is not now capable of supplying that sector's needs. The equipment and the design of most MOA farms are not appropriate for maximum production. Most have equipment no longer used in the modern day industry; their activities are not centrally coordinated; and their equipment, while not necessarily modern, is still usable to a large degree but is somewhat out of balance. Additional laying pens and other relatively minor changes or additions could almost double the existing capacity.

The Extension/Veterinary Service of the MOA is understaffed, underbudgeted and does not have sufficient capacity to support the village flock programs. It receives less than 15 percent of its total needs, has limited transportation, and inadequate quantities of inferior quality vaccines produced in the AHRI facility at Abbassia. The facility at Abbassia is obsolete and should be replaced. However, since such a program would require 3 years or more, a relatively small input of capital and changes in its operating practices could provide up to twice its current output of reasonably acceptable vaccines so urgently needed to control and prevent the poultry diseases which are revenging Egyptian flocks. Abbassia vaccines are produced at one-third to one-half the cost of imported vaccines, which are unnecessarily and heavily taxed.

As part of the program to serve the interests and needs of the poultry sector, an investigation was made of the interest of US firms relative to investment and/or involvment in Egypt. Areas explored concerned vaccine production, pharmaceutical production, poultry production and feedstuffs. While interest improved during the two-year course of the project, none had yet developed to the point of active participation or serious involvement in such preliminary steps as feasibility and Pre-Investment studies. The major constraint was that under existing circumstances, the American firms must bear the total costs of such studies.

Major reasons for the lack of interest concerned the instability of the Egyptian poultry market and economy. Poultry producers had no confidence they could achieve any degree of profit or return on investment under current conditions. Vaccine producers were of the same opinion, and feared possible drastic changes in Egypt over the three-year period necessary to activate a complete turnkey vaccine plant. They did not believe Egypt could/would be in a position to absorb the excess production from such a new facility.

Pharmaceutical producers had a similar rationale, but indicated some receptivity to a repackaging rather than full cycle production plant if properly financed. No American firm, during the course of the study, was willing to do more than participate to a limited degree in the feasibility and pre-investment studies necessary to obtain funds for Egyptian units. They were not amenable to investing capital from their own cash reserves or resources. However, many indicated interest in participating in such studies and/or possible joint ventures providing their capital involvement was limited, and personnel resources would not be strained or drawn away from their primary production units outside Egypt.

Some interest was received from one primary American-headquartered feed and production corporation. At the project's end, discussions were still underway through which pilot operations would be developed jointly with GPC. However, restrictions imposed by Egyptian Government regulations had so far inhibited development of an acceptable working arrangement which would assure the American firm of sufficient business volume at least to recover its costs.

Finally, many of the supporting elements found in successful poultry industries either do not exist in Egypt, or are in extremely short supply. Items such as Feed Analysis Laboratories, Diagnostic Laboratories, Bulk Handling Systems, Market Reporting and Management Information Systems are essential tools which poultry production managers must have available if productivity goals are to be achieved. Viable data on the national poultry sector in Egypt simply did not exist at the start of the project and the data management system for poultry in Egypt made little progress prior to project completion.

In summary, the most important constraints to improved poultry production were determined to be:

- Attitude of key dicision makers and poultry production management. While it is substantially agreed that significant capital shortages exist, substantial improvement is possible through improved management practices.
- Available resource utilization is substantially below levels which should be attained. Much of this is due to the attitudinal situation noted above.
- Poultry diseases; shortfalls of major ingredients and vaccines; obsolete equipment.
- Insufficient application of proven modern poultry husbandry techniques and management practices.
- Lack of centralized control and coordination of sector activities.
- Shortage of capital and cash reserves necessary to institute many of the corrective programs.
- Inadequate Management Information System and Data Standardization and Viability.

C. RESULTS

The results achieved during the two-year period of project operations are substantial. In reviewing Exhibit I-C-1 on the following pages (Outline of Targeted Results - Project Paper, Contract and Actual), it will be evident that the scope of the project expanded considerably from the Project Paper of 1976-77 to the final project results in 1979-80. The poultry sector of any country is an extremely dynamic industry. It is impacted by, and has significant impacts on, many sectors of a nation's economy. This is particularly true in a developing country such as Egypt.

While the initial project outline concerned primarily the Village Sector and the General Poultry Company, as the project progressed through its initial stages, it became quite evident that other sub-sectors had considerable impact upon these two major elements of the poultry sector. All were significantly interwoven with each other; so much so that it would be impossible to accurately assess only parts of the national poultry sector without consideration of all major elements. The project was therefore expanded to include all elements impacted by, or having impacts upon, the poultry sector.

Three major elements had not been specified in the initial project outlines. These elements included the feed situation; poultry health problems; marketing and distribution as well as relevant economic factors inhibiting sector development. Subsequent investigations identified each as a major constraint to improved poultry production and high quality protein food availability in Egypt.

Specific details of project findings and results are contained in the many regular and special reports produced during the project. These reports are listed as Exhibit I-C-2 at the end of this section. A summary of principal results is listed below:

- At the time of project startup, a consolidated report of poultry production from all sectors of Egypt did not exist. The first such report and analysis was produced in January 1979, and was updated periodically throughout the project. It provided the basis for all subsequent analysis and recommendations made within and as a result of this project.

- An analysis and inventory of all poultry production facilities, capacities and supporting elements such as breeder farms, feed mills, veteriniary stations, etc., did not exist prior to the start of the project in a centralized, interfaced structure. This was completed for the first time in this project.

- A comprehensive graphic illustration of how each element was involved in the poultry sector of Egypt did not exist until it was developed by the project team. This flow chart provided part of the basis for design of the econometric model of the Poultry Sector, and it served as the basis for micro and macroeconomic analysis of the sector.

- Every GPC production facility, each large private sector producer, a sampling of the smaller private sector producers, and a significant sampling of 181 Village Flocks in 63 villages in all areas of Egypt were visited and assessed concerning poultry production in Egypt.

EXHIBIT I C 1 - COMPARISON OF TARGETED RESULTS

Project Paper, Contract, Actual

PROJECT PAPER	MATHTECH PROPOSAL	ACTUAL EFFORTS/WORK BY MATHTECH PROJECT TEAMS
•SECTOR ANALYSIS/ASSESSMENT	•DEVELOPMENT OF DATA BASE -- ECONOMETRIC/LINEAR PROGRAM MODEL	•DEVELOPMENT OF DATA BASE -- ECONOMETRIC MODEL
	•SECTOR ANALYSIS	•SECTOR ANALYSIS -- TOTAL SYSTEM INFRASTRUCTURE -- POULTRY SECTOR ECONOMICS -- IMPACTS ON NATIONAL RESOURCES •MARKET REPORTING & STABILIZATION PROGRAM
•HATCHERY EXPANSION (FAYOUM, SAKHA, INSHASS)	•DEVELOPMENT OF SPECS •COORDINATION OF BID SPEC CONFORMANCE •COORDINATION OF U.S. EFFORTS	•DEVELOPMENT OF SPECS •COORDINATION OF U.S. EFFORTS
•BREED & HATCHERY IMPROVEMENT	•BREED EVALUATION & ASSESSMENT •HATCHERY ASSESSMENT	•BREED ASSESSMENT •HATCHERY ASSESSMENT •ALTERNATE PLANS FOR IMPROVEMENTS •BREED PERFORMANCE TEST PROGRAMS
•NATIONAL PLAN FOR POULTRY VACCINES & PHARMACEUTICALS	•EGYPTIAN MANUFACTURE & SUPPLY OF POULTRY VACCINES & PHARMACEUTICALS •IMPORTATION & EXPORTATION OF POULTRY VACCINES & PHARMACEUTICALS	•ASSESSMENT OF LOCAL MANUFACTURING FACILITIES & PRODUCTS •ASSESSMENT OF REQUIRED SUPPLY •ASSESSMENT OF IMPORTED SUPPLY QUANTITIES & CATEGORIES •IMPACT ASSESSMENT OF VACCINE & PHARMACEUTICAL SITUATION ON PRESENT POULTRY HEALTH •UTILIZATION •DISTRIBUTION OF VACCINES & PHARMACEUTICALS •U.S. COMPANY INTERESTS •POULTRY HEALTH PLAN •REQUIRED IMPACT PROGRAMS TO IMPROVE MORTALITY/PRODUCTION OF EGGS & POULTRY MEAT

EXHIBIT I C 1 - COMPARISON OF TARGETED RESULTS

PROJECT PAPER	MATHTECH PROPOSAL	ACTUAL EFFORTS/WORK BY MATHTECH PROJECT TEAMS
•VILLAGE FLOCKS	•VILLAGE FLOCKS -- CO-OPS	•VILLAGE FLOCKS •NATIVE HATCHERIES •PURCHASE OF EGGS & DAY-OLD CHICKS AND DISTRIBUTION/MARKET OF EGGS & POULTRY MEAT •CO-OPS •DONOR GROUPS •EXTENSION/VET SERVICES •PROPOSED VILLAGE FLOCK PILOT PROGRAM
•GENERAL POULTRY CO. (GPC)	•GPC (PUBLIC SECTOR) •PRIVATE SECTOR (INDEP.PRODUCERS) •AGRARIAN REFORM	•GPC •PRIVATE SECTOR -- INDEPENDENT PRODUCERS -- GOVERNORATE PROGRAMS •AGRARIAN REFORM •ORDEV •FOREIGN INVESTMENT
		•FEEDS AND FEEDSTUFFS •GRAIN IMPORTS/FEEDSTUFF IMPORTS •LOCAL SUPPLIES/SHORTAGES •MILLING: CAPACITY & CONDITION •FORMULATIONS/QUALITY CONTROL •IMPACT ON PRODUCTION OF EGGS & POULTRY MEAT
(TRAINING)	•TRAINING PROGRAMS -- MOA -- GPC	•TRAINING PROGRAMS -- MOA -- GPC -- ORDEV -- AGRARIAN REFORM

EXHIBIT I C 1
Page 2 of 2

SECTION I - EXECUTIVE SUMMARY

- Market flow of all essential ingredients used in poultry production, and of poultry product distributed from all subsectors, were identified, traced and analyzed.

- Poultry health problems were identified as a major constraint to increasing poultry production in Egypt, with organizational and national poultry health programs developed.

- Identification was made of the existing shortfalls of poultry vaccines with which poultry diseases may be controlled and treated. A major item in this regard was identifying the immediate need of 100,000,000 additional doses of Newcastle vaccine and 11,000,000 additional doses of other vaccines just to satisfy current needs.

- The team identified the problems faced by the AHRI vaccine production facility in producing adequate quality and quantity of necessary vaccines. Short and long-range corrective programs were developed.

- Actual rather than supposed problems facing improved productivity in the Village Flocks were identified.

- Pilot, short and long-range programs were developed with real opportunity to correct the problems of deficient productivity in the village flocks. (Projects Expedite and Vilpro)

- The supposed superiority of native breeds over other breeds were investigated, and the non-existance of supportive data was identified.

- Proposed programs of breed testing on an initial and continuing basis were established to provide valid data on which to make appropriate breed decisions.

- Relatively inexpensive programs were identified which could almost double the supply of disease-free stock to village flocks.

- The project team investigated the viability of the operational concept of the 5000-year-old design and methodology used in the native hatcheries. and their importance to the village sector was recognized. The team also identified the native hatcheries' needs to fulfill their vital role in support of traditional production practices.

- The inadequate staffing, budget and existing capabilities of the Extension and Veterinary Services in support of village production were identified as being a result of insufficient capital availability.

- Identification of the lack of an essential SPF farm necessary for the production of Pullorum free eggs used in adequate quality vaccines used for disease control.

- The team identified the needs for feed analysis labs, disease diagnostic labs, and other laboratory capabilities within Egypt.

- A plan was developed for breed and hatchery improvement in Egypt which could result in substantial improvement in disease free, genetically appropriate poultry strains.

- The team identified the true nature of deficiencies; causes and effects of problems; the feed situation was identified as one of the major constraints to poultry production in Egypt. A Feed Optimization Program was developed through which utilization of existing feed resources could be improved by up to 40 percent over current utilization. Long-range program recommendations were also developed.

- A revised purchasing program for maize was developed and submitted which could improve the cost-effectiveness of current major maize purchases by up to 30 percent.

- Identification of feed formulation and milling problems which have a major negative impact on effective feed utilization was accomplished; recommendations were made for practical corrective programs; and an interest was developed with a major U.S. feed producer to assist Egypt in overcoming some of its feed program deficiencies.

- Data collection and management information systems were analyzed and corrective programs recommended.

- More data concerning the poultry sector was collected and centralized than previously existed. Data sources were visited to establish the viability of data supplied.

- A compendium of data acquired was produced and previously supplied the MOA.

- The flow and interrelationship of all factors impacted by, or on, the poultry sector was traced and graphically illustrated.

- Comprehensive price elasticity studies of poultry product and consumer income were completed.

- The basic design of an econometric model of the Egyptian poultry sector was completed. The operating model of the General Poultry Company Sector was completed and used in trial runs on resource utilization. The results were used as the basis for revised five and twenty-year programs.

- Recommendations made by the team have been used as the basis for the MOA's five and twenty-year development plans concerning poultry and related elements. These recommendations have also been submitted to the Peoples Assembly for their use in formulating future Egyptian policy and law concerning Food Security Programs.

- Poultry production by GPC and the private sector was estimated to have increased by 84 percent during the final year of the project. It is believed much of these increases came as a result of the extensive consultancies to the poultry sector provided during this project.

- GPC switched from use of one nationally supplied strain of broilers to an American-supplied strain whose productivity was almost twice as much as the original strain.

- Major recommendations were made regarding the excessiveness of custom duties and fees on certain critical imported materials used in poultry production. It is believed that as a result of these strong recommendations, those duties and fees have been or were to be removed. These costs were considered to be major constraints to the development of the private production sector, and they placed undue burdens on private sector producers.

- The first comprehensive plan for the improvement of poultry sector production and the resolution of its major problems was developed and supplied to the Minister of Agriculture.

- A Study of the market supply demand situation was completed and provided the basis for a Market Stabilization Plan submitted to the MOA.

- A comprehensive study was made of the slaughterhouse-refrigerated storage-poultry distribution situation in Egypt, and a plan was developed whereby constraints to problems in such areas could be rapidly and economically overcome.

- A program designed to resolve the problems encountered by rural producers, both commercial and village level, was developed and provided.

- Specifications for the expansion of the three MOA breeder farms were developed and supplied to the MOA.

- Seventy managers and technicians in Egypt's poultry sector were processed through a comprehensive management development program in the United States, and were exposed to the most modern poultry practices and operations available in commercial units and research centers as applicable. In many instances, significant changes in their attitudes and practices were evident upon their return to Egypt. Typical examples of this change were improved acceptance of the use of open housing and breed testing programs, both of which were almost totally rejected at project inception.

- Comprehensive recommendations and the genesis of a National Poultry Plan were developed and submitted to the MOA and to USAID-Egypt.

- The project team provided extensive consultancies throughout the Egyptian poultry sector. This fact is evidenced by the actual number of person-days of consultancies applied (5345) versus the initial number projected in the Project Paper (2500).

- Various regular and special reports and documents were produced, as listed on EXHIBIT I-C-2 on the following page.

D. CONCLUSIONS

The problems facing the Egyptian poultry sector are significant, but not insurmountable. They pose an extremely difficult challenge which must be overcome if the poultry sector is to fulfill its role in supplying the majority of the high quality protein food essential for adequate human nutrition.

Egypt's current resources are not sufficient to overcome the major problems without outside assistance, and without a strongly disciplined program to maximize all available resources. Careful planning and resource utilization will be essential if the goals of Egypt's Food Security Program are to be attained.

Many of those in key positions which impact the poultry sector are capable and dedicated to achieving those goals. And there are a goodly number of similarly capable and dedicated people throughout the relevant infrastructures. However, there are also many whose technical and management skills have not yet been developed to the point

POULTRY IMPROVEMENT PROJECT

COMPENDIUM OF REPORTS

SPECIAL REPORTS

TITLE	DATE
Preliminary Interim Report	December 12, 1978
Preliminary Organizational Structure Of the MOA	December 15, 1978
Breeder Results	January 1979
First Consolidated Comprehensive Poultry Production Report	January 3, 1979
Junior Level Training Program	January 27, 1979
First Interim Report (2 volumes)	February 5, 1979
Poultry Vaccine Specifications	February 1979
Comprehensive Poultry Industry Requirements	March-April 1979
Cost Benefit Analysis - Poultry Sector Programs	March 4, 1979
Hatchery Improvement and Expansion	April 17, 1979
Comprehensive Preliminary Sector Project Budget Forecast - National Poultry Plan	April 4, 1979
Commodity Specifications - Vehicles	April 1979
Comparative Results Of Open vs. Closed Housing	May 1979
Poultry Sector Organization and Flow Chart	May 1979
Poultry Health Situation In Egypt	May 9, 1979
Revised Organizational Structure Of the MOA	May 1979
Animal/Poultry Health and Vaccine Production	June 19, 1979
Background Paper - Project Expedite	June-July 1979
Feed Situation In Egypt	July 1979
Commodity Specifications - Buildings and Equipment	July 12, 1979
National Poultry Health Improvement Program	July 1979
Training Program - Analysis To Date	August 1979
Special Report and Revisions, Management Training Program	September 6, 1979
Price Elasticity Studies - Egyptian Consumer Market	September 1979
Second Interim Report (3 volumes)	November 9, 1979
Project Evaluation Report	December 18, 1979

POULTRY IMPROVEMENT PROJECT - COMPENDIUM OF REPORTS (Continued)

TITLE	DATE
The Corn Situation - I	February 1980
The Place and Need Of Poultry In Egypt	March 1980
Profiles For Breed Teses - GPC, ORDEV, AHRI	March-April 1980
Feed Optimization In Egypt	March 14, 1980
Design and Rationale - Arochic; Poultry Sector Econometric Model	March 1980
Market Stabilization and Management Program	March 14, 1980
Production, The Private Sector and Village Flocks	March 14, 1980
U.S. Industrial Interest In Egyptian Poultry Sector	March 25, 1980
Revised Commodity Specifications - Vehicles	April 1980
Data Manual	April 18, 1980
Compendium Of Reports (2 volumes)	April 24, 1980
Project Briefing Manual	April 24, 1980
Special Report For the Peoples Assembly	April 1980
Revised Commodity Specifications - Buildings and Equipment	May 1980
Summary Of Poultry Improvement Project	May 2, 1980
Background Paper: Project Vilpro/Expedite	May 2, 1980
Hatchery Expansion	May 29, 1980
Comprehensive Preliminary Recommendations	May 30, 1980
The Place Of Poultry In Egypt	June 1980
The Egyptian Poultry Industry	July 1980
The Corn Situation - II	July 1980
Special Project Summary	August 7, 1980
Final Report	September 1980

MONTHLY PROGRESS REPORTS

1.	September	1978	9.	May	1979	17.	January	1980
2.	October	1978	10.	June	1979	18.	February	1980
3.	November	1978	11.	July	1979	19.	March	1980
4.	December	1978	12.	August	1979	20.	April	1980
5.	January	1979	13.	September	1979	21.	May	1980
6.	February	1979	14.	October	1979	22.	June	1980
7.	March	1979	15.	November	1979	23.	July	1980
8.	April	1979	16.	December	1979	24.	August	1980

where their contributions supplement actions to achieve those goals. In many cases, these deficiencies in technical and management skills are counter-productive to the results essential for success. Improvement in these areas can only be accomplished through additional training, technical assistance and time. Therefore, continued technical assistance programs will be required through the foreseeable future.

Obviously, Egypt must use to the optimum its existing resources in material, personnel and operational budget to achieve the best possible results. Key personnel cannot be absent from responsibilities for any extended periods of time, for purposes of adding to their experience and job performance capabilities. There simply is not enough key personnel depth at this time to afford such luxuries. Therefore, a major need essential to Egypt's objectives, in addition to continued technical assistance, are management development programs for various levels of poultry and agricultural development. These programs must combine short term training in comparable positions in the United States, and a well structured follow-through and on-the-job-type, in-country training (OJT) in Egypt to achieve the necessary results.

The objectives concerning the poultry sector in Egypt's Food Security Program are believed attainable with proper and effective utilization of resources. That will be a massive undertaking. In order to fulfill the initial objective of 8 kilos of poultry product per person per year for its current population, Egypt must more than double its current national production. Considering the projected increase of an almost doubled population by the year 2000, another doubling of production, or a quadrupling of current production, will be required. Considering Egypt's present shortage of available resources, those increases pose a mountainous challenge!

Needs relating to facilities, equipment, and most production inputs to achieve such goals are primarily capital intensive. Many of those needs can be fulfilled through careful utilization of cash reserves, others can be filled by cash flow generated from international trade and acquisition of funds from donor and international banking sources. However, all must be carefully applied.

A comprehensive financial program must be developed, regularly monitored, and carefully managed throughout. Unfortunately, planning and management of that nature was not particularly evident during this study. Tools such as the Econometric Model of the poultry sector (developed during this project) and technical assistance from outside Egypt must be utilized to overcome such deficiencies and assure the optimum utilization of available resources.

A major and most critical item is predicted to be feed ingredient supply and formulation, particularly the availability of maize. Since Egypt does not possess the existing capability to grow all the maize it needs, as well as other crops, it must import large quantities. While to a degree the availability of much larger amounts of hard currency would seem to resolve that problem, the quantities required escalate to a point where such availability becomes even more burdensome than it is now. We do not believe donor funds will be available indefinitely in whatever quantities required. Other solutions must be sought, identified and implemented.

First and foremost, improved utilization of current maize resources must be achieved. Much improvement can be realized with relatively modest capital investment. This improvement can be achieved by application of the Feed Optimization Program developed and submitted during this study. Delays in actuating such programs will only compound Egypt's problems. Improvements of up to 40 percent are available through application of those or similar programs.

Egypt currently imports large quantities of fishmeal for poultry rations. Many large poultry producers in the United States and other developed countries no longer use fishmeal because of its expense, occasionally poor availability, and importation requirements. They have reformulated rations to eliminate its need. Were Egypt to do so, funds used for importation of fishmeal could be diverted to other essential ingredients such as maize.

Solutions to the major availability problems of feed ingredients do not appear attainable simply by importing larger quantities, or by increasing the production of maize. Sufficient areas of arable land simply do not exist in Egypt, nor will

land reclamation fill that need in the foreseeable future. Improvements in yield, cropping patterns and multiple crops per year can, of course, be achieved and will help in part to fill the needs. Careful planning must be implemented to optimize such possibilities.

Although improvements in soy bean production had been indicated by Egyptian officials as catching current domestic needs, continued increases must take place to keep pace with the increased production of poultry. It must be recognized that Egypt's currently stated needs do not yet include feed rations for the village flocks which compose 50 percent or more of Egypt's poultry population. However, needs for those flocks can be restricted to the supply of balanced rations for the first 8 to 10 weeks of growout. That practice would bring poultry to a fully grown and more healthy state than currently exists. At that point intakes can be converted to the use of table scraps. A program of this nature should improve village flock livability and productivity.

Egypt must embark on an accelerated program of research and improved management of all ingredients which are, or can be, utilized in animal feeds. Since many of those ingredients are also used for human nutrition, the comprehensive management program should start with an improved cropping plan and patterns; then proceed to improved allocation of ingredients to the sector(s) which will produce the greatest benefit for the economy and Egypt's population. There are undoubtedly ingredients not now used in Egypt, which can be substituted for the primary protein in poultry rations, notably maize, soy bean meal, and fishmeal.

Egypt must develop and implement a program wherein all relative aspects of meat protein food alternatives are centrally monitored and interfaced for maximum effective use. This program should include all meat options such as fish, poultry, eggs and red meats, dairy products, and all major inputs necessary for their production. A comprehensive plan must be developed and managed efficiently to determine on a regular basis the cost-benefits derived by allocation of resources to each major item involved.

The population/food table depicted Exhibit I-D-1 and 2 (on the following pages) show various rates of increase in food production versus various rates of population

EXHIBIT I D 2

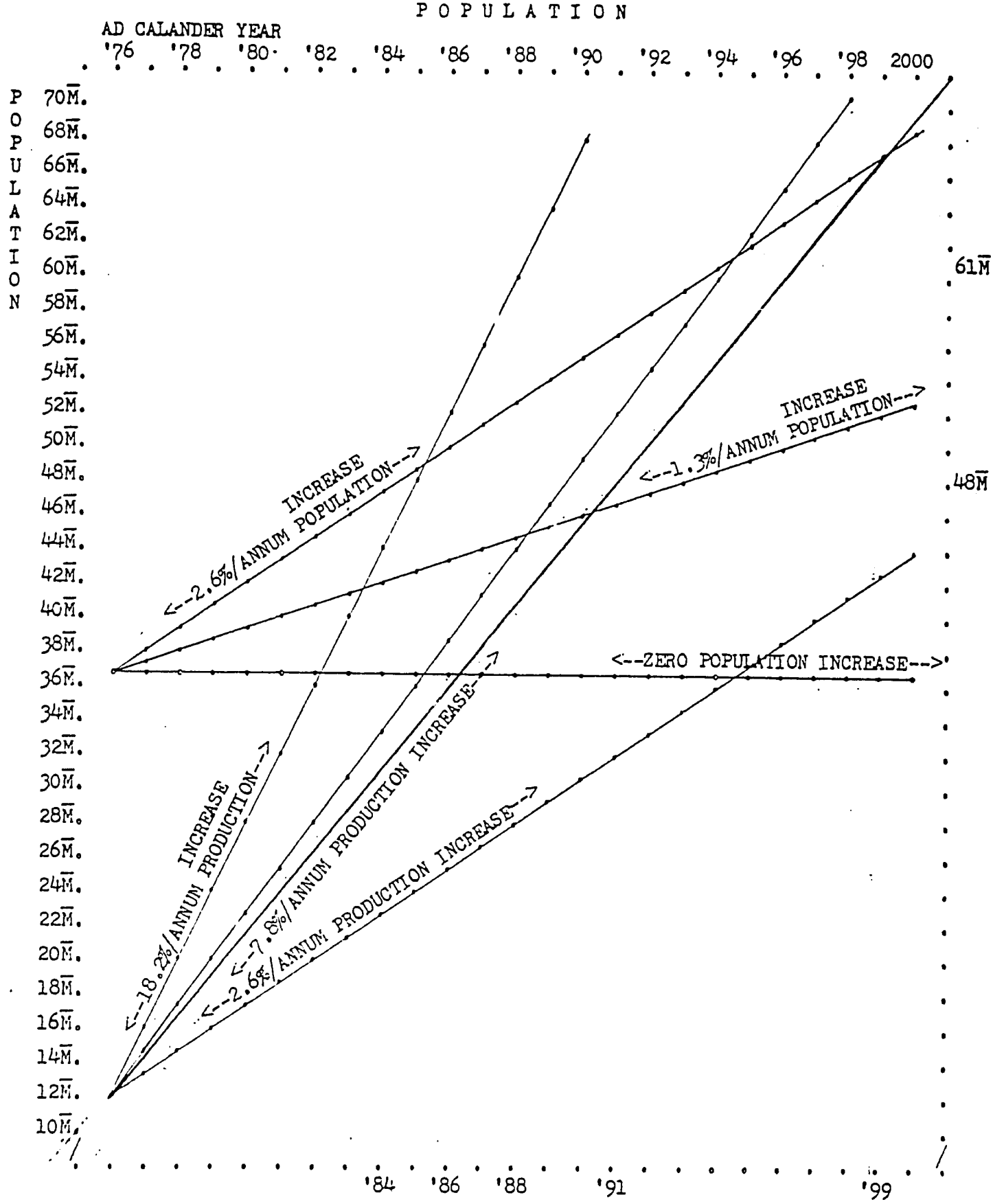
P O P U L A T I O N / F O O D
T A B L E
E G Y P T

AD YEAR	0.5X INCREASE/YR @ 1.3 % POPULATION	1.0 X INCREASE/YR @ 2.6 % POPULATION	3 X INCREASE/YR @ 7.8 % FOOD	4X INCREASE/YR @ 10.4 % FOOD	5X INCREASE/YR @ 13 % FOOD	6 X INCREASE/YR @ 15.6 FOOD	7 X INCREASE/YR @ 18.2 % FOOD
1976	36,803,180	36,803,180	12,267,726	12,267,726	12,267,726	12,267,726	12,267,726
77	37,281,621	37,760,062	13,224,608	13,543,569	13,862,530	14,181,491	14,500,452
78	37,766,282	38,741,832	14,256,127	14,952,100	15,664,658	16,393,803	17,139,534
79	38,257,243	39,749,110	15,368,104	16,507,118	17,701,063	18,951,236	20,258,929
80	38,754,587	40,782,586	16,556,816	18,223,858	20,002,201	21,907,628	23,946,054
81	39,258,396	41,842,933	17,859,027	20,119,139	22,602,487	25,325,217	28,304,235
82	39,768,755	42,930,849	19,252,031	22,211,529	25,540,810	29,275,950	33,455,605
83	40,285,748	44,047,051	20,753,689	24,521,528	28,861,115	33,842,998	39,544,525
84	40,809,462	45,192,274	22,372,476	27,071,766	32,613,059	39,122,505	46,741,628
85	41,339,985	46,367,273	24,117,529	29,887,229	36,852,756	45,225,615	
86	41,877,404	47,572,822	25,998,696	32,995,500	41,643,614	52,280,801	
87	42,421,810	48,809,715	28,026,594	36,427,032	47,057,283		
88	42,973,293	50,078,767	30,212,668	40,215,443	53,174,729		
89	43,531,945	51,380,814	32,569,256	44,397,849			
90	44,097,860	52,716,715	35,109,657	49,015,225			
91	44,671,132	54,087,349	37,848,210	54,112,808			
92	45,251,856	55,493,620	40,800,370				
93	45,840,130	56,936,454	43,982,798				
94	46,436,051	58,416,801	47,413,456				
95	47,039,719	59,935,637	51,111,705				
96	47,651,235	61,493,936	55,098,417				
97	48,270,701	63,092,778	59,396,093				
98	48,898,220	64,733,190	64,028,988				
99	49,533,896	66,416,252	69,023,249				
2000	50,177,836	68,143,074					

EXHIBIT I D 2

EXHIBIT I D 1

EGYPT
OPTIONS GRAPH
PRODUCTION
POPULATION



increase. At the current 2.6 percent annual rate of population growth, the charts indicate that a 7.8 percent annual rate of increase in production would be necessary if the per capita consumption of poultry products is to be tripled by the year 2000.

If the objective of providing the 12 kilos per person per year is to be achieved in less than 20 years, then the annual rates of increase in poultry must be increased accordingly. As an example:

- If the 12 kilos are to be provided in 11 years, poultry production must be increased at an annual rate of 10.4 percent.
- If to be provided in 8 years, poultry production must sustain an annual rate of increase of 13 percent.
- To attain those goals in 6 years, poultry production must increase by 15.6 percent annually.
- And, to attain such goals by 1985, poultry production must increase annually by 18.2 percent.

Obviously, among the variables, the rates of increase of population and production are the key factors. Most significantly, the rate of increased production must triple the rate of increase in population.

While the annual rate of increase in confined-unit broiler production has averaged 11 percent since 1976, those units consist of less than 50 percent of poultry meat production in Egypt. The balance is produced in the village flock sector. Therefore, the current annualized national rate of increase is only approximately 5 percent.

The annual rate of increase in confined table egg production, up to the end of 1978, was approximately 22 percent annually. However, commercial egg production is less than 10 percent of Egypt's production with the balance being produced in the village sector. Therefore the annualized rate of production of table eggs has increased by less than 2 percent. Combined with the annualized rate of increase in poultry meat, the total annualized rate of increase is less than 7 percent, or below the 8 percent rate annually required to achieve the desired objective by the year 2000.

At this point, it must be recognized that higher rates of improvements are normally experienced during the early stages of a program, and are much more difficult to achieve over time. Also, the availability of resources on a continued and increasing basis (considering inflation and other factors), will create continuingly increasing problems in the later stages of such programs. Problems in quantity and quality of feed ingredients and rations, therefore, appear to be the single most significant constraint outside of resource utilization and capital availability.

Hatchery capacity and productivity are factors which can be overcome through increased capital expenditure, improved management, and use of strains of poultry more productive than those used in the village sector. Expenditures for capital improvement of capacity in th MOA farms (supplying the village sector), would be more effectively utilized if applied to the necessary re-engineering and balancing of throughput equipment (such as laying pens, etc.). Existing commercial and GPC hatcheries could also be utilized to a greater degree to satisfy village sector and native hatchery needs.

An immediate disease control program by the central government and governorates would significantly improve productivity in the village sector. The prohibition of the use of recycled fertile village eggs, and the supply of disease-free stock to the native hatcheries could be effective without major capital investment. These practices could be implemented on a governorate-by-governorate basis until sufficient personnel and disease-free eggs were available for the entire sector.

The major allocation of available donor funding should be applied to the resolution of the problems besetting the village sector. Such application would provide the greatest benefit to the largest number of the people of Egypt, especially the rural poor. However, such programs will require somewhat lengthy periods of time to develop, test, refine, implement, and to rebuild an appropriate supporting infrastructure. In the meantime, short-range, immediate action programs recommended herein should be implemented at the earliest possible time to alleviate as many of the existing problems as possible.

SECTION I - EXECUTIVE SUMMARY

Poultry Health and Disease Control Programs are urgently needed. While improvement in management practices would, of course, be beneficial, for these programs to be successful they must have sufficient quantity, quality, and types of vaccines. Unfortunately, no more than 15 percent of the current needs of the village sector are now being supplied by Abbasia with questionable and varying quality. Therefore, until a new vaccine plant can be constructed to replace Abbasia, immediate efforts must be applied to provide realistic but limited improvements to the facilities and practices at the existing Abbasia vaccine production unit. Abbasia's needs are too extensive, the facility is basically obsolete, and would require more funding and time to effect the necessary complete renovation than would a new facility.

The private sector, other than in the village flocks, produces no more than 25 percent of the poultry meat consumed in Egypt and less than 2 percent of the table eggs. Conditions do not yet exist wherein the private sector has a reasonable opportunity for adequate profit and return on investment. Therefore large scale private sector involvement has been minimal and erratic. Under such circumstances, the public sector (particularly GPC), has had to bear an excessive burden in supplying poultry products to the Egyptian population. These conditions must be changed so that the capabilities and resources of the private sector can be brought to bear in the struggle to achieve Food Security objectives.

While it would appear that conversion of GPC to private enterprise would be a major step in achieving that goal, at the current time there is no capability available in Egypt's private sector to replace GPC. Because of the key position GPC occupies in Egypt's poultry sector at the current time, Egypt can ill afford such a change other than on a disciplined, well controlled changeover. Should such a changeover result in even a temporary decline in GPC's production, the impact on the population could be disastrous. Therefore, a well designed and managed program of converting GPC to private enterprise will be essential if GPC's conversion to private enterprise is to be successfully accomplished.

It would appear that foreign investment in the sector could provide many necessary answers. However, most such potential investors approached were highly reluctant to be involved in any manner other than as a pure, cash-on-the-barrel-head-supplier. While a limited number indicated possible interest in further involvement, they very specifically stated they would be interested only if certain questions regarding feasibility were first resolved. And then they do not wish to be required to invest

capital from existing cash reserves. In other words, involvement must be financed in a way which would not detract from their current financial status or impact their existing resources in any way. It is their belief the risk is still too great.

Through a study of funding available from various sources, it is believed programs such as those indicated by interested firms are possible. They must be carefully and delicately developed and implemented from funds available from sources such as OPIC, AID funded Development bank programs, various IBRD programs, the UN, and various other development bank and donor agency programs. Although many such resources exist, there currently is no clearcut path for organizing programs by which necessary funds can be readily obtained. If availability can be more clearly defined or improved, it is believed that foreign investor inputs can be developed which would be beneficial to all concerned.

Although Egypt has been an agricultural leader over many centuries in areas such as production per unit of land and multiple cropping, much of its Agriculture does not utilize improved modern technology. Resolution of its problems will require input of this modern Apricultural technology from outside Egypt, therefore particularly concerning poultry. Advances in poultry production have been made by increasing efficiencies within poultry sectors, which has allowed for either greater production at the same cost and resource utilization...or the same production with less cost and resource inputs. Merely continuing to perform at the same efficiency levels on a larger scale would only compound Egypt's problems. We believe greater application of available technology can achieve up to an estimated 20 percent improvement in current productivity without significant capital expenditure. To do so, in many instances, will require a change in attitude of some of the key decision makers in Egypt's poultry and related sectors.

One of the changes in attitudes concerns the current overapplication of inexpensive labor. In many instances, such as with GPC, because of the national policy concerning educational objectives of the government, excess and often insufficiently skilled labor is involved in the production and management processes. While the objective of providing jobs is a good one, in many of the instances involved with poultry production, it has had a strongly negative effect. This is not to say that the team recommends automating Egypt's poultry sector. To the contrary, in many instances we believe there has been too much automation for the sector's capability to maintain

such installations at the necessary operational levels, and an over-reliance on automation.

The primary point is that considering the relative importance of increased poultry production, the use of such labor should be confined to instances wherein such does not create negative results. The same applies to automation...it should not be used only as a showcase. Rather, it should be used only when all relevant factors would result in improved productivity.

Many who received training in the United States during this project found that although the U. S. Poultry Industry is the world's most productive, its facilities and operations were not necessarily showcase operations, nor were they significantly labor or automation intensive. Different installations used different combinations of inputs to achieve the best possible outputs under the combinations of circumstances involved in each. The application of such methodology would yield improved results and resource utilization in Egypt, but will require further changes in Egyptian attitudes to be effective. This is particularly true regarding housing, automation, and environmental situations.

In summary, the team concludes that Food Security objectives are achievable; but only if a comprehensive, sufficiently detailed, monitored and managed program is developed. That program should include all meat option foods and major ingredients. Sufficient funds should be available from various sources outside Egypt which, in combination with Egypt's own capital fund availabilities, should be sufficient to achieve its goals.

E. RECOMMENDATIONS

1. INTRODUCTION

The purpose of this section is to provide, in a consolidated form, the considered recommendations of the Poultry Improvement Project Team regarding the current status and future needs of the Poultry Sector of Egypt. Many of these recommendations have previously been outlined in the Special Reports on various poultry subsectors submitted during the 24 months of this project. This document interrelates and updates those.

One of the Egyptian Government's major nutritional objectives, as stated by President Sadat, is to overcome the significant shortfall in the supply of high quality protein food available to the Egyptian population. An adequate amount of such protein is considered essential by human nutritionists and health experts for the normal development and maintenance of physical and mental health. The generally accepted worldwide standard for human intake of such high quality protein is 12 kilograms per year. The latest and most reliable figures available indicate that average per capita consumption of such protein in Egypt is approximately 4 kilograms per year, or only one-third the recently stated necessary amount for good health. The goal of President Sadat is to overcome the existing deficiency by the year 2000, making diligent progress within an optimistic timeframe of five years, or 1985. Half of the 12-kilo objective (or 6 kilos) is to be derived from poultry. However, only 2 kilos are currently supplied by poultry.

If such a goal is to be reached, the significant shortages and resource deficiencies now existing must be overcome, and optimum use must be made of the resources now available. The recommendations contained in this document are intended to promote the achievement of those objectives in the most realistic and cost-effective manner possible.

It is generally acknowledged that poultry production is the quickest, most cost-beneficial way to increase the availability of high quality animal protein food. Within the range of poultry products, broiled (chicken) meat

and table eggs are the most resource and time-effective products. Therefore, most recommendations focus on improving the production of broiler meat and table eggs. It should be noted, however, that the recommended programs will positively impact all poultry activities, and likely will also benefit the livestock, dairy and primary animal feed/human food ingredient sectors to a significant degree as well.

This segment of the report is organized into three major sections: Introduction, Program Recommendations, and General Details of the Recommendations. The budget estimates are based on a general knowledge of costs and on the costs of previous programs, rather than on a detailed analysis of all possible cost factors. However, we believe that the cost estimates provided in this report are more than adequate for initial planning purposes.

Three primary cost categories are considered throughout, and are identified in the budgets projected on the fold out charts on the last pages of this section.

* TECHNICAL ASSISTANCE, TRAINING & PROJECTS - Includes all items which might possibly be funded from sources such as AID. Wherever practical, the estimates also include amounts budgeted for equipment purchases and/or commodities too small to be included or funded from other sources, but which are otherwise essential for successful project completion.

* COMMODITIES - Include feed, vaccines, and other items which would fall into funding categories such as those used by the AID-CIP program.

* CD/DB TYPE FUNDS - Includes funds used for capital development activities such as those supported by AID-CD, World Bank, and other sources. These funds would be used for major equipment purchases, facilities, and plants.

In reviewing the requirements for the latter two categories, it is obvious the budgeted levels are substantial. Therefore, when reviewing these

recommendations, the reader should bear in mind that a significant portion of such fund requirements may become available from the continuing operational budgets of the Egyptian Government units involved, or from many other funding sources such as AID-CIP/CD funds, the Development Banks, or the World Bank. As is the case in all operational units involved in poultry production, they must provide consumable items such as feed rations, which usually comprise 60% or more of total costs. Therefore, for the sake of realistically assessing the cost impact of supporting the activities required to achieve the stated national goals, the reader should concentrate on the Technical Assistance, Training and Projects budget estimates, rather than on the Commodity and CD/DB categories.

One will note the emphasis upon the on-site technical assistance and the training of Egyptian management personnel (public and private) components in this report. While there are many well qualified Egyptian personnel in the Poultry Sector, their number is not nearly sufficient to accomplish the stated objectives. And even among those who are properly qualified, deficiencies exist in their levels of current technical knowledge and modern operational techniques which cannot be overcome with short-term training.

Much of the required training can be provided only in an on-the-job context, which should supplement the out-of-country training and in-country seminars. Assistance and upgrading in the technique of effective operational decision-making can best be given at the decision-making point. Therefore, we believe any program should include a substantial amount of on-site, in-practice technical assistance, as well as a variety of operationally (rather than institutionally) oriented training programs. We firmly believe these elements are essential not only to the effective achievement of the stated goals, but also for the most efficient use of the vast sums of commodity and capital expenditures required to achieve the stated goals.

Exhibit I-E-1 on the pages following, contains a summary of benefits which are anticipated to have been received at the conculsion of the first year program outlined in this section. The achievement of such benefitsis, of course, dependant upon timely implementation and coordination of these programs shortly after the conclusion of this project. Benefits would be somewhat modified and perhaps even somehat diluted if an extended delay occurred between the end of the PIP and the startup of the recmmended programs. Also, it is quite likely the benefits will be considerably more recognizable in the year following the implementation of the recommended programs, than in the year in which the programs were first implemented.

Maintenance of such benefits is quite dependant upon sufficient continuity of effort in the recommended program areas. Most are not "one-shot" type situations and will require continuous effort once the program is initiated. Without sufficient continuity of effort, it is quite likely even the short term benefits will disappear rapidly under the plethora of new problems which are bound to develop in an uncontrolled environment, and in such a dynamic economy as Egypt will no doubt continue to experience in the near future. Also, the poultry industry in Egypt is currently in a dynamic state, and it too is quite likely to continue in such a state for at least the forseeable future.

The key therefore to success, is that once a program is started, there should be a dedication to maintaining continuity of effort and control over the situation. With appropriate controls, continuity of effort, and the application of proven management techniques, future problems will be prevented and a more orderly, rapid growth can be anticipated.

SUMMARY OF FIRST YEAR BENEFITS

The following is a summary of principal benefits projected for the Poultry Sector of Egypt, if the recommendations outlined in this document were implemented in the relatively near future...6 to 12 months. Delays in implementation would, of course, change the benefit ratios because of the many probable changes in the poultry sector likely to occur. Note that this summary does not list all possible benefits, just the most tangible and measurable benefits to be realized. A complete list of benefits is contained in Section IC2, and in Exhibits I-C-2 and I-C-3 in their respective sections of this report.

IMPROVED CURRENT PRODUCTIVE CAPACITY OF DISEASE FREE HATCHING EGGS AND CHICKS: These program elements would resolve the problems created by the native hatcheries using recycled, and most probably diseased village eggs for hatching. It would improve the volume and quality of disease free, genetically superior hatching eggs and healthy baby chicks supplied to the village flock.

- Native hatchery production is estimated at 100,000,000 chicks per year
- Recommended programs would improve their current ratio by 20 percent (or approximately 200,000,000 chickens per year--50 percent male and 50 percent female).

- Improved liveability would increase annual village poultry production as follows:

  10,000,000 broilers @ 1.2 kilos each (12,000,000 kg poultry meat); and
  10,000,000 spent fowl @ 1.5 kilos each (15,000,000 kg poultry meat); or a total of 27,000,000 kg meat with a cash value* of 27,000,000 LE per year.

  10,000,000 layers producing an annual average of 80 table eggs each, or a total increase of 800,000,000 table eggs at a cash value* of 40,000,000 LE.

PROGRAM ELEMENTS REQUIRED: I-1 and I-3 minimum. (See Exhibits I-E-2 & I-E-3)

FEED OPTIMIZATION PROGRAM ELEMENTS:

These programs would concentrate on the coordinated improvement of feed ingredient, quality control, handling and consumption problems. The number of confined birds in Egypt is believed to be more than 72,000,000, most of which are given some type of feed ration (1,400,000 layers; 70,000,000 broilers; and 1,445,000 breeders and other per year). Average feed consumption for a flock that size is estimated at 353,000 metric tons of complete feed ration annually. Based on an average cost of $150/MT the projected 20 percent rate of improvement resulting from this option would represent an additional useable quantity of 70,600 MT/year, or a cash value of $10,500,000 annually. (7,350,000 LE)

PROGRAM ELEMENTS REQUIRED: II-1 and II-4 minimum. (See Exhibits I-E-2 & I-E-3)

POULTRY HEALTH, VACCINE AND PHARMACEUTICAL OPTIONS:

Continued importation of adequate quantities of suitable quality vaccines is the most expensive way to handle the poultry health and disease control problem, especially when the basic capabilities exist within Egypt to fill

* Cash value as of April 1980 market prices.

her vaccine needs. The MOA/AHRI Abbasia plant is obsolete, underequipped, understaffed, and too underbudgeted to perform that function. New facilities are needed but would require a minimum of 2 to 4 years for completion once funding is acquired. As an interim measure, our recommendation is to optimize existing capabilities while spending as little as possible to allow Abbasia to produce an acceptable quality of vaccines at its optimum capacity. As noted in previous special reports on the subject, there is a shortfall of critical vaccines of at least 100,000,000 doses per year, and probably significantly more than that. (For example, Newcastle Vaccine used to treat one of the most devastating poultry disease problems affecting the Egyptian Poultry Sector.) Imported vaccines cost approximately $1.00 more per 1000 doses than locally produced vaccines, or at least twice as much as domestically produced vaccines. Based on the 200,000,000 doses currently available from all sources, this cost difference represents a saving of about $200,000 per year or approximately the estimated amount necessary to perform interim improvements in Abbasia's vaccine production. The 20 percent increase in available doses (if Abbasia were producing at capacity) would represent an additional saving of $60,000 annually. The major improvement to be reached however, is the improved disease control and reduced mortality to be realized from the additional 40,000,000 doses of vaccine which would result from these recommended programs.

PROGRAM ELEMENTS REQUIRED: III-1 & III-3 minimum. (See Exhibits I-E-2 & I-E-3)

2. GENERAL PROGRAM RECOMMENDATIONS

This section contains general recommendations the MATHTECH Team believes will be required to overcome the major problems of the Egyptian Poultry Sector. They are comprehensive in that they address the overall poultry sector and its impact on the entire Egyptian economy and population, especially the poor and rural populations.

There are very strong interrelationships between the various components of the Egyptian Poultry Sector. Currently the public sector's role (GPC and MOA) is essential in providing functional support to the entire poultry sector -- private, rural and public. Until the private sector's capabilities progress sufficiently to permit take-over of the production and support roles, public sector support must be continued and its effectiveness improved to avoid a possibly disasterous impact on the slowly growing private sector and the rural populations. We believe it essential that continuous technical, material and financial assistance beyond the scope of Egypt's current resources be provided at least until 1984, to meet the Egyptian population's current needs for high quality protein consumption.

Because of the many essential interrelationships involved in poultry production in Egypt, our recommendations encompass support to all the appropriate segments of the Egyptian Poultry Sector. The recommended programs are intended to provide the most rapid cost-effective benefits, and at the same time to overcome significant infrastructure deficiencies. While these benefits are being realized by the poultry sector, there will most likely be significant benefits experienced in other major areas. Some of the areas which should be positively affected include red meats, dairy products, cereal grains, feeds, vaccines and pharmaceuticals, and a relative easing of the hard currency requirements for these sectors. We recommend that all future programs address at least some of the problems in these other sectors, since all sectors face a number of common, interrelated problems which require multi-sectoral solutions to achieve the most lasting results.

Exhibit I-C-2 (at the end of this section) outlines comprehensive program recommendations by year for the next five years. It also provides summaries by project and cost category for these recommendations. Of primary interest is the forthcoming year since we strongly recommend continuous technical assistance from developed countries be provided to the poultry sector of Egypt, to prevent severe problems which we believe could result from interrupting the current USAID assistance program.

Program recommendation costs for the first year are estimated to total $11,700,000, in addition to the previously recommended $998,000 for Project VILPRO (Expedite). CIP and CB/DB-type fund requirements are estimated to be $12,500,000 and $4,750,000 minimum respectively, with maximum figures somewhat higher.

At the end of the first year of program implementation, the following benefits are projected:

- Major progress in supplying disease free hatching eggs and baby chicks to the rural section. Improvement potential of up to 20 percent in supplying such chicks and their subsequent maturing into edible poultry meat produced by the village flocks in the rural sector.
- Establishment of a vital network and delivery system to increase the supply of essential vaccines to the village sector. This will serve to control the critical poultry diseases which now impact liveability in the rural flocks up to 50 .
- Stabilization of the wholesale prices received by the private sector poultry producers. (See Special Report on Market Stabilization - March 14, 1980) This stabilization is essential if the private sector is to be allowed to grow and expand into the desired position in the poultry sector. Simultaneously, this program will tend to stabilize retail poultry prices, and thereby make poultry product available to a much larger segment of the Egyptian population.

- A minimum 10 percent improvement in feed utilization, and a minimum 20 percent qualitative improvement in feed quality, should be evident after the first year. This will result in an approximate 20 percent improvement in critical feedstuffs support needs. The primary beneficiaries of such improvements in the feed support system will be the village flocks, and those hatchery/breeder farm systems which support the village flock/rural sector programs. These areas are now experiencing a critical shortfall. Simultaneously, an approximate 10 percent improvement in the costs of feed rations and primary ingredients is projected. At the recent delivered safe-Alex price for maize of 126 LE per metric ton, this 10 percent would have represented an approximate savings of U.S. $13,230,000 for the 750,000 metric tons of maize purchased by Egypt in the calendar year 1979.
- A minimum 20 percent improvement in the quantity, and a more than 50 percent improvement in the necessary quality of vaccines produced in Egypt is anticipated. In addition, the necessary increase in the supply of imported vaccines would be provided primarily to the village/rural sector, and would represent a multifold increase of vaccine availability in areas where there has been a critical shortage in the past.
- An improvement of at least 15 percent in the productivity ratios now experienced by GPC. This increase should be sufficient to overcome deficits such as the approximate 4,000,000 LE deficit in GPC operations during the calendar year 1978.

In addition to the above measurable benefits, the following should also be evident during this first year:

- Establishment of feed inventory and formulation programs available for use by the entire poultry sector of Egypt. These programs should result in optimum use of local ingredients, and the formulation of better-balanced poultry rations at the lowest possible cost to the poultry sector.

- Establishment of in-country capabilities for poultry disease diagnosis and feed ingredient/ration analysis. These programs are essential for effective disease control and feed optimization. There also would be a significant reduction in, or complete elimination of the purchase, receipt, and use of feed ingredients which do not meet specifications and/or poultry nutritional requirements. There currently is extremely limited inspection and quality control of feed ingredients as well as imported vaccines and pharmaceuticals. The team believes this results in such imports being received at less than desireable specifications.
- The development and testing of corrective programs to improve sanitary conditions in the native hatcheries, to minimize poultry disease transmission in the village flock sector. These programs would include development and testing of practical ways to improve the delivery systems of veterinary/extension services, and to increase the amount of vaccines/pharmaceuticals and poultry rations available to the rural sector. Such achievements would favorably impact the MOA Veterinary/ Extension Services, the governorate programs, and other support elements to the villages. These results would have beneficial effects on Agrarian Reform, ORDEV, and present and future cooperative programs.
- Resource allocations and utilization would be significantly enhanced through the market management, feed optimization, self-management improvement, data system, planning, and econometric model elements of the recommended programs.

The program recommendations for the first year also include necessary supplementation of programs initiated during the current Poultry Improvement Project, particularly in terms of the hatchery expansions (Inchas, Fayoum, and Sakha MOA breeder farms) and the breed testing programs of MOA. GPC, and ORDEV. Without continuation of essential technical assistance support, these important programs most likely will decline in effectiveness.

Also, it is strongly urged that other program elements recommended for the first year be acted upon to provide continuity of in-country technical assistance beyond the end of the current project in September, 1980. Without such support, we believe major problems in feed, poultry health, private sector development, village production, and resource utilization will develop which will serve to set back any progress achieved to date.

Further details concerning the individual elements of the recommended programs are contained in Section I-C-3 of this document. However, discussions were deliberately brief to provide ease of reading and comprehension. Details on the recommended programs are contained in previously submitted special reports, and in Section III of this final report.

SUMMARY OF RECOMMENDED BUDGET
BY COST CATEGORY
$000 - YEAR #1

EXHIBIT I-E-2
(Page 1 of 6)

		T/A * TRAINING & PROJECTS	CIP ** TYPE FUNDS	CD/DB + TYPE FUNDS	TOTALS
I-1	Current Programs	400	--	--	
2	Improved Hatching Egg Quality	300	--	--	
3	Improved Production Capacity	650	--	--	
4	Optimize Native Hatchery Capability	1500	--	--	
	SUBTOTAL	2850			2850
II-1	Optimize Available Resources	1000	--	650	
2	Mill Utilization and Capacity	500	--	2000	
3	Commodity Support Program	--	30000	--	
4	Feed Management System	850	--	--	
	SUBTOTAL	2350	30000	2650	35000
III-1	Veterinary/Extension Services Eval.	600	--	--	
2	Training & Technical Assistance	800	--	--	
3	a. Equipment (CD)	--	--	500	
	b. Commodities (CIP)	--	2000	--	
	SUBTOTAL	1400	2000	500	3900
IV-1	Poultry Health: Improved Management & Utilization	1000	--	--	
2	Commodities - Import (CIP)	--	5000	--	
3	Other (equipment, etc. CD)	650	500	2600	
	SUBTOTAL	1650	5500	2600	9750
V-1	Market Stabilization	600	--	--	
2	Processing/Distribution	--	--	7500	
3	Rendering	150	--	--	
4	Increased Production Capacity	500	--	2000	
	SUBTOTALS	1250	--	9500	10750
VI-1	Sector Management	950	--	--	
2	Improved Self-Management Program	750	--	500	
3	Public Sector Conversion	500	--	--	
	SUBTOTALS	2200	--	500	2700
	TOTALS	11700	37500	15750	64950
	PROJ. EXPED./VILPRO	998	5000	--	5998
	TTL TTLS	12698	42500	15750	70948

* T/A - Technical Assistance Programs, Training & Projects
** CIP - Commodity Import Program
\+ CD/DB - Capital Development/Development Bank

SUMMARY OF RECOMMENDED BUDGET
BY COST CATEGORY
$000 - YEAR #2

EXHIBIT I-E-2
(Page 2 of 6)

		T/A * TRAINING & PROJECTS	CIP ** TYPE FUNDS	CD/DB + TYPE FUNDS	TOTALS
I-1	Current Programs	200	--	--	200
2	Improved Hatching Egg Quality	75	--	--	75
3	Improved Production Capacity	--	--	3000	3000
4	Optimize Native Hatchery Capability	500	--	5500	6000
	SUBTOTAL	775	--	8500	9275
II-1	Optimize Available Resources	900	--	250	1150
2	Mill Utilization and Capacity	500	--	4000	4500
3	Commodity Support Program	--	40000	--	40000
4	Feed Management System	850	--	--	850
	SUBTOTAL	2250	40000	4250	46500
III-1	Veterinary/Extension Services Eval.	--	--	--	--
2	Training & Technical Assistance	800	--	--	800
3	a. Equipment (CD)	--	--	2000	2000
	b. Commodities (CIP)	--	4000	--	4000
	SUBTOTAL	800	4000	2000	6800
IV-1	Poultry Health: Improved Management & Utilization	1000	--	--	1000
2	Commodities - Import (CIP)	--	3000	--	3000
3	Other (equipment, etc. CD)	--	--	5300	5300
	SUBTOTAL	1000	3000	5300	9300
V-1	Market Stabilization	600	--	--	600
2	Processing/Distribution	--	--	15500	15500
3	Rendering	--	--	2500	2500
4	Increased Production Capacity	500	--	4000	4500
	SUBTOTALS	1100	--	22000	23100
VI-1	Sector Management	950	--	--	950
2	Improved Self-Management Program	750	--	2500	3250
3	Public Sector Conversion	300	--	--	300
	SUBTOTALS	2000	--	2500	4500
	TOTALS	7925	47000	44550	99475

* T/A - Technical Assistance Programs, Training & Projects
** CIP - Commodity Import Program
\+ CD/DB - Capital Development/Development Bank

SUMMARY OF RECOMMENDED BUDGET
BY COST CATEGORY
$000 - YEAR #3

EXHIBIT I-E-2
(Page 3 of 6)

		T/A * TRAINING & PROJECTS	CIP ** TYPE FUNDS	CD/DB + TYPE FUNDS	TOTALS
I-1	Current Programs	200	--	--	200
2	Improved Hatching Egg Quality	--	--	--	--
3	Improved Production Capacity	--	--	1000	1000
4	Optimize Native Hatchery Capability	--	--	4000	4000
	SUBTOTAL	200	--	5000	5200
II-1	Optimize Available Resources	250	--	--	250
2	Mill Utilization and Capacity	--	--	3000	3000
3	Commodity Support Program	--	50000	--	50000
4	Feed Management System	150	--	--	150
	SUBTOTAL	400	50000	3000	53400
III-1	Veterinary/Extension Services Eval.	--	--	--	--
2	Training & Technical Assistance	800	--	--	800
3	a. Equipment (CD)	--	--	2000	2000
	b. Commodities (CIP)	--	6000	--	6000
	SUBTOTAL	800	6000	2000	8800
IV-1	Poultry Health: Improved Management & Utilization	550	--	--	550
2	Commodities - Import (CIP)	--	2000	--	2000
3	Other (equipment, etc. CD)	--	--	3650	3650
	SUBTOTAL	550	2000	3650	6200
V-1	Market Stabilization	--	--	--	--
2	Processing/Distribution	--	--	11500	11500
3	Rendering	--	--	2500	2500
4	Increased Production Capacity	250	--	4000	4250
	SUBTOTALS	250	--	18000	18250
VI-1	Sector Management	600	--	--	600
2	Improved Self-Management Program	750	--	500	1250
3	Public Sector Conversion	150	--	--	150
	SUBTOTALS	1500	--	500	2000
	TOTALS	3700	58000	32150	93850

* T/A - Technical Assistance Programs, Training & Projects
** CIP - Commodity Import Program
\+ CD/DB - Capital Development/Development Bank

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SUMMARY OF RECOMMENDED BUDGET
BY COST CATEGORY
$000 - YEAR #4

EXHIBIT I-E-2
(Page 4 of 6)

		T/A * TRAINING & PROJECTS	CIP ** TYPE FUNDS	CD/DB + TYPE FUNDS	TOTALS
I-1	Current Programs	--	--	--	--
2	Improved Hatching Egg Quality	--	--	--	--
3	Improved Production Capacity	--	--	--	--
4	Optimize Native Hatchery Capability	--	--	2000	2000
	SUBTOTAL	--	--	2000	2000
II-1	Optimize Available Resources	--	--	--	--
2	Mill Utilization and Capacity	--	--	3000	3000
3	Commodity Support Program	--	60000	--	60000
4	Feed Management System	--	--	--	--
	SUBTOTAL	--	60000	3000	63000
III-1	Veterinary/Extension Services Eval.	--	--	--	--
2	Training & Technical Assistance	--	--	--	--
3	a. Equipment (CD)	--	--	--	--
	b. Commodities (CIP)	--	--	--	--
	SUBTOTAL	--	--	--	--
IV-1	Poultry Health: Improved Management & Utilization	150	--	--	150
2	Commodities - Import (CIP)	--	--	--	--
3	Other (equipment, etc. CD)	--	--	--	--
	SUBTOTAL	150	--	--	150
V-1	Market Stabilization	--	--	--	--
2	Processing/Distribution	--	--	--	--
3	Rendering	--	--	--	--
4	Increased Production Capacity	--	--	--	--
	SUBTOTALS	--	--	--	--
VI-1	Sector Management	--	--	--	--
2	Improved Self-Management Program	--	--	--	--
3	Public Sector Conversion	--	--	--	--
	SUBTOTALS	--	--	--	--
	TOTALS	150	60000	3000	63000

* T/A - Technical Assistance Programs, Training & Projects
** CIP - Commodity Import Program
\+ CD/DB - Capital Development/Development Bank

SUMMARY OF RECOMMENDED BUDGET
BY COST CATEGORY
$000 - YEAR #5

		T/A * TRAINING & PROJECTS	CIP ** TYPE FUNDS	CD/DB + TYPE FUNDS	TOTALS
I-1	Current Programs	--	--	--	--
2	Improved Hatching Egg Quality	--	--	--	--
3	Improved Production Capacity	--	--	--	--
4	Optimize Native Hatchery Capability	--	--	--	--
	SUBTOTAL	--	--	--	--
II-1	Optimize Available Resources	--	--	--	--
2	Mill Utilization and Capacity	--	--	3000	3000
3	Commodity Support Program	--	70000	--	70000
4	Feed Management System	--	--	--	--
	SUBTOTAL	--	70000	3000	73000
III-1	Veterinary/Extension Services Eval.	--	--	--	--
2	Training & Technical Assistance	--	--	--	--
3	a. Equipment (CD)	--	--	--	--
	b. Commodities (CIP)	--	--	--	--
	SUBTOTAL	--	--	--	--
IV-1	Poultry Health: Improved Management & Utilization	150	--	--	150
2	Commodities - Import (CIP)	--	--	--	--
3	Other (equipment, etc. CD)	--	--	--	
	SUBTOTAL	150	--	--	150
V-1	Market Stabilization	--	--	--	--
2	Processing/Distribution	--	--	--	--
3	Rendering	--	--	--	--
4	Increased Production Capacity	--	--	--	--
	SUBTOTALS	--	--	--	--
VI-1	Sector Management	--	--	--	--
2	Improved Self-Management Program	--	--	--	--
3	Public Sector Conversion	--	--	--	--
	SUBTOTALS	--	--	--	--
	TOTALS	150	70000	3000	73150

* T/A - Technical Assistance Programs, Training & Projects
** CIP - Commodity Import Program
\+ CD/DB - Capital Development/Development Bank

SUMMARY OF RECOMMENDED BUDGET
BY COST CATEGORY
$000 - SUMMARY TOTALS

		T/A * TRAINING & PROJECTS	CIP ** TYPE FUNDS	CD/DB + TYPE FUNDS	TOTALS
I-1	Current Programs	800	--	--	800
2	Improved Hatching Egg Quality	375	--	--	375
3	Improved Production Capacity	650	--	4000	4650
4	Optimize Native Hatchery Capability	2000	--	11500	13500
	SUBTOTAL	3825	--	15500	19325
II-1	Optimize Available Resources	2150	--	900	3050
2	Mill Utilization and Capacity	1000	--	1500	2500
3	Commodity Support Program	--	250000	--	250000
4	Feed Management System	1850	--	--	1850
	SUBTOTAL	5000	250000	2400	257400
III-1	Veterinary/Extension Services Eval.	600	--	--	600
2	Training & Technical Assistance	2400	--	--	2400
3	a. Equipment (CD)	--	--	4500	4500
	b. Commodities (CIP)	--	12000	--	12000
	SUBTOTAL	3000	12000	4500	19500
IV-1	Poultry Health: Improved Management & Utilization	3000	--	--	3000
2	Commodities - Import (CIP)	--	10000	--	10000
3	Other (equipment, etc. CD)	650	500	11550	12700
	SUBTOTAL	3650	10500	11550	25700
V-1	Market Stabilization	1200	--	--	1200
2	Processing/Distribution	--	--	27000	27000
3	Rendering	150	--	5000	5150
4	Increased Production Capacity	1250	--	10000	11250
	SUBTOTALS	2600	--	42000	44600
VI-1	Sector Management	2500	--	--	2500
2	Improved Self-Management Program	2250	--	3500	5750
3	Public Sector Conversion	950	--	--	950
	SUBTOTALS	5700	--	3500	9200
	TOTALS	23775	272500	79450	375725

* T/A - Technical Assistance Programs, Training & Projects
** CIP - Commodity Import Program
\+ CD/DB - Capital Development/Development Bank

3. GENERAL DETAILS OF PRELIMINARY RECOMMENDATIONS

The programs listed on EXHIBIT IE3 (at the end of this section) were initially developed as "stand-alone" programs. That is , each program could be individually implemented and would, by itself, achieve specific results. Implementation of each program without interfacing with the other programs would, of course, require additional costs and support elements to achieve the stated goals. However, if the individual programs were interfaced with all other relevant programs, certain cost and support elements could then be eliminated or combined. Since it is unlikely all recommended programs will be simultaneously approved and implemented, the individual program elements should be evaluated on their "stand-alone" designs rather than on the basis of interfacing with other appropriate programs.

The following descriptions delineate essential items which the programs are designed to achieve and which impact on or may be impacted by, existing situations in the Poultry Sector of Egypt. These items are identified by the same designations which appear for each individual program on EXHIBIT Further details of these programs are contained in the appropriate Special Reports, previously supplied and separately submitted.

I-HATCHERY OPTIONS

I-1 CONTINUE CURRENT PROGRAMS

I-1.1 EXPANSION OF 3 MOA FARMS (FAYOUM, INSHAS AND SAKHA)- This program provides for continuation of technical assistance essential for completion of the hatchery expansion project. AID funding for the purchase of capital goods has already been authorized and allocated. Because of the magnitude of the multi-million dollar allocation for equipment, facilities and land improvements already made, we believe continued technical assistance should be provided to assure the successful completion of this project component for at least one

year beyond the current Poultry Improvement Project activity. Additional United States and in-country training should also be provided to the Egyptian managers and operating personnel of these hatcheries. Prior experience with the protocol and operational practices of the MOA, the GOARE and USAID have indicated difficulties in fulfulling finite time frames such as are necessary for projects of this nature. Any significant delays in on-schedule start-up would have a major negative impact on the actual start-up needs concerning the breeder stocks, necessary disease prevention programs, poultry nutrition, and the ultimate supply of hatching eggs/day old chicks to the private and village flocks. Also, experiences with the hatchery personnel during the training sector the Poultry Improvement Project indicate that both further technical assistance and training of the concerned hatchery personnel are highly desireable to assure a reasonably effective and on-schedule startup.

I-1.2 BREED TEST PROGRAMS - ORDEV, MOA, AGRARIAN REFORM, GPC- Although much effort has been applied to have such tests initiated, most MOA personnel did not accept the necessity until those personnel participated in the U.S. training program element of the project. Then, as a result of their experiences in the Poultry Improvement Project Training Program from September, 1979 through September, 1980, the MOA personnel recognized the need. However, in spite of a number of announced plans for the tests, none have yet commenced. MATHTECH's breed and genetics specialists firmly believe the native breeds presently used in Egypt are not nearly as productive as imported stock available from developed countries such as the USA. Therefore, the reliance on currently used Egyptian breeds is restricting productivity to the lower outputs of the Egyptian breeds, and subsequently upon poultry production in general. Therefore, without continued technical assistance and support on-site, it is quite likely these tests may not be conducted at all, and most likely would not yield realistic results.

I-2 IMPROVE CURRENT HATCHING EGG QUALITY- This element is an alternative to option I-3 (IMPROVEMENT OF CURRENT PRODUCTIVE CAPACITIES). The intention is to improve only the sources and supply of clean hatching eggs for the native hatcheries. Team observations of practices in breeding farms and hatcheries supplying hatching eggs and/or baby chicks to the village sector, indicates a major step toward improved poultry production at the village level, can be achieved by improving the supply of disease-free hatching eggs and/or chicks, and to eliminate the use of recycled (fertile) eggs from the village flocks. Accomplishing this tack would require blood testing of the existing parent stock and the subsequent replacement of diseased parents. The establishment of an ongoing blood testing program for poultry disease control and village productivity improvement will also be required to maintain the supply of disease free hatching eggs and/or baby chicks to the village sector.

I-3 IMPROVE CURRENT PRODUCTIVE CAPACITIES- As in Option I-2, this element has as its goal the supply of "clean" hatching eggs/baby chicks to the villages, and the optimization of existing MOA farm capacities. During the (Poultry Improvement Project) evaluation of existing hatchery/breeder farm operations, it was noted that a significant increase in capacity -- in some cases up to 30 percent or more -- could be achieved by balancing the key limiting factors in their production processess. This would include items such as providing sufficient laying pens to match present incubator capacities, etc. Therefore, rather than construct new farms and hatcheries, this recommended program would equip and remodel the existing MOA farms to obtain optimum production rates within the maximum existing capabilities of existing MOA farms and hatcheries.

I-4 OPTIMIZE NATIVE HATCHERY CAPABILITIES- While significant improvement can be achieved through the supply of "clean" eggs and/or baby chicks, an even greater improvement can be realized if the more finite problems relating directly to native hatchery design, construction, and operation can be resolved. The Poultry Improvement Project was not designed to assess such problems; therefore, a more detailed study of the problems and development and testing of corrective programs is urgently needed. In addition, recognizing the importance of the native hatcheries in the rural sector, a number of key persons in the MOA have suggested/requested guidelines for such a program. The P.I.P. team agrees on the vital importance of the native hatchery to the village sector, and the probability of their perpetuation. Therefore, if problems relating to these hatcheries can be properly resolved, significant improvements in village poultry production are highly possible. The team also agrees that regardless of any rationale to the contrary, the native hatcheries will remain a significant part of the rural component of the Egyptian poultry sector, at least for the foreseeable future. It is also recommended that the enlargement of MOA breeder farm capacities will be necessary to supply the proportionately greater "clean egg" requirements for the native hatcheries, under such a program.

II - FEED OPTIMIZATION OPTIONS

These programs are intended to obtain the best possible use of existing feed resources, and to provide the necessary quantity and quality of feed, necessary to support a viable and dynamic poultry industry in Egypt.

II-1 The team believes up to 40 percent of the existing available feed resources are not being fully utilized ... in fact are being wasted. This is supported by numerous analyses of feed rations used in Egypt,

the computation of actual feed conversion ratios, and through direct observation by team feed and poultry nutrition specialists. We believe that through improvements in quality control, ingredient testing and analysis, and a variety of other feed and poultry production management activities, existing feed resources can be improved up to 40 percent during the recommended life of this program element. These must be supported by a minimal amount of equipment and an optimal amount of technical assistance and training. Such programs should include an inventory (feed ingredient) control, and availability tracking system; identification and optimal use of native ingredients (such as peanut hulls, citrus shells, and other waste and/or agricultural products and by-products); least-cost, most effective ingredient/ration formulation; and use of premixes and/or concentrates to eliminate or bypass existing milling ingredient problems. These improvements will benefit the entire poultry sector, with a major positive impact on the rural flocks.

II-2 MILL UTILIZATION & CAPACITY IMPROVEMENT- Major problems exist with the condition and operational performance of Egyptian feed mills. Many mills are obsolete, while others have various mechanical deficiencies resulting in improper milling and formulation of feed, Therefore, even when ingredients and formulas may be appropriate, the finished ration is not properly milled and balanced. This results in feed waste, poor feed conversion and significant losses in handling and distribution. Further waste and increased costs result from the practice of handling all feed in bags, rather than in bulk. Storage is not carefully controlled, resulting in the deterioration of feed quality and content. Feed in transit and storage is therefore accessible to rodents, pests, and birds who consume a portion of these valuable resources and also contaminate the feed. In many instances this results in the transfer of damaging diseases to the feed. This recommendation includes A & E study and development of the means by which the use of bulk handling capabilities could be added to the Egyptian support system over time.

II-3 COMMODITY SUPPORT PROGRAM- This supplements sector needs through use of the AID-CIP and other similar programs, to ensure the supply of adequate feed rations to the sector. It would be reduced, and subsequently eliminated, as self-sufficient Egyptian capabilities developed.

II-4 FEED MANAGEMENT SYSTEM- This system is an alternative to the program outlined in II-1 above, entitled "Optimize Available Resources". It includes scaled-down technical assistance, training, feed formulation and ingredient tracking program elements as previously described. This is the least-cost option aimed at maximizing existing feed resources.

III - VETERINARY/EXTENSION SERVICE OPTIONS

In the United States and other developed countries, government supported Extension Services are essential to the private and rural sectors. Such services also exist in Egypt, but they are drastically understaffed and underbudgeted. There is an insufficient number of poultry health stations to serve existing villages. Plans exist to establish health stations in every village, but existing stations cover less than 10 percent of the village's poultry flocks. Therefore, village flock owners must "trail drive" flocks over long distances, to obtain the necessary vaccination and other services -- an unreasonable situation. Since the Poultry Improvement Project was not intended to provide an in-depth study and assessment of this essential Egyptian-MOA function, a new program is necessary to study the problems, develop and test various corrective programs. This recommended program would also provide necessary additional technical assistance for implementation of this program, in conjunction with existing Egyptian institutions such as the governorate systems. Project Expedite/VILPRO would provide some means by which the projected infrastructure would be tested, and wherein this support could be accomplished. Commodities, technical assistance, equipment, and training are included in these programs.

The recommended equipment involves delivery and transportation systems necessary to deliver the essential services to the villagers and their flocks, rather than requiring the village flock owners, to travel to the existing health stations to obtain the services. Considering the scarcity of public transportation in the rural areas, this concept is considered essential to successful implementation of this program.

IV - POULTRY HEALTH/VACCINE/PHARMACEUTICAL OPTIONS

Poultry disease is a major impediment to achieving optimum production of poultry product in Egypt. Diseased chickens also, consume valuable resources, but are then wasted since the resources are not converted to finished edible product. Project Expedite/VILPRO contains certain elements, which if implemented, would have a desirable impact on this major problem, However, since VILPRO applies to only two governorates, other options are outlined in this program. The first involves providing only additional technical assistance and training to supplement VILPRO. This would allow appropriate effort to be extended to poultry activity outside the two VILPRO governorates. The second option involves a program designed to provide the development of a national infrastructure by which significant existing deficiencies could be eliminated, over time. Element IV-1 involves technical assistance and training; IV-2 involves funding by which the shortfall in vaccines and other items (particularly for the rural sector) would be overcome; and IV-3 concerns those actions necessary for Egypt to develop its own stand-alone capabilities in materials and infrastructure to control its poultry disease problems.

V - POULTRY PRODUCTION/MARKETING

As previously noted, the public segment of the Poultry Sector of Egypt provides essential support to the entire poultry sector...including villages and small private producers (which number over 3,000 , each with a capacity

of less than 5,000 broilers per cycle). Therefore, our program includes elements necessary for improving GPC's capability to support these sectors.

V-1 MARKET STABILIZATION/REPORTING SYSTEM- The instability of wholesale price levels received by private poultry producers in Egypt, has been a major hinderance to growth of the private poultry sector. It has also been a significant cost factor (through price and cost subsidies) to the Egyptian Government which has had to provide such subsidies to keep supply and demand factors in relative balance. Simultaneously, the lack of coordinated release of frozen imported poultry meat (by the Ministry of Supply, with funds provided by AID-CIP) has had a major negative impact, both on the growth of private sector production, as well as on the consumer's economic pressures. These unstable conditions have subsequently resulted in significant increases in the costs of production to both public and private sectors. Whenever such instability has developed in the past, many private producers have gone out of business, with prices received by village producers also deteriorating significantly. To provide the climate and conditions necessary to stimulate private sector growth, and to prevent undue hardships on the village producers, the team believes the market stabilization program to be of highest priority. (See separate SPECIAL REPORT on MARKET STABILIZATION) Program elements will provide the means by which critical information on market conditions will be accumulated, and utilized for production planning and resource allocation. This would also provide the basis for a distribution-storage program interrelating product availabilities and prices at the marketplace. Existing cold storage facilities can be more effectively utilized to stabilize the supply of poultry than is currently accomplished. The amount of poultry on the market at any given time could then be used to prevent an oversupply of product in terms of the market's ability to "remove" the product. This levelling of product available at any given time will create market balancing conditions, and thereby eliminate the opportunity for unethical food brokers to impact market prices for the

available product. By doing so they take advantage of the situation to create an imbalanced market supply which negatively affects private sector growth and consumer prices, as has occurred so often in the past.

V-2 PROCESSING & DISTRIBUTION- This program provides for the construction of slaughterhouse and cold storage facilities for the entire poultry sector, especially for rural and small private producers. At the present time, regardless of market conditions, these producers must accept whatever prices exist when their product is ready for market. It also includes development of less-than-whole-chicken packaging capabilities which would allow poultry to be sold at lower single package prices than for whole birds, thereby making purchase of poultry product more economically feasible for a larger segment of the Egyptian population than currently exists. As it is now either a "whole bird" must be purchased, or none at all.

V-3 BY-PRODUCTS UTILIZATION/RENDERING PLANT- This capability does not presently exist in Egypt to any reasonable degree, with all such by-product now being wasted. Yet, offals and other by-products from poultry production are valuable assets in poultry production in developed countries.

V-4 IMPROVED PRODUCTION/SUPPORT UNITS OUTPUT- This element primarily concerns GPC. Since GPC provides technical and planning services for all public and private poultry production units in Egypt, it is essential that GPC operate at optimum effectiveness. Improvements in GPC effectiveness result in improvements throughout the Egyptian poultry sector. The recommended programs include sufficient on-site technical assistance in key support and decision making functions to optimize current production capabilities in GPC. Since GPC is a Government of Egypt production unit, its production can be controlled and planned on the basis of market considerations. Planned production of this type by GPC can therefore tend to balance

market supplies of poultry thereby preventing oversupply and price deterioration. Also, if GPC production will tend to create an oversupply, and cannot otherwide be reduced, the poultry can be slaughtered and stored until the market supply is "in balance".

VI - SECTOR DEVELOPMENT/MANAGEMENT

The purpose of this program is to provide the skills and assistance by which the poultry sector can be managed most effectively. It includes sector management, data system improvement, improved planning capabilities, development of the necessary capabilities for self-management, and a program by which the production responsibilities of the public sector would be transferred to the private sector in a disciplined manner. If properly handled, such a transfer would not create major problems or shortages; nor would it remove or dilute the public sector's essential support for the private and village/rural sectors.

VI-1 MARKET/SECTOR MANAGEMENT- Includes completion and expansion of the econometric model to encompass all meat options and essential multisector ingredients such as maize. It also entails centralization of data necessary for good management, effective resource utilization and allocation, and significant improvement in Egyptian sectoral and resource planning. As demonstrated during the latter stages of the PIP project, the use of the poultry sector segment of the econometric model has significant value in planning the most effective use of Egypt's relatively scarce resources and related elements of Egypt's Five-Year Plan for Food Security. While a large part of this program involves the supply of highly technical services, it also includes the necessary hardware, program design, and support elements to bring such programs into complete reality in Egypt.

VI-2 IMPROVED SELF-MANAGEMENT CAPABILITIES- This program is designed to provide the necessary on-site assistance and training of key personnel in technical, as well as management, skills. At the completion of this element, it is anticipated the poultry sector should have "stand-alone" management capabilities, which it does not now have.

VI-3 PUBLIC SECTOR CONVERSION TO PRIVATE SECTOR CONTROL- This component concerns the transfer of public sector production capacities to private sector operations on a disciplined basis. The current shortfall of poultry product/high quality protein food would most likely be significantly worsened if the public sector production units were to discontinue production at any time. However, Egypt does not yet have sufficient private sector capability (or even desire) to assume responsibility for the public sector production units. Market and other conditions are such that it would be/is extremely difficult to convince foreign investors to take over such production units. Therefore, the team believes a disciplined program, developed in conjunction with other programs to lessen or eliminate risks to the private sector, must be implemented if this objective is to be realized. This program will require both in- and out-of-country activity, and technical assistance. The purpose of this element is to identify constraints to such a conversion; to develop the necessary elements by which such constraints may be overcome; and to work with private sector elements involved in such a transfer.

* SUMMARY

It should be noted that additional training of Egyptian personnel has been included in almost every program recommended. The results achieved during the last year of the Poultry Improvement Project Training Program have been extremely good. However, the number of persons trained during the entire

project has not been sufficient to make significant impact on the poultry sector as a whole. Regardless of the action taken and recommended herein, it is strongly recommended that the Training Program of the current project be extended for at least one additional year beyond the current project's completion date.

66

PROPOSED PROGRAM TITLES (SEE DESCRIPTION FOR GENERAL DETAILS)	Villages	Sm. Private	Lg. Private	Semi Public	Public (GPC)	Native	Other (Elec...)	Independent	GPC	MOA	BENEFITS IF PROGRAM IS IMPLEMENTED (Year 1 / Year 2 / Year 3 / Year 4 / Year 5 / Total Program)	YR 1	YR 2	YR 3	YR 4	YR 5	TOTAL EST. PROGRAM COSTS	
	Poultry Production					Hatcheries (Suppliers)						ESTIMATED COSTS (000)						
I. HATCHERY OPTIONS																		
I.1- Continue Current Programs																		
I.1.1- Expansion 3 MOA Farms	*					*				*	Approx. 20% increase in MOA Farm output - 3 Governorates only	200					200	
I.1.2- Breed Testing (MOA,GPC,ORDEV)	*	*		*	*	*	*		*	*	Resolution of performance capabilities of Native vs. certain imported breeds	200	200	200			600	
												400	200	200			800M	S/T
I.2- Improve Current Hatching Egg Quality																		
I.2.1- Blood Test/Replace Parent Stock (MOA/GPC)	*	*		*	*	*			*	*	Reduction in mortality & increased production by 10%	150					150M	
I.2.2- Qualitative Mgmt./Support Programs	*	*	*	*	*	*	*	*	*	*	Reduction in mortality & increased production by 5%	150	75				225	
												300	75				375M	S/T
I.3- Improve Current Productive Capacities																		
I.3.1- Blood Test Parent Stock Purge	*	*			*	*			*	*	This would approximately double current MOA Hatching Farm capacity and provide majority of existing Native Hatchery/Village Flock hatching egg needs	75					75M	
I.3.2- Replace Parent Stock to Fullest Capacity	*	*	*	*	*	*	*	*	*	*		75					75	
I.3.3- Reengineer Bal. of 9 MOA Breeding Farms to Capacity	*	*		*		*	*			*		500	2000				2500	
I.3.4- Expand/Add To Optimum Productivity	*	*		*		*	*			*			1000	1000			2000	
												650	3000	1000			4650M	S/T
I.4- Optimize Native Hatchery Capabilities																		
I.4.1- Study, Develop Programs, Test	*					*				*	Identify correctable problems & future capability	1200					1200M	
I.4.2- Eliminate Health Problem Transmission	*	*				*	*			*	Improve hatchability and village supply by 20%	300	2000				2300	
I.4.3- Add Hatching Egg Support Capacities	*	*				*	*			*	Provide all required baby chicks for villages		2000	2000			4000	
I.4.4- Improve N/H-Village Support Elements (Feed, Vaccines, Veterinary/Extension Services)	*	*				*	*			*	Reduce impediments to minimum possible acceptable rates, and increase production in villages to maximum possible, perhaps up to a 50% increase in village production		2000	2000	2000		6000	
												1500	6000	4000	2000		13500M	S/T
												2850	9275	5200	2000		19325M	TTL
II. FEED OPTIMIZATION OPTIONS																		
II.1- Optimize Available Resources																		
II.1.1- Feed Inspection & Analysis Program	*	*	*	*	*	*	*	*	*	*	Improved feed utilization	150	150				300M	
II.1.2- Identification Local Ingredient/Specs	*	*	*	*	*	*	*	*	*	*	Quantity / Quality / Net Total: First Year 10% / 20% / 20%; Second Year 20% / 25% / 30%; Third Year 30% / 30% / 40%	100	50				150	
II.1.3- Feed Formulation Management/Support	*	*	*	*	*	*	*	*	*	*		500	500				1000	
II.1.4- Inventory, Availability, Tracking System	*	*	*	*	*	*	*	*	*	*		(Included in III.1.3)						
II.1.5- Concentrate/Premix Program	*	*	*	*	*	*	*	*	*	*		(Should be self-supporting in CIP Program)						
II.1.6- Feed Analysis Laboratories (5)	*	*	*	*	*	*	*	*	*	*		400					400	
II.1.7- Training Program	*	*	*	*	*	*	*	*	*	*		150	150				300	
II.1.8- Technical Assistance (Nutrition/Operation)	*	*	*	*	*	*	*	*	*	*		350	300	250			900	
												1650	1150	250			3050M	S/T
II.2- Mill Utilization and Capacity Improvement																		
II.2.1- Engineering Study and Upgrade of Existing Mills	*	*		*	*	*			*	*	10% improvement in cost of feed and conversion	2000	1000				3000	
II.2.2- Improved Management/Operations Program	*	*		*	*	*			*	*	5% improvement in cost and conversion	500	500				1000	
II.2.3- Bulk Handling System	*	*		*	*	*			*	*	20% savings in labor, transportation and waste in feed production		3000	3000	3000	300C	12000	
												2500	4500	3000	3000	300C	16000	S/T
II.3- Commodity Support Program	*	*	*		*	*			*	*	Includes purchase and supply of all feedstuffs necessary to eliminate current shortages and to feed existing poultry.	30MM	40MM	50MM	60MM	70MM	250MM	*
II.4- Feed Management System																		
II.4.1- Technical Assistance	*	*	*	*	*	*	*	*	*	*	10% overall improvement in feed cost and available volume dependent on feed options selected.	300	300	300			600M	
II.4.2- Training	*	*	*	*	*	*	*	*	*	*		150	150				300	
II.4.3- Central Feed Formulation Service	*	*	*	*	*	*	*	*	*	*		250	250				500	
II.4.4- Inventory/Availability Tracking System	*	*	*	*	*	*	*	*	*	*		150	150	150			450	
												850	850	150			1850M	S/T
												5000	6500	3400	3000	300C	20900M	TTL

67

PROPOSED PROGRAM TITLES (SEE DESCRIPTION FOR GENERAL DETAILS)	Sectors Impacted: Poultry Production – Villages	Sm. Private	Lg. Private	Semi-Public	Public (GPC)	Hatcheries (Suppliers) – Native	Other (Electrid)	Independent	GPC	MOA	Benefits if Program is Implemented: Year 1	Year 2	Year 3	Year 4	Year 5	Total Program	Estimated Costs (000): Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total Est. Program Costs	
III. VETERINARY & EXTENSION SERVICES																							
III.1- Evaluation & Needs Assessment	*	*		*		*	*			*	Identify specific needs and implementation program. Provide immediate and ongoing assistance to rural sector. Eliminate material deficiencies to allow for maximum improvement in rural sector and village productivity.						600					600M	
III.2- Training & Technical Assistance	*	*		*		*	*			*	-						800	800	800			2400	
III.3- Equipment & Materials	*	*		*		*	*			*													
. Capital Expenditures (Inspn., Health, Etc.)	*	*		*		*	*			*	-						500	2000	2000			4500	
. Commodities (Vaccines, Feeds Etc)	*					*											2000	4000	6000		(C/B)	12000M	*
																	1900	2800	2800			7500M	TTL
IV. POULTRY HEALTH/VACCINES/PHARMACEUTICALS																							
IV.1- Improved Management & Utilization																							
IV.1.1- Technical Assistance	*	*	*	*	*	*	*	*	*	*	Reduction in disease/increase in production-existing flocks.						750	750	300			1800M	
IV.1.2- Training of Personnel	*	*		*	*	*	*		*	*	5%	10%	15%	20%	20%		250	250	250	150	150	1050	
IV.2- Supply of Materials - Vaccines, Pharmaceuticals, Etc.	*	*	*	*	*	*	*	*	*	*	Supply sufficient quantity/quality vaccines until self-production fulfills needs						1000	1000	550	150	150	2850M	S/T
IV.2.1- Self-Produced																	5000	3000	2000	1000		11000M	*
A. Update Abbasia (Vaccines)	*	*	*	*	*	*	*	*	*	*	Improve existing quality to acceptable levels and quantity to 20%. Develop details & engineering for new facilities & financing.						250					250M	
B. Pre-Investment Study (New Plant)																	100					100	
C. New Vaccine Plant	*	*	*	*	*	*	*	*	*	*	Reduce reliance on imports to absolute minimum. Reduce costs by 50%.							1500	1500			3000	
D. New Pharmaceutical Repackaging Plant	*	*	*	*	*	*	*	*	*	*								1500	1500			3000M	
																	350	3000	3000			6350M	S/T
IV.2.2- Improved Quality Control											Improve availability & poultry health to maximum.												
A. Import SPF Eggs	*	*	*	*	*	*	*	*	*	*	Essential for improved vaccine quality.						500	500				1000M	
B. New SPF Farm	*	*	*	*	*	*	*	*	*	*	Replace need for imports						300	2200				2500	
C. Import/System Inspection (Labs)	*	*	*	*	*	*	*	*	*	*	Eliminate Quality Control Problems						50	50	50			150	
																	850	2750	50			3650	S/T
IV.2.3- Improved Disease Diagnosis (Labs)	*	*	*	*	*	*	*	*	*	*	Essential for disease control and eradication						300	300	100			700M	
IV.2.4- Improved Delivery System for Disease Control											Reduce waste and deterioration by 50%												
A. Storage & Handling Facilities	*	*	*	*	*	*	*	*	*	*	Provide for delivery of essential services to rural sector. Reduce mortality and improve rural production 20%						250	250				500M	
B. Poultry Hlth. Stations-Rural	*	*				*	*			*							1000	1000	500			2500	
C. Mobile Dlvy. System - Rural	*	*				*	*			*							1000	1000	500			2000	
																	2250	2250				5000M	S/T
																	4750	9300	3900	1500		16950M	TTL
V. POULTRY PRODUCTION/MARKETING																							
V.1- Market Stabilization (Reporting System)											Stabilize market to allow for private sector expansion and its ability to take over from public sect. Reduce production cost & prices to consumer as well as eliminate losses to Government.												
V.1.1- Market Information System	*	*	*	*	*	*	*	*	*	*							500	500				1000M	
V.1.2- Distribution/Storage Program	*	*		*	*		N/A										100	100				200	
																	600	600				1200M	S/T
V.2- Processing & Distribution																							
V.2.1- Slaughterhouse Availabilities	*	*	*	*	*						Improve availability to private & rural producers to eliminate losses and assure growth. Increase poultry product availability to poorer consumers by minimum of 50% of production.						3000	7000	5000			15000M	
V.2.2- Refrigerated/Frozen Storage							N/A										2000	6000	4000			14000	
V.2.3- Packaged Poultry Distribution to Increase No. Consumers							N/A										500	2500	2500			5500	
							N/A										7500	15500	11500			34500M	S/T
V.3- By Products Utilization-Rendering	*	*	*	*	*	*	*	*	*	*	Reduce poultry production costs (through by-product utilization) by 10%.						150	2500	2500			5150M	S/T
																	10750	23100	15750			49600M	TTL
V.4- Improved Production Units Output																							
V.4.1- Facilities/Equipment As Is (GPC/Private)					*		N/A				Improve productivity 15%						500	500	250			1250M	
V.4.2- Improved Facilities/Eqpt. (GPC)					*		N/A				Improve capacity by 25%. Reduce or eliminate GPC operating losses.						2000	4000	4000			10000	
																	2500	4500	4250			11250M	S/T

PIP PROGRAM RECOMMENDATIONS (EGYPT - AID GRANT #263-0060/MT PROJECT #2044) (As of May 30, 1980) 68

PROPOSED PROGRAM TITLES (SEE DESCRIPTION FOR GENERAL DETAILS)	Sectors Impacted – Poultry Production: Villages	Sm. Private	Lg. Private	Semi-Public	Public (GPC)	Hatcheries (Suppliers): Native	Other (Electrl'd)	Independent	GPC	MOA	BENEFITS IF PROGRAM IS IMPLEMENTED (Year 1 – Year 5, Total Program)	ESTIMATED COSTS (000) YR 1	YR 2	YR 3	YR 4	YR 5	TOTAL EST PROGRAM COSTS	
VI. SECTOR DEVELOPMENT MANAGEMENT																		
VI.1- Market Sector Management	*	*	*	*	*	*	*	*	*	*								
VI.1.1- Complete/Expand Econ. Model	*	*	*	*	*	*	*	*	*	*	Complete Poultry Sector Model	350	350				700M	
VI.1.2- Improve Existing Data System A. Data Flow and Formats B. Central Data Consolidation System C. Utilization of Data	*	*	*	*	*	*	*	*	*	*	Expand into dairy & livestock use for management and resource allocation. Improve resource utilization by up to 30%. Reduce relevant MOA budget needs by 20%. Improve data accuracy & overall comprehensiveness by 50%. Provide accurate data to improve effectiveness of decision making by up to 50%.	300	300	300			900	
VI.1.3- Improved Planning System and Resource Allocation/Utilization	*	*	*	*	*	*	*	*	*	*		300	300	300			900	
												950	950	600			2500M	S/T
VI.2- Improved Self-Management Capabilities	*	*	*	*	*	*	*	*	*	*								
VI.2.1- Technical Assistance/Management Development											Ongoing assistance for realization of most immediate possible results.	250	250	250			750M	
VI.2.2- Expanded Mgmt. Training Program												500	500	500			1500	
VI.2.3- National Poultry Training Center											Produce in-country model poultry farm training for operational personnel, on-site managers, and new poultry personnel in all sectors. Should realize a 10 to 20% improvement in their existing costs of production and productivity.	500	2500	500			3500	
												1250	3250	1250			5750M	S/T
VI.3- Public Sector Conversion to Private Producers		*	*	*	*			*	*	*	Convert GPC and MOA production units to Private Sector Operations. Foreign/Egyptian investors, Governorate programs, joint ventures, etc. Will take Government out of competition with Private Sector development and place Government in purely supportive/management role regarding poultry sector	500	300	150			950M	S/T
												2700	4500	2000			9200M	TTL
												13200	35900	21650	1690	150	48900M	

MATHTECH, Inc. - Atlanta, Ga., USA

*COMMODS - CIP TYPE FUNDS - NOT INCLUDED IN TOTALS

SECTION II - THE PROJECT

This section outlines the basic organization, findings, results and recommendations developed from The Poultry Improvement Project. It provides broad information only, since all project task subjects have been specifically covered in finite detail in Section III and in the Special Reports and Interim Project Reports previously submitted. The project team prepared and submitted many individual documents at the request of USAID-EGYPT, and the Ministry of Agriculture (MOA) of the Government of the Arab Republic of Egypt (GOARE, or GOE as noted in various documents regarding the project) as well as monthly progress reports.

There are two (2) major parts of this Section. They are:

- II A - PROJECT DESCRIPTION, ORGANIZATION & RESULTS
- II B - RECOMMENDATIONS FOR CURRENT AND FUTURE ACTION

The reader is reminded that a major paradox existed concerning this project. The project was based upon the results of a Project Feasibility Study conducted in 1976 and 1977. As a result of that study, the Project Papar was developed by which project funding was obtained, and it was dated MAY 1977. The project was not awarded until July 1978, and did not actually commence field activity until September 1978. The term of the project ran from that time until September 1980. From the time of inception of the basic strategy of the project was developed in 1976 until the final stages of implementation of the project, a span of four years existed. During those years, the economy of Egypt was extremely dynamic, and major changes in all sectors of the Egyptian economy occurred quite regularly during that time. This was particularly true as concerns the Egyptian poultry sector. Therefore, it will be noted as one reviews this and other project documents there tends to be certain degrees of disparity between the original objectives of the Project Paper, and those to which the project team found necessary to address during the conduct of the project.

It is also quite likely that those dynamics will continue in future years. Therefore the team has strongly recommended continued Technical Assistance be provided to the Ministry of Agriculture, to keep close control over sector developments and the allocation of its resources in order to fulfill the objectives of the Food Security Program of the Government of Egypt.

SECTION II - THE PROJECT

A. PROJECT DESCRIPTION

1. OVERVIEW

This project was funded by a $5,032,741 grant of the United States government's Agency for International Development (USAID)to the Ministry of Agriculture (MOA) of the Government of the Arab Republic of Egypt (GOAR or GOE). The contract was directly between the Ministry of Agriculture and the contractor, Mathtech,Inc. of Prinecton, New Jersey, USA. The project was implemented by the Food, Agriculture and Nutritional Services (FANS) department of Mathtech, Inc. with the primary project offices located in Atlanta, Georgia, USA. A field office was established in Cairo, Egypt to coordinate all activities with the MOA and USAID-EGYPT as became necessary. This was the first "Host Country Contract" of any magnitude which was awarded for Technical Assistance programs of the Agricultural section of USAID-EGYPT. The A.I.D. Grant number was 263 - 0060.

The grant was divided into two separate parts...one of $2,571,520 for Technical Assistance, and one of $2,461,221 for Hatchery Expansion Facilities, Equipment and associated Commodities. This report primarily concerns the expenditure of funds for Technical Assistance.

Request for Proposal (RFP) was issued on 20 December 1977 by The Ministry of Agriculture, Undersecretray of State for Animal Production, Dr. M.A. Kheireldin of the Government of the Arab Republic of Egypt. RFP's were sent to all firms qualifying to recieve same,after advretisement in the Commerce Business Daily of the U.S. Department of Commerce. Upon review of the proposals submitted , the Ministry of Agriculture's evaluation committee ultimately selected, and a contract was negotiated with the Food, Agriculture and Nutritional Services group of Mathtech Inc. Date of Contract signature was July 20, 1978 and project startup took place on September 10, 1978 after contract review and subsequent issuance of project funding on September 10, 1978.

In compliance with the project proposal, Mathtech dispatched an organizational team to Cairo in September 1978 for the purposes of establishing project offices and to obtain approval of project team members previously nominated for various team positions, including the permanent staff to be stationed in Cairo thru the life of the project. This was accomplished by mid-September, and the first team of specialists arrived in Egypt on October 10th, 1978 to commence full scale field operations. Final field operations for the project occurred on September 10, 1980.

SECTION II - THE PROJECT

Listed below is a comparative summary of initially projected and actual project inputs by The Food,Agriculture and Nutritional Services group of Mathtech, Inc. as concerns personnel and consultant inputs into project activities. This is considered a vital factor since the actual situations encountered by the team in their field work in Egypt, required substantially higher expert inputs than had been anticipated in the original project paper. This should provide a valuable guide for future project planning in Egypt.

TABLE I - COMPARISON OF PERSON DAYS SPENT ON PROJECT

	TOTAL	IN EGYPT	IN USA
ACTUAL PROJECT INPUT	5345	2147	3198
PROJECTED IN USAID PROJECT PAPER	2525	(NOT SPECIFIED.....)	
DIFFERENCE	2820	----------	
PROJECTED IN CONTRACT/WORKPLAN	5020	----------	
DIFFERENCE	145	----------	

It may be safely assumed from the above comparison, that projects such as those outlined in the Project Paper, will most likely be consiedrably more labor intensive than was anticipated in this Project Paper. Also, as will be noted later in this document, that many unknown factors will be identified during the course of such projects. And as those factors are identified, it would be significantly more expeditious and effective for all concerned, if it were possible to provide funding by which such programs requiring continuity, can be implemented within a reasonable time frame after identification. The team believes such action essential to attainment of desired objectives, and to prevent potential waste of earlier project efforts, especially so in project situations as dynamic as that in which the Poultry Improvement Project (PIP) was involved.

2. ORGANIZATION

Although the team arrived in Egypt in September and October 1978, actual field offices in Cairo were not available until February-March 1979. During the interim, the team operated from a flat rented for use as an operations office and housing for team members during those times when hotel rooms were in extremely short supply.

While the Project Paper had separated the project into 6 primary tasks plus training, upon review of the poultry sector as then exising, and in compliance with some of the additional activities included by Mathtach in the Work Plan for the Project, the project was separated into 9 primary project tasks. Subsequently, a 10th was added when additional needs were identified, and one of the primary tasks was significantly expanded to include assessment of a major contraint identified during early days of project field activity. The added task was Feed Supply, and the expanded task was the change of the Vaccine-Pharmaceutical task to Poultry Health & Vaccines-Pharmaceuticals.

Project personnel were then separated into specialized task forces to address the issues involved with each major task. During the course of the project, it became necessary to make several additions to these task teams in order to address the additional problems identified during the initial (or Discovery) phase of the project. (See EXHIBIT II A - 1 on the following page for team assignments)

All project assignments and activities were directed from the contractor's primary project office in Atlanta, Ga. USA under the direction of the contractor's Project Director - George O'Day. Field assignments were managed and assisted by the Project Field Office in Cairo, Egypt by the Project Technical Manager and Field Operations Manager, both assigned full time in Cairo. Project specialists were rotated into Cairo as their tasks required. All team reports and analysis were primarily completed in the Atlanta project office and particupated in by involved team members including the permanent field staff in Cairo. All field activities were coordinated by the Cairo staff with the office of the Project Director for the MOA, Dr. M.A. Kheireldin. Coordination as necessary, was also maintained with the USAID-EGYPT Project Officer in Cairo to assure compatability with USAID's objectives and operating requirements.

TEAM - TASK ASSIGNMENTS

TASK #	TASK TITLE	TEAM POSITION	MEMBER NAME	SPECIALTY
010	Management	Project Manager	O'Day, George R.	Management
		Project Coordinator	Brewer, Pete	Management
		Project Administrator	Boynton, Vicki F.	Administration
020	Data Base	Co-Leader - Data	Pedersen, John	Poultry Economics
		Co-Leader - Operations	Cushen, Dr. W. E.	Operations Research
		Econometric Modelling	Wiens, Dr. Thomas B.	Agricultural Economics
		Econometric Modelling	Maduafokwa, Casimir C.	Econometrics
030	Sector Analysis	Co-Leader	Voss, Dr. Leonard	Economics
		Co-Leader	Jasper, Dr. A. William	Poultry Science
		Senior Analyst	Schmeiser, Stephen G.	Economics
		Post Production	Brant, Dr. A. Wade	Processing Technology
040	Breed/Hatchery Improvement	Leader & Genetics	Shaffner, Dr. Clyne	Genetics
		Geneticist	McClary, Dr. Cecil	Genetics
		Breed Development	Wilson, Dr. Henry	Hatchery Specialist
050	Production	Leader & Production and Feed	Harms, Dr. Robert	Poultry Nutrition
		Leader & Egg Production	Bell, Donald	Egg Production
		Co-Leader - General Management	Huttar, John C.	Broiler Production
		Broiler Production	Cason, Dr. Carl	Poultry Processing
		Poultry Management	Douglas, Dr. Carrol	Nutrition
		Turkey, Duck, Water Fowl Production	Thomason, Dr. David M.	Duck & Turkey Specialist
055	Feed Supply	Co-Leader	Day, Dr. Elbert	Feed & Nutrition
		Co-Leader	Bushong, Dr. Rex	Feed & Nutrition
060	Village/Rural Sector	Co-Leader & Extension	Herrick, Lee	Extension Specialist
		Co-Leader	Larson, Dr. Barbara	Rural Sociology
070	Poultry Health	Leader & Microbiology	Appleton, George	Vaccines & Pharmaceuticals
		Pharmaceutical Production - Pathology	Saif, Dr. Mohammed	Pathology
		Pharmaceutical Supplies - Virology	Fadly, Dr. Aly	Virology
		Poultry Health Programs	Reid, Dr. Malcolm	Poultry Science
080	Training	Leader & Operations	Lodge, Donald E.	Training Management
		Coordinator	Boone, Dr. Merritt	Poultry Training
		Technical Director	Thomason, Dr. David M.	Technical Training
090	Hatchery Expansion	Leader	Bond, John F.	Poultry Management

POULTRY IMPROVEMENT PROJECT

(4/18/80)

EXHIBIT II-A-1

3. DESCRIPTION OF THE PROJECT

The team believes that issues created by the dynamics of the economy in which such projects are conducted to be of such importance in successful completion of such projects, that we have included on Attachment IIA 1 & 2 (At the back of Section IIa), the objectives of the project as stated in the Project Paper (Attachment IIA1) and the primary tasks as outlined in the contract's original work plan (Attachment IIA2). A comparison of those objectives with actual results, is contained on Exhibit IIA-2 on the following pages. A review of this comparison will reveal significant differences between objectives as projected in the initial papers, and those which subsequently developed and which were addressed during the course of this project. It will also be noted that the Project Paper indicates the life of the project as 3 years, whereas the actual contract and project life span was only 2 years.

The PIP was designed to be national in scope. It encompassed every activity related to the poultry meat and egg sector in Egypt. It involved the active participation of up to 40 poultry specialists and experts, as well as experts in several disciplines unrelated to poultry, from both the United States and Egypt.

The ultimate goal of the PIP was to generate the basic elements of a National Poultry Plan that would make the Egyptian population self-sufficient in animal protein, as represented by poultry meat and eggs, in the forseeable future. A significant part of this overall goal was to develop for the Egyptian authorities involved in poultry meat and egg production, the necessary "tools" to make improved decisions regarding future resource allocation.

The initial phase of the PIP, begun in the fall of 1978, was one of discovery. This phase included comprehensive sector analysis and resource availability and utilization. Since Egypt, like many developing countries, lacked adequate market and operational data necessary for decision making in large-scale resource commitments, an in-depth data accumulation and assessment program was initiated to establish a data base.

Based on information gathered during the discovery phase of the PIP, specific programs, where applicable, were recommended. And, where practical, were immediately implemented. In situations where the implementation required policy decisions, long term strategic planning or large-scale funding, team members worked with government officials of both the Egyptian government and (USAID) in Cairo to achieve the desired results. The team concentrated, in its initial field efforts, on identifying the actual situations existing in Egypt, and obtaining verifying data from which a viable situation analysis could be completed. Technical assistance was provided continuously throughout the project whenever contact was made with Egyptian members of the poultry sector, and data updated throughout the life of the project.

PROJECT PAPER	MATHTECH PROPOSAL	PROJECT TASK NUMBER	ACTUAL EFFORTS/WORK BY MATHTECH PROJECT TEAMS
•SECTOR ANALYSIS/ASSESSMENT	•DEVELOPMENT OF DATA BASE -- ECONOMETRIC/LINEAR PROGRAM MODEL	020	•DEVELOPMENT OF DATA BASE -- ECONOMETRIC MODEL
	•SECTOR ANALYSIS	030	•SECTOR ANALYSIS -- TOTAL SYSTEM INFRASTRUCTURE -- POULTRY SECTOR ECONOMICS -- IMPACTS ON NATIONAL RESOURCES •MARKET REPORTING & STABILIZATION PROGRAM
•HATCHERY EXPANSION (FAYOUM, SAKHA, INSHASS)	•DEVELOPMENT OF SPECS •COORDINATION OF BID SPEC CONFORMANCE •COORDINATION OF U.S. EFFORTS	090	•DEVELOPMENT OF SPECS •COORDINATION OF U.S. EFFORTS
•BREED & HATCHERY IMPROVEMENT	•BREED EVALUATION & ASSESSMENT •HATCHERY ASSESSMENT	040	•BREED ASSESSMENT •HATCHERY ASSESSMENT •ALTERNATE PLANS FOR IMPROVEMENTS •BREED PERFORMANCE TEST PROGRAMS
•NATIONAL PLAN FOR POULTRY VACCINES & PHARMACEUTICALS	•EGYPTIAN MANUFACTURE & SUPPLY OF POULTRY VACCINES & PHARMACEUTICALS •IMPORTATION & EXPORTATION OF POULTRY VACCINES & PHARMACEUTICALS	070	•ASSESSMENT OF LOCAL MANUFACTURING FACILITIES & PRODUCTS •ASSESSMENT OF REQUIRED SUPPLY •ASSESSMENT OF IMPORTED SUPPLY QUANTITIES & CATEGORIES •IMPACT ASSESSMENT OF VACCINE & PHARMACEUTICAL SITUATION ON PRESENT POULTRY HEALTH •UTILIZATION •DISTRIBUTION OF VACCINES & PHARMACEUTICALS •U.S. COMPANY INTERESTS •POULTRY HEALTH PLAN •REQUIRED IMPACT PROGRAMS TO IMPROVE MORTALITY/PRODUCTION OF EGGS & POULTRY MEAT

PROJECT PAPER	MATHTECH PROPOSAL	PROJECT TASK NUMBER	ACTUAL EFFORTS/WORK BY MATHTECH PROJECT TEAMS
•VILLAGE FLOCKS	•VILLAGE FLOCKS -- CO-OPS	060	•VILLAGE FLOCKS •NATIVE HATCHERIES •PURCHASE OF EGGS & DAY-OLD CHICKS AND DISTRIBUTION/MARKET OF EGGS & POULTRY MEAT •CO-OPS •DONOR GROUPS •EXTENSION/VET SERVICES •PROPOSED VILLAGE FLOCK PILOT PROGRAM
•GENERAL POULTRY CO. (GPC)	•GPC (PUBLIC SECTOR) •PRIVATE SECTOR (INDEP.PRODUCERS) •AGRARIAN REFORM	050	•GPC •PRIVATE SECTOR -- INDEPENDENT PRODUCERS -- GOVERNORATE PROGRAMS •AGRARIAN REFORM •ORDEV •FOREIGN INVESTMENT
		055	•FEEDS AND FEEDSTUFFS •GRAIN IMPORTS/FEEDSTUFF IMPORTS •LOCAL SUPPLIES/SHORTAGES •MILLING: CAPACITY & CONDITION •FORMULATIONS/QUALITY CONTROL •IMPACT ON PRODUCTION OF EGGS & POULTRY MEAT
(TRAINING)	•TRAINING PROGRAMS -- MOA -- GPC -- ORDEV	080	•TRAINING PROGRAMS -- MOA -- GPC -- ORDEV -- AGRARIAN REFORM

A few of the major constraints are:

-----Insufficient arable land

-----Generally insufficient available funding for support of any project regardless of its importance or the critical nature of its desired success

-----Substantial quantiities of existing arable land are devoted to cotton production since cotton is a primary source of foreign exchange, and to production of clover primarily for the water buffalo population.

-----A rapidly growing human population presently estimated at about 40 million and projected to increase to over 70 million by the year 2000

-----A highly developed bureaucracy which because of its size and context tends to frustrate program participants and progress.

Agricultural planners and policy makers in Egypt continually search for food production in activities that-

-----are not land intensive (arable land)

-----are not heavily capital intensive

-----do not rely on massive imports of raw materials or other commodities

-----have a relatively short "turn-around' time

-----represent least-cost production consistent with maximum efficiency/ yield

Poultry meat and egg production fits these criteria and therefore receives considerable attention from the government and MOA as a prime source of protein for the people of Egypt. The minimal accepted international standard for high quality annual protein is 12 Kilos per person per year, with current Egyptian consumption estimated at 4 Kilos per person per year. Poultry product is projected to make up the majority of this existing deficiency.

Notwithstanding the considerable investment by both public and private sources, the poultry meat and egg industry in Egypt has not yet succeeded in meeting the basic needs for protein in the Egyptian diet. The industry has not been able to establish a supply of product sufficient to maintain stable prices. The demand, as perceived by government officials, far exceeds supply. But the question inevitably arises that even if the supply did meet the demand, do the Egyptians have the purchasing power to buy? Even in a subsidized poultry meat and egg

market, current data in per capita income and spending patterns cast doubt on the ability to buy.

The scope of the supply of poultry meat and eggs from all sectors, ie., the public sector, the private sector and the village flock sector has only recently been documented by this project. The scope of demand is poorly documented. But as per capita income of Egyptians increase, even though starting from a relatively low base, the demand for quality food and in particular, quality protein such as poultry meat and eggs....should increase substantially.

4. INDUSTRY CHARACTERISTICS

The Egyptian poultry meat and egg industry consists of several sectors engaged in the production of these products.

a. THE VILLAGE FLOCK SECTOR

When the PIP began in late 1978, little was known about this sector. Primary efforts by all task-teams have been directed toward a better understanding and the accumulation of a data base for this sector. This sector was, and still is, the largest producer of poultry meat and eggs in Egypt. Current figures (early to mid-1980) place the total number of chickens and other fowl at over 100,000,000. This figure is, however, misleading because the actual number of chicks produced, ie., hatched at the native hatchery level and in a few modern hatcheries, is probably closer to 200,000,000. It is estimated that about one-half of the poultry meat and 90 per cent of the table eggs consumed in Egypt are produced by the village flock sector.

The reason for this enormous discrepancy between the number of chicks hatched in actual practice in a year, and the statistical number entering the data base, is that the mortality rate from various poultry diseases is in the 50 percent range!

To assist participants in the decision making process, MATHTECH developed an Econometric Model of the Egyptian poultry meat and egg production in Egypt designed primarily to enable decision makers to weigh alternative resource allocation strategies, and determine the most cost-effective efficient means to achieve results before commitment of scarce resources.

BACKGROUND

Reports from U.S. government, Egyptian government and from private sources indicate that while Egypt could most likely become self-sufficient in food (particularly protein), the facts are that constraints present in Egypt inhibiting the drive toward self-sufficiency, are enormous.

It quickly became obvious that a strong and logical target for near-term productivity improvements at the village flock level was in the control and elimination of the major diseases infecting these flocks. The vaccine-pharmaceutical task emphases was expanded to make Poultry Health programs the primary thrust, with the original objectives of the task modified to less significant status.

A basic rationale underlying the whole of the PIP was the proposition that Egypt 's egg production (both hatching eggs and table eggs), as well as poultry meat production, could be expanded most significantly by creating an environment to more use efficiently the considerable infrastructure already in place throughout Egypt.

There are approximately 5000 villages and about 650 native hatcheries in Egypt. The existing infrastructure consists of a network of native hatcheries; local household growers; hatching egg "marketing specialists;" a vast table egg marketing structure; a large number of experienced, though small, poultry meat producer; low cost labor throughout the infrastructure; feed from government mills (some "free") and other subsidies; and a sales "organization" consisting of local pharmacies who handle everything from feed to equipment, to pharmaceuticals and feed additives.

There has been a long history of effort to upgrade and improve efficiency in the village production of poultry meat and eggs. The activities and customs of the native hatcheries have changed little over the past 5000 years. It is a traditional occupation usually handed down from father to son. Essentially they are still doing things pretty much as they did 5000 years ago!

A considerable number of inefficiencies exist in the production chain of poultry meat and eggs at the village level. If these constraints to productivity could be alleviated by the use of many modern poultry management practices, significant increases in productivity could be achieved. Although the results achieved through these hatcheries are not nearly as desired, they are an established and essential part of the existing infrastructure. And, without these hatcheries, village flock/rural poor poultry production could not now exist. Therefore means must be implemented to support them and improve their results, until such time as the means or desire to replace them can be developed.

The major constraints to increasing productivity at the village flock level are:

1. Native breeds of chickens not "tuned" (by modern genetic practices) for maximum egg lay and feed efficiency
2. Lack of balanced feed rations, generally, containing the ingredients for efficient use of feed and specific layer rations to encourage maximum lay.
3. Poultry diseases, particularly pullorum and Newcastle diseases, which kill up to 50 percent of all chicks hatched. There is an insidious side to these disease exposures in that birds that survive many diseases, generally are stunted in growth; do not utilize even proper diets in growth/feed conversion ratios; and frequently succumb to the primary infection or the secondary infections because of poor resistance. This mortality picture is often seen later in the life of the bird, after many scarce resources have already been used to bring it to that stage of life. This is the most expensive time to lose the bird, which most often may not be safely edible because of the disease.
4. No organized or coherent local or national programs of instruction or extension service exist to work with the villagers in techniques to improve their productivity. That which does exist is extremely short on authorized staff, facilities, equipment and operating budget.

While some of the village flocks are, in fact, "scavenger" operations, i.e., the household flock eat table scraps and whatever they can find or "scavenge" in the yard of the village. Most are not. Most are confined within the village or household. The housewife, who is the real "producer" at the village level, recognizes that proper feed is necessary for growth and egg production. She also is generally cognizant of the necessity for vaccinations and medications to attempt to control the many disease conditions that decimate her flock. Various figures have been reported for egg production at the Village flock level. These vary

from 50 to 100 eggs per hen per year. This is quite low when compared with "average" egg production numbers in a properly managed layer operation of over 250 eggs per year per hen.

The growing, selling and "bartering" of eggs..and to a lesser extent, poultry meat...is an active enterprise in the villages. Virtually all households keep poultry, and the selling of the eggs and meat provides a valuable source of money for the purchase of other family necessities. Since much of village production ultimately is marketed in urban areas, when these urban areas suffer price problems in poultry, these village producers suffer disproportionately.

By whatever means of analysis which may be used, and despite the low productivity, the production of poultry eggs by the village housewife must be considered a vital factor in their family's economics. Through the application of at least some of the existing technology in poultry meat and egg production, it would be possible to effect substantial incremental increases in the productivity of the village flocks without the expenditure of extraneous sums of money. The favorable impact on the village flock owners economy should be substantial.

A fairly simple "package" of appropriate technology for improving village flock performance might, for example, consist of:

1. The introduction of more efficient breeds of chickens.
2. The introduction of disease prevention and control programs.
3. The introduction of better and more balanced feed rations, at least until the chicken involved is "full size"...approx. 8 to 10 weeks of age. At that time, the chicken should be sufficiently developed so as to withstand conversion to local ingredients... table scraps, etc.
4. The introduction of educational and training programs to provide the "conduit" to the villagers for present and future measures to improve their productivity (Extension services, etc).

While the logistics of the above programs may seem formidable, there is the distinct advantage of cost effectiveness if practiced in part or incremental steps. As incremental improvements are realized, more resources are available to the villager to apply to subsequent practices that will further improve his or her position. Its sort of a "pay as you go" plan.

There do not appear to be any social or "traditional" restraints associated with the such project activities, and the overwhelming majority of the villagers approached during the past two years of the PIP appear to be receptive to such changes which would improve their "lot", providing such changes are not cost prohibitive. Although their funds are more limited than with larger scale producers, they have the means and will purchase feed and vaccines when available at reasonable prices.

The rationale set forth for implementing these recommendations for improvements in the village flock productivity might argue for moving ahead on a less modest scale. The constraints are not related to doubts as to the validity of the recommendations or of the soundness of the data base. But, instead, are based on the total lack at this time, of the existance of a National Plan. More specifically, the introduction of tangible items such as vaccines, pharmaceuticals, adequate feed rations; and intangible items such as educational and training programs into the villages, has not proceeded as rapidly as desired because there simply is not in place a "delivery system".

The "delivery system", as used in this context is a nationally organized complex. It is generally within the jurisdiction of the Ministry of Agriculture. It consists of technical service programs, veterinary programs, extension service, feed specialists, as poultry disease specialists supported by necessary laboratory and other equipment such as transport vehicles. Essentially, all that would be necessary to bring the services to the villages, to apply training and instruction as well as the specific use of vaccines, feed rations, and the like. This system,as noted previously, is quite deficient at the present time in Egypt. Development will require establishment of an improved "delivery system" in Egypt. It will require, basically, two things; a dedication to making the "system" work, and funding. Unfortunately, both are lacking to varying degrees, and are completely outside the means of those currently operating the exising system.

b. THE PUBLIC SECTOR

Whenever the public sector is mentioned in Egypt the reference usually concerns the General Poultry Company (or GPC). The "Public Sector" refers to government, whether it be local or federal. The GPC is operated as an agency of the Ministry of Agriculture.

Because of the dominant position of the GPC in technology, funding, and its extensive scope of operations the MOA requested USAID to provide technical assistance to GPC, for the purpose of increasing GPC's operating efficiency. The project team, soon after project startup, expanded the scope of its operations to include those segments at the Egyptian poultry sector for which GPC also bears responsibility. These are all private sector poultry producers, other government poultry programs such as Agrarian Reform, and the "late-in-the-project Governorate programs.

GPC identified three broad areas in which technical assistance was desired.

1. Feed formulation and manufacture.
2. Disease prevention, control and general sanitation programs.
3. General management practices, including training.

As subsequently identified in the project, the nature of the GPC is such that it enjoys a broad latitude to carry out its mandate of producing poultry meat and eggs. It pursues the government's policy of providing better quality protein, in greater quantities and at a reasonable price to the Egyptian people. There is no comparable organization in being as concerns red meat, dairy & fish... although there are groups identified as existing for those purposes.

Since GPC is government-subsidized, it appears little attention has been paid realistically, to improvement of production efficiencies, or the more economic uses of resources allocated to the enterprise. Although operating as a production unit under the general jurisdiction of the Ministry of Agriculture, in pursuing its own needs, GPC must achieve its feed and commodity requirements through the Ministry of Supply, and its budgetary requirements through the Ministry of Finance and planning. These procedures create for a cumbersome and inefficient control of its own destinies and results. Further, GPC bears responsibility for profiding such support to the balance of the private poultry production sector as well.

c. THE PRIVATE SECTOR

Only within the past five to ten years has the private sector become a factor in the production of poultry meat and eggs in Egypt. Because of prior government policies related to private investment which varied from discouragement to outright prohibition, there was no opportunity or incentive for the investment of private capital in the poultry industry of Egypt.

The private sector has grown, but by "fits and starts". It produces approximately 25% of the poultry meat produced in Egypt, and less than 5% of the Table Eggs. However, the latter should change significantly as the table egg projects in the governorate programs develop.

While the thrust of the major efforts of the PIP are not directed toward the private sector, according to instructions from both the GOE and USAID, a data base was developed for and attention given to this sector. This was necessary since the sector does play a vital role in the overall poultry industry in Egypt. All large, and significant sampling of the private sector producers in Egypt were visited during the project and their operations analyzed .

The major constraint to the development of the private sector is an unstable market. The supply side, from local production and imports, was identified. The demand side is open to conjecture, primarily because of the often wild gyrations in the market place.

The team conducted a MARKET STABILIZATION STUDY encompassing the year 1979. Recommendations were made, as an example, to GPC to control production as well as the distribution of finished product, particularly in Cairo, the largest urban market in Egypt. Results of that study confirmed that the major problems contributing to the instability of the poultry market in Egypt, are correctable and which substantially improve the probability of private sector growth.

Further recommendations were made regarding CIP (USAID) - Commodity Import-purchases of poultry (broilers) from the U.S. These are made with U.S. supplied CIP funds, through the Ministry of Supply generally in amounts of 2500 metric tons. Unfortunately they are not coordinated at all with poultry production plans, the market situation, or even with supplier situations. They are purchased at regular intervals throughout the year, and released to the market as recieved.

It is easy to see why chaotic market conditions are created when the private or public producer goes to the marketplace with product at the same time that the Ministry of Supply "dumps" thousands of tons of "dressed" broilers on the same market at the same time. Many Egytians of entrepreneural spirit, entered poultry production business with high hopes of profits, only to be bankrupted overnight by such dislocations in the marketplace. This has also occurred when large private producers release large volumes of product to the market within a short period of time.

From the inception of the PIP, the team worked to identify and analyze the major economic factors which impact poultry production and marketing in Egypt. In the absence of a healthy and viable private sector, the public sector (principally GPC) has been required to devote substantial resources in manpower and scarce funds to satisfy as best as was possible, the food requirements of the Egyptian people. The lack of a centralized control and plan by which poultry production burdens would yield optimum production, is regularly evident when the high degree of sub-normal utilization of resources is analyzed.

Despite overall growth in poultry production during recent years, Egypt's poultry industry continues to experience too many problems. The cost to both the public, private, and village sectors has been intolerably high. Major problems with diseases, shortages in feed (as well as quality), an overall lack of training and education in effective poultry production technology industry.

The basis for many of these problems is considered to be the absence of a viable, centralized data base from which good decisions can be made. It is impossible for any manager, regardless of how well trained, to make good decisions without reliable comprehensive data. Even to the end of this project, in spite of project efforts and centralization results, there still did not/does not exist an appropriate data system capability.

It should be stated that the problems experienced by the Egyptian poultry industry and the underlying causes are not unique to Egypt. The U.S. industry experienced many of the same kinds of problems 40 to 50 years ago. Similar problems have been identified in other developing countries as well in recent years. Fortunately, this situation is correctable but requires acceptance of the problem, and changes in the responsible infrastructure, neither of which were evident during or at the conclusion of the project.

It is interesting, and sometimes useful, to draw parallels between the poultry industry in Egypt and in the U.S. This is particularly true in the establishment of realistic goals. It is understood that the solutions to Egyptian problems must be based on an understanding of the dynamics and constraints of the Egyptian poultry industry, not any other poultry industry. Solutions to problems in the U.S. or elsewhere may well be useless in problem solving in Egypt.

As previously mentioned, the production of poultry in Egypt falls into three sectors:

-----the public sector, about 25%
-----the private sector, about 25%
-----the village sector, about 50%

The public sector (represented principally by GPC) and the private sector primarily sell their poultry meat and eggs into the large urban markets such as Cairo-Alexandria. While villager producers may consume a large portion of the poultry they produce, the sector analysis and village flock study teams determined that a significant portion of their production is sold in the same urban markets as GPC and private sector production.

This project verified different economic problems relating to unstable, sometimes chaotic, wholesale prices received by Egyptian producers and the impact on all three major production sectors. When production costs were high, they were high for all producers. When feed ingredients were scarce or expensive, every production segment experienced serious problems which complicated and increased total production costs. Unfortunately, the smaller the producer such as the small private and village producers, the greater the negative impact.

The simple fact is most smaller producers cannot afford to maintain production cycles once they experience losses from selling their product at a price less than their cost of production. Resultingly, this valuable production resource is lost, overall industry growth is stunted, and the burden of overcoming any subsequent production deficit falls on GPC.

Attempts by GPC to "make up" such lost production, creates erratic "crunches" on their resources, and causes significant increases in their cost of production. This creates inevitable budget deficits and higher cost to the central Egyptian government from which GPC receives its financial support.

A number of specific factors causing such losses (as related to production cycles/ market supply-demand) were identified. These problems can be corrected. Prompt initiation of carefully planned activities aimed at improving the present situation and encouraging future growth is essential if:

-----the Egyptian people are to receive the same or increasing amounts of poultry meat and egg products in future years

-----limited Egyptian resources are to be effectively utilized

-----the private sector is to grow, and increase its share of the domestic poultry production market

-----a large number of village poultry producers will not be placed in a position where they must endure undue hardship due to instability of wholesale poultry prices in the urban markets.

-----excess production costs to GPC, with resulting budgetary deficits, are to be reduced or eliminated

Another major constraint to effective planning of the growth of the poultry industry, is the lack of a data base on livestock production. Egypt's population growth is presently approximately 2.6 percent per year. This results in a substantial increase in demand for cereal grains to feed both the human and livestock populations. Egypt is already severely strained in its capacity to produce sufficient quantities of cereal grains domestically, or to import currently necessary supplemental requirements. An ever-widening gap between overall demand and domestic supply, forces the government to import grains at significant expense of depleting already severely limited hard currency reserves.

Unfortunately, the lack of a reliable data base on production and supply/demand factors critically hampers the ability to project the needs for the human as well as livestock and poultry population. To effectively satisfy demand, grains (as well as other commodities) must be available in the proper quantities at the appropriate locations at the right time and at an acceptable price. These criteria can be satisfied only through careful centralized planning which must be based on a reliable data base not now existing.

B. CURRENT SITUATION (1979-1980)

1. The distribution of poultry meat in heavily populated urban primary markets lacks the coordination necessary to ensure stable wholesale prices for producers. Large fluctuations in the wholesale prices cause financial losses to GPC, for the smaller private and village producers.
2. Wholesale prices paid to producers drop substantially whenever poultry product on the market is at a level above that of its "take-off" capacity. Again, it is the small producers who must market through five independent distributors,or brokers,or "in the streets" directly to the consumer, who suffer the severest losses. Since most poultry product is sold "live", when supply exceeds the "demand" (the ability of the market to absorb / pay for the product), pressure develops on the producer to sell at unprofitable levels. often below production costs.nnn
3. As the supply of poultry increased, wholesale prices paid to the producer decrease. As supply decreases, wholesale prices increase dramatically. These increase perhaps as much as 35 percent, compared with 15 to 20 percent fluctuations in the U.S. marketplace. In Egypt, retail prices tend to remain relatively stable regardless of supplies, or they increase. Yet, when retail prices do increase (due to short supply), the retail price rarely falls again during any subsequent period.
4. There have been several instances of an overabundance of poultry meat in the Egytian marketplace during recent years. One of the reasons for such overabundance is the limited slaughterhouse and refrigerated storage capacity, and the inefficient use of existing facilities. There is a sufficient slaughterhouse capacity in Egypt to effectively regulate the amount of poultry flowing to the marketplace. Unfortunately, the existing slaughterhouses are utilized at only 15 to 25 percent of capacity compared with an "average" figure in the U.S. of 95 percent or better. There is no plan or infrastructure existing by which market supply can be adjusted to market "take-off" levels.
5. There continues to be an unfortunate tendency to misuse and misinterpret the word "demand" when applied to the Egyptian market. While there is a high "desire" to buy poultry, the financial ability of Egyptian consumers is limited. Also, the number of Egyptians with home refrigerator space is minute. Therefore, not many consumers are in position to make and store future purchases at home. Most purchases are made only for today's or very near future consumption.

6. Unit purchases in Egypt are generally whole bird-live. Therefore, the market is essentially limited to those consumers with available money to purchase whole chickens. Many less affluent consumers may have only enough cash to purchase "part" of a chicken; therefore they are often forced to purchase alternate food. Cut-up "parts" of chickens are simply not available in Egypt. In developed countries, the "parts" market comprise a significant volume of poultry meat sold at retail. It is interesting to note that, in initial preference inquiries, consumer preferences are for "parts".
7. The lack of information on market supplies and prices, as well as an almost total absence of planning to coordinate supply and demand cycles, creates nightmarish problems for the Egyptian poultry sector. This results in unbalanced and highly erratic demands on supplies of primary feed ingredients such as maize, soya and fish meal. Again, as such conditions occur, costs escalate and production efficiency suffers. Balancing of such factors would most likely yield considerable improvements in production efficiences and resource utilization.

1. MARKET STABILIZATION STUDY CONCLUSIONS

1. The private sector will continue to have major problems obtaining levels of profit necessary to motivate input of private capital until wholsale market prices can be generally stabilized.
2. GPC production can be effectively used to stabilize the wholesale market, with resulting prices paid to private and village producers. Such a program would not negatively affect GPC's operations. In fact, it should impact GPC operations in a positive manner by providing more "cushion" on input/output factors.
3. It is essential the Ministry of Supply's program of importing frozen poultry, must be coordinated with domestick poultry production managed by the MInistry of Agriculture. These two programs must be well coordinated.

2. FEED & NUTRITION

After the start-up of the Poultry Improvement Project, the team became increasingly aware of the major constraints on poultry production that existed because of the feed situation in Egypt. Although an extremely productive agricultural nation, Egypt had thus far been unable to produce all of the cereal grains and other major ingredients required for balance poultry, livestock and dairy cattle rations. To meet its needs, Egypt imported considerable quantities of maize, soya bean meal, and fish meal -- all essential ingredients for poultry rations. Unfortunately,

these same ingredients are used (in varying quantities and rations) for livestock, dairy cattle, and human nutrition as well as for poultry. During 1980, the major portion of soya bean needs were produced domestically. However, as poultry production increases, it is questionable if soya bean production can keep pace with those needs, considering the shortage of arable land.

As the initial "discovery" phase of the Poultry Improvement Project progressed, it became apparent the feed problem required special attention and effort from the team. Originally, feedstuffs and poultry nutrition problems had been the responsibility of the Poultry Production Task Team, but subsequently these problems were placed under a separate task. To fulfill the special needs of this task, experts in the fields of Poultry Nutrition and Feedstuffs were added to the team expressly to concentrate on these areas. They were assisted by a broiler production expert; a breeder production expert; and other team members in gathering all existing data regarding the feed situation in Egypt, and in analyzing the situation to the maximum extent possible. These efforts were not included in the original Project Paper, RFP or contract; they were considered so critical and essential to practical project completion, they were added to the project. The budget was adjusted to satisfy the needs of these additional experts, and to reflect their inclusion in the project. It was necessary to reduce budgets in other task areas to accomodate these additions.

It was obvious to the entire team that feed constraints throughout the poultry sector. were a major factor in production costs, as well as in the growth of every sub-sector of the Egyptian poultry industry. Team members were repeatedly advised hatchery capacities were not being utilized because not enough feed was available to support the parent breeder stock. Problems were said to exist in the villages because the Veterinary Extension Service and Village Sector received significantly less than their required feed allocations. Private sector producers stated they had problems in obtaining sufficient feed and rations formulated according to the needs of their flocks.

Because shortages existed regularly for various ingredients formulations were not always prepared according to plan. Producers used whatever ingredients were available, appropriate or not, and productivity reflected these deficiences. There was no central control inventory of ingredients, or formulation/nutrition assistance available to the poultry sector in general..only in limited areas of production.

Feed conversion rates were found to be higher than should have been the case. Broiler meat productivity was lower than normal. And egg layer production rates were lower than should be experienced. It was obvious from supplied statistics, that shortages of major feed ingredients would continue to be a primary constraint to poultry industry expansion. And, unless resolved, would restrict achievement of desired levels of production, and would result in continuation of excessive production costs.

A major effort was launched to develop a practical capability to overcome these problems through the use of available Egyptian resources, However, it was apparent available resources would not be enough, and some additional means of providing the necessary technology and assistance to Egypt would be required. Therefore, the team expanded its efforts to identify sources outside Egypt which might most economically and rapidly help Egypt resolve cereal grain and animal feed problems. Two major U.S. firms were introduced to Egypt for those purposes, and discussions were still underway at the end of the project.

BACKGROUND

The major responsibility for supplying feed ingredients to the Poultry sector of Egypt is with GPC. It happens GPC produces approximately 25% of all poultry in Egypt and, therefore, is the largest single user of feed in the Egyptian poultry industry. Additionally private sector producers look to GPC and other government sources to provide proper mixed & milled rations for their flocks. Other government agencies involved in the Poultry Sector (such as APRI, ORDEV and Agrarian Reform) also look to GPC as the primary source for poultry feeds.

To fulfill such needs within the available budget, the estimated annual needs for major feed ingredients are put forth on annual tender. Bids are submitted by any organization capable of fulfilling the tender; bids are evaluated; and contracts are awarded on an annual basis. Additional ingredients are then provided from Egyptian stocks, and processed in Egyptian feed mills into specified animal rations. This procedure tends to eliminate any benefics available when international supplies may be in surplus and/or at best prices and/or at best nutitional levels.

Formulas used to produce these rations are generally supplied by the "nutitionist" of the organization operating the mill (GPC, ORDEV, MOA, Agrarian Refor the EXTENSION-VETERINARY SERVICE, etc.). Available feed supplies are milled as closely as possible to the specified formula and the rations then provided to the producer's flocks. However the rations many times are not formulated for any special purposes, and tend to be less effective general purpose formulations. Poor quality milling is also a problem, due to equipment and management deficiencies.

Once milled, rations are generally "bagged". That is, they are packed in various types of sacks for storage until used. In many instances, sacks are stored without proper protection; are exposed to the elements; and are not stored in vermin-proof structures. Therefore, the formulated feed as well as individual ingredients are subject to deterioration and pilferage as well as to infestation by pests, rodents and birds. Even when properly formulated and milled, these rations suffer a 10-30% deterioration of value due to improper storage handling and safekeeping. The longer such ingredients or rations are stored under such conditions, the greater the deterioration.

Almost all feed ingredients and finished feed used in Egypt are handled in bags. There is only a severely limited capability to handle materials in bulk. While plans are in process to overcome such problems, capital investment requirements are high and progress is necessarily slow.

No such facility existed in Egypt which could provide the poultry sector with essential ingredient and ration analysis. Team members acquired samples of feed being used, and sent or brought to feed laboratories in the United States or other countries for analysis. Recently, a new small protein analysis laboratory with limited capabilities, has been put into operation in Gasira which will help, but not resolve, this problem.

Team members visited and inspected every feed mill in Egypt to determine condition, capability and output. Formulas used for the rations were obtained and analyzed. It was found that only relatively few formulas were used, in contrast to the practice in countries with developed poultry production efficiences. Least-cost feed formulas -- very popular and essential in most successful poultry production complexes elsewhere -- are generally not in use in Egypt.

3. CURRENT FEED SITUATION

1. The current procedure in most Egyptian poultry programs is to completely formulate the ration at the mill; that is, combine vitamins, minerals, and all other ingredients during the milling process. This requires the necessary supplies of all required ingredients be available at the time of milling. Further, the mills must be in good condition and must effectively use good operational procedures. These situations do not generally or universally exist.

2. A detailed review and analysis of feed mill operations indicated problems regarding equipment effectiveness. In almost every mill mechanical defects were identified which significantly affected that mill's ability to effectively process the required ingredients into a properly finished ration. In many instances, these deficiences resulted in feed rations which, even when accurately formulated, were either not sufficiently edible by the poultry they were intended to feed, or were rejected (e.g., "billed out") by the poultry. This resulted in a major waste of scarce and expensive ingredients.

   Most GPC mills were not in this category and were significantly better in operational capability and results. In almost every other mill, considerable mechanical improvement is indicated, with improvement in mill management and operation urgently needed for acceptable and effective production results.

3. In all of the analyses conducted on feed samples from Egypt, the universal result indicated the ration was significantly under or overformulated. When overformulated, the ration contained significantly more protein than normally required. The same basic formulations were used without regard to the age, type of breed, or growing situation of the birds involved. In almost every instance, the ration seemed to contain all, or most, of the necessary ingredients. However the ingredients were not in proper proportion. It appeared a relatively minor reformulation would have resulted in a superior ration. Usually, one of the ingredients, although perhaps of minor consequence, was significantly out of proportion to the norm. These analysis indicated the major problems did not involve ingredient shortages, but rather utilization and milling of the ingredients.

Further, laboratory analysis indicate improper formulation, inefficient mill management, improper use of available ingredients essential to proper nutrition, and inefficient use of available ingredients. In all analyses, waste factors appeared high. Overformulation is, of course, the most costly. When excessive protein is used, it tends to have a debilitating rather than having a beneficial effect.

4. There appeared to be no inspection of qualitative standards for either imported or Egyptian feed ingredients. Feed sample analyses indicated basic ingredients often did not meet minimum nutritional standards. Even when ingredients were properly formulated, effectively milled, and transported to the production site...if the basic nutritional content was not initially present, then nutritional needs of the poultry would not be satisfied under any condition.

5. Generally speaking, concentrates are not widely used in the formulation and production of poultry rations in Egypt. This is in contrast to successful practices in most of the effective poultry industries in other countries. It is also in contrast to the conditions and management capabilities existing in Egyptian mills. Greater use of imported concentrates would tend to overcome ingredient and milling problems, since it assures proper nutritional content of the ration. Domestically produced concentrates were also analyzed as deficient, and tend to suffer from the same production problems as the rations.

6. There did not appear to be any effective coordination between the needs of the Poultry sector and the other nutritional programs in Egypt (livestock, dairy and human). The limited Egyptian resources of cereal grains in animal feeds creates major problems in the effective allocation of these resources to best satisfy the needs of the various programs.

7. There is no existing central point at which problems relating to feed and its allocation may be coordinated for most effective use of these scarce resources.

4. CONCLUSIONS REGARDING FEED

1. Considerable progress can be made toward more effective utilization of existing feed resources through the implementation of appropriate national and/or sectoral programs which encompass all major users.

2. An approximate 15 to 30% decrease in major feed and cereal grain requirements is possible through reduced waste, improved management, increased milling efficiencies, mechanical and management practice improvements in the mills, and more appropriate feed formulation for specific needs.

3. A combination of outside resources and better utilization of Egyptian resources will be required to accomplish feed optimization in Egypt.

4. Requirements and allocations for livestock, dairy and human nutrition programs must be interrelated with requirements and allocations for the poultry sector if any program of feed optimization is to be effective.

5. FUTURE FEED STRATEGY

1. Obtain the cooperation of a major international feed supplier to provide the needed services by which main problems relating to feed optimization can be overcome in the shortest possible time without significant capital expenditure by the GOARE.

2. Whenever possible and economically feasible, use concentrates to overcome mill and primary ingredient deficiencies.

3. Use an appropriate least-cost feed formulation program to optimize locally available feed ingredients and to reduce reliance on imports.

4. Eliminate or substantially improve deterioration problems and other factors which increase the cost of feed to the producer. Feed represents more than half the total cost of any poultry product, regardless of how efficient poultry production practices may be. This may be accomplished through improved storage and management.

5. Overcome feed constraints as soon as possible in order to allow the fastest possible development of Egyptian-produced poultry products.

6. Develop and implement a master feed optimization to ultimately include a cropping program.

C. POULTRY HEALTH

It became obvious to members of all teams, that diseases are one of the major problems, if not the major problem, facing the developing poultry industry in Egypt. Two diseased, Newcastle and salmonellosis, including pullorum "typhoid and pentatyphoid" are the major two disease entities plaguing the industry. Obviously, other diseases exist, but are overshadowed by the devastating effects of Newcastle & salmonellosis. This disease picture is true in all three segments of the Egyptian poultry industry; public, private and village flocks.

The velogenic viscerotropic neurotropic varieties of Newcastle disease (VVND) virus were found to be prevalent in Egypt. These varieties cause morbidity and mortality up to 100% in unvaccinated flocks. Irregularly vaccinated flocks can also suffer high morbidity and mortality. The regular use of high quality vaccines, similar to those used in the Western World, provide good protection against the velogenic viscerotropic varieties of the virus. Reports of good control of the disease achieved by the use of imported vaccines were heard from General Poultry Company (GPC) personnel and some owners of private flocks.

1. IMPORTANCE AND VARIETY OF DISEASES

Salmonellosis is apparently a real problem in flocks of different sectors. Paratyphoid infections are very common in public and private sector farms. Although no data is available on the incidence of these infections in village flocks, there is no reason to not believe that these infections are widespread in these flocks. The pullorum typhoid group of Salmonellas was prevalent in village flocks. Salmonellosis can cause morbidity and mortality of up to 100 percent in young birds; in older birds there is very little mortality, but chronic infections with S. pullorum and S. gallinarum can lead to impairment of reproduction performance.

Other diseases recognized on the basis of clinical signs or gross examinations were Marek's disease, lymphoid leucosis, fowl pox, gumboro, avian encephalomyelitis, and airsacculities. The latter condition is probably caused by Mycoplasma gallisepticum and complicated by Escherichia coli. Aspegilleris, spirochetosis, coccidiosis and worm infestations are some of the other recognized problems. Although there is evidence of infection with infectious bronchitis virus, no diagnosis was made of that disease. No reports have been made in Egypt of the presence of infectious laryngotracheitis. There is the possibility that the disease exists but has been misdiagnosed.

Generally speaking, most of the common diseases of poultry encountered in the Western World exist in Egypt. Diseases that do not exist, or are not currently diagnosed, will probably make an appearance as soon as Newcastle and salmonellosis are brought under control. One other reason for this prediction is the free flow to Egypt of eggs and day-old chicks from Europe, where some of these so-called (nonexistent)diseases are common.

2. DISEASE CONTROL MEASURES:

As indicated in the preceding write-up, Newcastle and salmonellosis are the major diseases that an Egyptian poultry pathologist worries about. The 1978 summary of diseases diagnosed by the Central Poultry Disease Diagnostic Laboratory of the AHRI (see 070 report of February 28, 1979) indicated that Newcastle disease virus was isolated from 815 of 1,396 cases believed to be caused by virus infections. Salmonella organisms were isolated from 2,150 or 7,231 cases believed to be induced by bacterial infections. Under the present circumstances, this is a justifiable attitude because of the devastating effect of these two diseases.

Vaccination schedules used for broilers in the public and private sectors vary within farms, as might be expected. The only vaccines used in broilers in Egypt were Newcastle vaccines. GPC, Ismailia, and Egypco use only imported Newcastle vaccines. Most of the private flocks are vaccinated with imported vaccines, but some still use locally produced vaccines.

Layer operations which are mostly GPC owned (with one exception we know of) vaccinate, besides Newcastle for Marek's disease, gumboro, avian encephalomyelitis, fowl pox, fowl cholera, and occasionally for spirochetosis. Except for the spirochetosis vaccine, all the other vaccines are imported. Parent flocks are vaccinated for the same diseases as for layers.

Village flocks which are used as dual type birds, are vaccinated only for Newcastle. Only locally produced vaccines are used in village flocks and only when available. There is a major shortage of vaccines for this subsector.

In discussions with veterinarians from GPC, Ismailia Poultry Company and Egypco, and some owners of private flocks, it became apparent that the imported Newcastle vaccines have contributed substantially to the control of the disease. This same picture is apparently true also of imported vaccines for other diseases used in layers and parent flocks operations. Yet, the fear of Newcastle has created an interesting attitude, not based on much scientific knowledge, in the mind of the local veterinarian. This attitude is expressed in a policy of overvaccinating. As an example, Egypco vaccinates broilers at 7, 18, 28, 38, and 45 days of age. Regardless of this and other minor problems, it seems to us that imported vaccines used properly have significantly contributed to the control of diseases in public and private flocks.

The situation in village flocks is rather depressing. Essentially, the only vaccine available for this sector is the locally produced Newcastle vaccine. This vaccine is not always available, as has been discussed in our special reports. Consequently, it can be stated that disease control in village flocks by vaccination is essentially non-existant.

Control of diseases for which no vaccines are available, such as salmonellosis and mycoplasmosis, is another depressing subject. At the GPC and private flocks level, control is attempted by using a great variety and quantity of antibiotics and chemotherapeutic agents. These drugs are injected or mixed with water or feed and introduced to the birds throughout their lives. In village flocks the situation is even worse. The only drug the MOA can afford to use for stocking its veterinary clinics, is furazolidone. And, for that matter, only very small quantities of it are available.

3. THE QUALITY AND QUANTITY OF LOCALLY PRODUCED VACCINES:

This subject was discussed in detail in this team's earlier report. More information was gained during this visit on the locally produced vaccines at the MOA facility at Abbasia. This information supports the two main points raised in the earlier report; namely, Abbasia is not able to meet the local demand. And the poor safety and efficacy record of the vaccines produced tends to create rather than solve problems. Production figures on the following table are in agreement with data obtained from Abbasia. Requirements figures are debatable. It should be understood these are the requirements of the MOA for stocking its veterinary clinics which vaccinate village flocks. Notice the requirements in the table for the intraocular (F strain) Newcastle disease vaccine is the same as that for the intramuscular (Komarov strain). The F strain is used only for newly hatched chicks (less than one week of age). This indicates that the requirements are calculated on the basis of one F strain and one Komarov strain vaccination during the lifetime of a bird. This is simply inadequate. Obviously, it also becomes clear the requirements figures in the table are severely undercut. There is no vaccine which will provide such lasting immunity.

It becomes clear from these figures and from the available information on the number of poultry in Egypt that Abbasia is not capable of producing NCDV in sufficient quantity to cover local demand.

EXHIBIT II-C-1

POULTRY VACCINES PRODUCED BY THE VACCINE & SERUM INSTITUTE ABBASIA

NAME OF VACCINE	PRODUCTION	REQUIREMENTS
Newcastle *Intramuscular)	109.357.000	150.000.000
Newcastle (Intraocular)	84.554.000	150.000.000
Fowl Pox	8.260.000	10.000.000
Pigeon Pox	450.000	500.000
Haemo. Septicaemia (Rabbits)	200.00	500.000
Fowl Cholera	893.800	8.000.000
Duck Cholera	608.000	1.000.000
Turkey Cholera	288.000	1.000.000
Spirochaete	427.500	1.500.000
Antigens:		
B.W.D. Stained Antigen	334.000 doses	10.000.000
B.W.D. White Antigen	1750	400.000

On the subject of efficacy of the vaccines, we were able to obtain data from one particular flock on this subject. Three month old birds from this flock were vaccinated twice for NC; once using the F strain at five (5) days of age, and another using the Komarov strain at two and one-half (2½) months of age. At 3 months of age an outbreak of NC occured in the flock, and at that time some birds were bled and some were tested for an NCDV antibody titer. The results showed that of 22 birds examined; 6 birds had no titers, 5 birds had 1:2 titer, 5 birds had a titer of 1:4, 3 birds had a titer of 1:8, one bird had a titer of 1:16, and the last two birds had titers of 1:32. These low titers (or lack of titers) are an indication of the lack of efficacy of the vaccine.

Several other reports were recieved regarding the lack of efficacy of Abbasia vaccines. There are also reports on the lack of safety of the vaccines. Several outbreaks of Newcastle reportedly occured a few days following vaccination of birds that were previously vaccinated. As a matter of fact, the team visited one of these farms that was experiencing such a problem to verify the report.

As indicated in previous special reports, the facilities at Abbasia are obsolete and in such rundown condition that it is easy to partially understand the lack of efficacy and safety of the vaccines. Another problem with Abbasia is the lack of a dependable source of eggs to grow live virus vaccines. They do not have an SPF farm essential for such a quality control program. For all practical purposes, the eggs currently used well might be naturally infected by any number of poultry pathogens which could contaminate the vaccine.

Another problem is the choice of the Komarov strain for their vaccines. Although this strain is supposed to be mesogenic, field observations indicate this is a virulent strain.

Because the demand on the locally produced NC vaccine is far exceeding production, a black market for this vaccine has been active. It was indicated that 1,000 doses of vaccine are being sold in the black market for LE 10. This is a substantial amount of money by Egyptian standards. This suggested that some irresposible people are taking advantage of the situation and are overdiluting the vaccine so that they can obtain 1,000 doses or more to be sold in the black market. Certainly, this may be a contributing factor in the failures of the immunity induced by use of locally produced vaccines.

The above observations concentrated mainly on Newcastle vaccine, since these are the vaccines in demand and this is the most virulant disease. The only other viral vaccine produced at Abbasia is Fowl Pox. We were unable to confirm any problems about the efficacy of this vaccine. However, this vaccine is also produced in non-SPF embryonated eggs, and the possibility of its contamination with other infectious agents is real.

It is apparent that some major changes have to be made in the area of vaccine production. There are enormous gains to be made in Egypt which will cost relatively little if a new poultry vaccine production facility is constructed. A small farm for production of SPF eggs should be part of such a facility. The heads of the current poultry vaccine production units are capable people, but the younger generation needs a lot more training on vaccine production than currently recieved. It was the conclusion of the team, it would be less expensive and more efficient to construct a completely new vaccine plant than to attempt rehabilitation of the obsolete Abbasia facility.

4. THE VARIETY AND AVAILABILITY OF POULTRY DRUGS:

Although we have seen a variety of poultry drugs advertised in Egypt, some important drugs available in the United States were not available. Examples of the unavailable products are gentramicin and lincospic. These are very effective drugs that proved their superiority in the United States. There is also a variety of combination drugs manufactured in Europe that certainly would not be permitted in the United States. Examples of these would be combinations we have seen that contain 3 or 4 antibiotics and, for added measure, few amino acids and vitamins are added in another recipe. It was obvious that some of these combinations contain antagonistic ingredients and the interrelationship between other ingredients is unknown. In other words, it is an open market and everything goes. Yet, some of the ethical companies are apparently hesitant about entering this market, and those that did are selling poultry drugs as an offshoot of their human drug sales.

Imported veterinary drugs were taxed at the rate of 23% of the cost. However, it was noted by the Undersecretary of Agriculture for Animal Health that drugs imported for use by any governmental agency, such as GPC and MOA farms, are exempted from this high taxation. This policy does not lend itself to the GOE efforts to expand its human food resources. It is a very high rate of taxation that places a heavy burden on the private producers who theoretically

pass it on to the consumer. As a result of this high rate of taxation, veterinary drugs are expensive; human drugs are relatively cheaper. Consequently, some private producers are buying less effective human drugs to treat their chickens.

Most of the veterinary drugs are sold by the middlemen who are charging exorbitant prices. We were also appraised of a thriving black market in poultry drugs.

As concerns the use of poultry drugs, this is dependent on the industry sector involved. The public sector advertises for bids, and recieves the best prices. Consequently, drugs are available for this use and are definitely overused. The private sector suffers the most in this area, and numerous complaints were given about middlemen putting the squeeze on producers. The village flock sector essentially has very little available drugs. As mentioned earlier in this report, only flurazolidone is "sometimes available" in the MOA veterinary clinics for treatment of salmonellosis.

5. THE POULTRY DIAGNOSTIC FACILITIES AVAILABLE IN EGYPT:

The diagnostic facilities for poultry diseases are operated by the Animal Health Research Institute (AHRI). There is one central laboratory in Cairo, and 18 regional labs distributed throughout the country. Three (3) more regional labs are to be in operation in 1980. Two (2) reports were produced on the personnel involved and some of the disease diagnosed.

It becomes obvious that the diagnostic facilities are functionaing below accepted standards. The central lab is supposed to be the final referral center but lacks space, equipment, reagents and expertise. Yet, it has an overabundance of personnel.

In modern poultry diagnostics, post mortem examination is only a supplement to other lab techniques (e.g., isolation, serology, etc.) in making a correct disease diagnoses. Top of the barrel diagnosis of poultry diseases is a thing of the past; yet, this is essentially the only procedure used in these diagnostic labs in Egypt. Isolation attempts are only, sometimes, done for Newcastle disease virus. We doubt the validity of the results of this procedure, since the embryos used for inoculation do not come from Newcastle disease free flocks.

There is an urgent need for a major change in this area if the industry is to make any further progress. Control of diseases goes hand in hand with the availability of a good diagnostic service.

GPC has its own "diagnostic facility" (see separate report on visit to Mataria). The activities of this lab fall far short of being acceptable as a diagnostic facility. This lab concentrates mainly on monitoring for NCDV and salmonellosis. An expansion of this facility and a change in its mission was being considered.

6. THE STATUS OF PULLORUM-TYPHOID DISEASES:

These diseases are widespread in the village flock sector. Very little data is available on the prevalence of these diseases in the private sector. In the public sector, our conversations with their personnel indicated these diseases are under control. The work force employed by both private and public sectors live in villages where these diseases are common; hence, it is always a possibility these diseases can break into private and public sector flocks.

There is no cohesive control program for these diseases in the village flocks. The MOA efforts are essentially amateurish, unsustained attempts. The two current proposals for Monoufia and Kafr El-Sheik governorates are examples of this type of thinking.

We looked into the facility that produces all the pullorum-typhoid antigens produced in Egypt. The antigens produced compared reasonably well with those manufactured in the United States that we took with us to Egypt. The method of standardization of the Egyptian antigen is very crude (see enclosed report). This is done on volume basis. The laboratory needs upgrading and again personnel training is badly needed.

7. POULTRY HEALTH PROGRAMS

At the onset of this project, not a single disease control program could be indentified. Through consultancis whereever such assistance was accepted, initiation of local health programs were instituded. The genesis of a GPC side program, and a National Poultry Health Program, were developed and provided

by the team. However, success of such programs is dependent upon the resolution of a variety of the recommendations outlined in Section II B of this report and in previously submitted Special Reports.

In summary, most of the problems relating to the Poultry Industry in Egypt, are correctable with appropriate inputs. Recognizing the limitations of resources available to be applied to the necessary solutions, the team believes it is imperative that a centralization of authority, data, and decision making regarding all items relevant to poultry production, be made. In fact, if success is to be achieved in poultry production, this centralization should include all meat options and essential elements. This would include red meats, dairy (or milk) production, fish, and essential "support" items such as necessary cereal grains & soya beans. Ultimately, this would also include allocation of acreage for various crops such as maize, soya bean, clover and other livestock forage.

As initially noted, the current consumption and availability of essential high quality protein foods primarily derived from animal products or fish, is significantly below internationally recognized standards for human nutrition, growth and health. According to best available data, the current consumtion and availability rate is approximately 4 kilo per year, as compared to the internationally accepted standard of 12 kilos per year. Also, the population in Egypt is increasing at a rate which would require increases in production well beyond the ability of the current resources and plans to achieve. The objectives of Egypt's Food Security program can be achieved only if all protein food alternatives and other essential relevant items, are utilized to the optimum through a well planned and centrally coordinated program. The principal result of this study, was the identification of those essential elements necessary for Egypt to develop and implement such a program.

ATTACHMENT II A-1 (page 1 of 3)

EXTRACT FROM USAID PROJECT PAPER

Description of the Project

The Poultry Improvement Project aims to develop programs which will assist Egypt to meet her long term goal of increasing poultry meat and egg production. Specifically the purpose of this project will have been accomplished when a program is designed which is targeted at Egypt's national goal in poultry production of increasing production of eggs and poultry meat to one and half billion eggs and 600 million broilers annually by 1987. Although the Poultry Improvement Project will not itself attempt to address this national target, it will provide inputs which will contribute to the development inputs which will contribute to the development of the national program when this project is completed.

There are six principal tasks to be completed in the Poultry Improvement Project.

1. A principal task is to develop the capacity to assess needs in the sector through analytical examination and technical studies and to provide decision makers with relevant information to allocate resources in the sector in order to accomplish targeted national goals. To accomplish this, the project will assist a unit of the Ministry of Agriculture to conduct an assessment of the poultry sector. The project will provide technical assistance in the form of a general project advisor, agricultural economic consultancies and training of individuals in this unit both on-the-job and in the U.S. This unit will identify the necessary studies and carry them out directly or contract for them. They will collate the information and develop the assessment by the end of the project. The principal input of the Government of Egypt will be the staff and the budget for the studies, while the USAID will provide the technical advisors and training.

2. A second equally important task will be the improvement of three breeder/ hatching farms. These farms are to provide day-old chicks and fertile eggs to the rural populace. The project will be directed to the improvement of three of 13 Ministry operated farms, others of which will be rehabilitated by the Government of Eygpt and other donors. In view of the large proportion of total production from village flocks (80% of poultry meat and 97% of eggs) it is considered essential to increase the capacity of these breeding/hatching farms in order to provide chicks of improved breeds to the small rural producers. It is anticipated that these farms will be an important input into any national program and hence their improvement is justified at this time prior to the establishment of such a plan. To accomplish this, the Government of Egypt will provide three fully staffed working stations and their operational staff budgets. They will also provide the cost of physical construction, including erection of facilities provided by the project, for the recommended improvement program. The USAID will supply equipment and commodities for this expansion.

3. A third major task will be recommendations to the Ministry of Agriculture for a national breed and hatchery improvement program responsive to the requirements of both commercial and rural aspects of a poultry development program in Egypt. This report will be an essential segment of the sector assessment but is listed separately because of the keystone nature of good poultry breeds and chick production capability in Egypt, and the need for outside assistance to accomplish the study and produce the report. USAID will provide a consultant team to undertake the study and will train a selected group of Egyptian poultry scientists in the U.S. in the latest relevant technology.

4. Another aspect of this project will take the form of policy recommendations to the Egyptian General Poultry Company and adoption by the Company of recommended practices aimed at more efficient management of Company operations. A production unit of the Ministry of Agriculture, the Poultry Company is the largest single producer of eggs and poultry meat in Egypt, as well as a supplier of chicks and feed to private producers. It is therefore an integral part of any national program. This

101

project will provide consultant services and training to the company. The report of the consultant will also be considered by the Ministry of Agriculture as part of the sector assessment.

5. A shortage of poultry vaccines presently exists in Egypt. In order to determine how to evercome this and other problems in the area of poultry pharmaceuticals, another vital task of this project will be to provide a national plan to the Ministry of Agriculture for increasing the availability of pharmaceuticals (including vaccines and feed additives) to the poultry sector. The USAID will provide a team to survey this field and assist the relevant office of the Ministry of Agriculture develop a plan with required supporting information. As with the Breeding and Hatchery Improvement Study and the Poultry Company Report, this study will be part of the overall sector assessment.

6. The final study component of the project will be to examine the village flock productive sector with the purpose of determining the role it plays in furnishing poultry meat and eggs to the economy and its degree of efficiency. If it is found to carry the significance indicated in the previous surveys and empirical observations, a plan will be developed for increasing services to these village producers for optimizing their production.

While the Poultry Sector Analysis will extend for the three-year life of the project, results and recommendations from the other project surveys will be complete during the first year. An extensive evaluation and review of findings generated as a result of the project's first year activities will be conducted in April, 1979. Further project activities indicated as a result of this evaluation and agreed upon by the Ministry of Agriculture and USAID will be added to this Poultry Improvement Project by appropriate amendment to the Project Paper and Grant Agreement.

The project will be implemented under the direction of the Minister of Agriculture and his designees. Technical assistance, commodity support and training program inputs will be provided under a contract between a U.S. institution and the Government of Egypt. A project Technical Manager will be provided by the Project Contractor to assist and coordinate all activities of the project in Egypt for the duration of the contract.

ATTACHMENT II A-2 (page 1 of 4)

EXTRACT FROM CONTRACT/WORK PLAN

ARTICLE II - SCOPE OF PROJECT AND SERVICES

The Contractor will provide the services in accordance with and as described in the Project Paper, and as further described in detail in APPENDIX A. This Article summarized the Tasks to be accomplished and which are described in Appendix A hereto.

This project will develop programs which will assist the Government of Egypt to meet her long-term goal of increasing poultry meat and egg production. It will provide inputs to, and the genesis of, the development of a National Poultry Program for Egypt.

To accomplish these end results, the Contractor will study and assess all segments of the Egytian poultry sector. This will be accomplished through the coordinated use of a team of U.S. poultry specialists, experienced management personnel and qualified technicians, as outlined in Section 5 of the General Provisions of this contract. These U.S. specialists will work in conjunction with various counterpart personnel in the government, most particularly those in the Ministry of Agriculture.

There are eleven (11) principal TASKS to be complete in this project. They are:

TASK 1 - VALUE ANALYSIS, CONTROLS, STUDY DESIGNS:

To be effectively implemented, each action within each task must be properly planned. the study elements properly designed, with personnel and material resources being will coordinated to assure their best possible utilization in achieving project objectives. The existing project work plan will be fine-tuned and updated. Key sub-elements are:

A. Permanent field staff will visit Egypt to assure agreement, compatibility, and acceptance between them and the Government prior to final assignment.
B. The Contractor's Technical Advisory Group of key team and task leaders will visit Cairo, meet with their counterparts, update all inputs, and resolve study design. Initial value and resource analysis will be conducted.
C. The basic design for an Econometric Model of the Poultry Sector of Egypt will be structured and its development initiated.

ATTACHMENT II A-2 (page 2 of 4)

EXTRACT FROM CONTRACT/WORK PLAN

ARTICLE II - SCOPE OF PROJECT AND SERVICES (cont'd)

D. Project control system will be resolved, designed and put into effect.

TASK 2 - DATA BASE AND SECTOR MODEL:

To achieve effective results, and to provide the opportunity for the making of effective decisions which can lead to such results, both the Contractor and the Government mangement require a sound data base. This task provides the necessary support by which such a base will be developed and maintained. Because of the broad nature of this project, the various complexities, impacts. and interrelations of activities within the many subsectors of the Egyptian Poultry Sector, this task also provides for the development, implementation, use and training of selected MOA personnel in the use of a simplified Econometric input-output model of the National Poultry Sector. This model may be manually manipulated, and will be adaptable to computer use.

TASK 3 - POULTRY SECTOR ANALYSIS:

This task will synthesize activity and input from all other tasks and provide the basis for final project recommendations which interrelate all poultry subsectors toward the potential development of a National Poultry Program. This will include the development of information relating to the current and projected market need as compared to current and projected sector capacities. These will include all relevant items such as feed, facilities, and productivity factors.

TASK 4 - GENETIC AND HATCHERY IMPROVEMENT PROGRAM:

A. Survey is made of existing genetic requirements, status of breed, and improvement program needs.
B. Survey other existing hatcheries. Identify status and needs.
C. Determine potential additional areas of need and scope of requirements to adequately support the National Poultry Program of both public and private sectors, particularly in regard to the Village flocks.
D. Provide consultancy to current operations with objective of operational improvement as feasible.
E. Develop recommendations for a national breed and hatchery improvement program. This will include baseline information.

110

ARTICLE II - SCOPE OF PROJECT AND SERVICES (cont'd)

TASK 5 - GENERAL POULTRY COMPANY CONSULTANCY:

This task will assess the current status of all GPC activities relevant to production, and identify primary constraints. This will include broiler and egg production units, processing plants and distribution/marketing system, feed mills, and any other relevant activities. It will develop recommendations for overcoming constraints, improving production and productivity, identify current and project the potential future role of GPC in the overall Egyptian Poultry Sector. It will provide consultancy to GPC management in operational and technical matters, and by means of a training program.

TASK 6 - ASSESSMENT OF OTHER GOVERNMENT AND PRIVATE SECTOR POULTRY PRODUCTION:

Since GPC and other departments of MOA are charged with the responsibility of providing certain support of a critical nature to all subsectors of the Poultry Sector of Egypt, it is necessary to identify the status, needs and impact of those sectors. This task will study all other such subsectors, and identify their relevance to the support they need from MOA, as well as their potential impact on existing resources and a National Poultry Plan.

TASK 7 - VILLAGE FLOCK ANALYSIS:

This task will identify the needs of the village flock sub-sector, its general current status as relates to the rural and urban markets, as well as the current Government support apparatus now used, and the potentiality of improvement if provided specific supports. Recommendations will be developed and include the Extension Service support role.

TASK 8 - PHARMACEUTICAL/BIOLOGICAL/VACCINE/ADDITIVES FEASIBILITY STUDY:

The purpose of this task is to identify the current capability of in-country and/or availability; constraints thereto; as compared to the needs. Recommendations will be developed for programs which would overcome the constraints, any shortfalls, and to provide necessary support and material to fill the needs of an expanded Poultry Program. This will include cost-benefit analysis of self-production vs. imports, and examination of the potential of foreign investment into manufacturing facilities in Egypt.

TASK 9 TRAINING/MANAGEMENT DEVELOPMENT PROGRAM:

This task will accomplish the training and management development of the 76 Egyptian personnel in required operational and/or technical areas of specialized activities. It includes all activities post-selection of participants through the actual training in U.S. industry and institutions, and follow-up assessment of results after return of the participants to Egypt.

TASK 10 - HATCHERY EXPANSION PROGRAM:

A. Specifications for improvement requirements and commodities will be completed for the state hatcheries at El Fayoum, Sakha, and Inshass.
B. Specific schedule and work assignments will be resolved - Contractor and Government. This will be published to assure proper coordination of all involved.
C. Government initiates site improvements.
D. GOE will issue Invitations for Bids for equipment and commodities in accordance with U.S.A.I.D. regulations. Arrangements made for purchase and installation by the Government.
E. Contractor will coordinate between vendor and the Government up and through expanded facility startup, if within the time frame of this contract.
F. Government completes site improvements on schedule; equipment/ commodities arrive and are installed..

TASK 11 - MANAGEMENT SUPPORT/REPORTS AND COMMUNICATIONS:

This task outlines and provides the management communications program to assure the best possible project results and utilization of all available resources. Activity will include monthly reports on project status, special reports on Task results, and final comprhensive report. This task also outlines how the two (2) project team members on station in Cairo will communicate and coordinate activities with MOA, AID and project team personnel. All reports will contain recommendations as applicable and as identified, specific activities relevant to the Egyptian Poultry Sector which may require more specific attention, and/or effort which is beyond the scope of this project.