~~124258~~
124258
124258

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

INFORMATION MANAGEMENT
& TECHNOLOGY DIVISION

MAY 25, 1984

B-214903

The Honorable John R. Block
The Secretary of Agriculture

Dear Mr. Secretary:

Subject: ASCS Needs Better Information To Adequately Assess Proposed County and State Office Automation (GAO/IMTEC-84-11)

We are writing to you to express our concerns with the county office automation proposed by the Agricultural Stabilization and Conservation Service (ASCS), and to recommend that ASCS proceed with a pilot project before committing itself to nationwide automation. We feel that such a pilot project is needed because (1) major segments of ASCS' cost-benefit analysis are seriously questionable and (2) the software technology proposed has not been tested by ASCS.

For several years, ASCS has been considering automation of about 2,800 state and county offices that administer its commodity and land use programs, which are designed for production adjustment, resource protection, and economic stabilization. ASCS officials believe computers will allow faster service and more accurate payments to farmers, reduce paperwork, give access to more management information, and improve county office productivity.

Automation would change the way ASCS field employees work. They now keep manual records on their business with farmers and send forms direct to the Kansas City Management Office (KCMO) for processing and entry in national data bases. State offices are not involved in the data flow. If the proposed automation is adopted, county offices will use computers to transact business and maintain local data bases, and will transmit data by telephone or mailed diskettes to state officials. State offices will consolidate and transmit the data to KCMO or to Washington, D.C.

ASCS tested the idea by installing computers in seven county offices. In April 1983, ASCS began a cost-benefit analysis to establish economic feasibility. The analysis, completed in September 1983, showed estimated benefits greater than estimated costs, but this may be overly optimistic. (The cost-benefit analysis is attached as encl. I.)

028987

(913711)

The estimates are uncertain because ASCS relied on judgment rather than historical data to project many costs and benefits and because available evidence does not support some of the projections. Two factors--the lack of historical data and the questionable use of claimed employee time savings--cause us to believe that the analysis alone does not provide an adequate basis for a hardware procurement estimated to cost between $67 million and $84 million.

Most of ACSC's estimated benefits (82 percent) were based on projections of staff time saved and accuracy improved. However, time saved, which accounts for over half the benefits, was based on county employees' judgmental estimates, and ASCS included no plans to reduce staff as a consequence of time saved. Further, the accuracy improvement was not substantiated by evidence, and other benefits were overstated. Estimated costs for equipment and maintenance, which were the largest cost categories identified, appear to have been understated. Finally, ASCS plans to use technology for the implementation phase that was not tested during the test phase, which increases the risk of unforeseen expenses.

Since we did our work, we have briefed staff of the House Appropriations Committee and conducted an exit conference with ASCS officials. ASCS has agreed to the Committee's request for a prototype program involving three states. We believe ASCS should proceed with this plan before committing itself to a nationwide procurement. Such a prototype would address the need we perceive for better information on which to base a procurement of this size.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our principal objective was to determine whether ASCS had adequately justified the automation of its state and county offices. We reviewed ASCS' cost benefit analysis and supporting documentation. We discussed the proposed automation with ASCS personnel in Kansas City; in Washington, D.C.; in the Kansas, Nebraska, and North Dakota state offices; and in the seven county offices testing automation. We visited three[1] of the seven test counties and talked by telephone with personnel in the other four counties. We have periodically apprised the staff of the House Committee on Appropriations as requested. Because ASCS has agreed to the prototype plan, we have not requested official agency comments on this report.

We made the examination in accordance with generally accepted government auditing standards, except that we used data from ASCS financial records without testing the records for accuracy and reliability. We do make such tests in periodic audits of financial statements.

---

[1]Crawford County, Kansas; Jackson County, Missouri; and Gage County, Nebraska.

AMOUNT OF STAFF TIME SAVED BY AUTOMATION AND ITS VALUE ARE BOTH UNCERTAIN

ASCS did not adequately predict the amount of employee time that would be saved by county office automation or the value of that time. Nor did they convince us that the employee time saved would be invested in other needed work. The savings expected to come from employees doing their jobs faster--about $25 million[2] annually--were based primarily on judgmental estimates made by ASCS employees in the seven counties that tested the automation. This dollar estimate is the salary equivalent of employee time that ASCS estimated might be saved by automation. In other words, ASCS figured high-workload counties, which handle about 86 percent of the workload, would do their jobs with 33-percent fewer staff days while most of the other counties would do theirs with 18-percent fewer.

The only actual time measured was that spent on address labels and envelopes--a small part of the workload. The rest of the estimate was based on employee opinion. The estimate included savings in functions such as field work and supervision which, it was admitted, would not be automated. County employees also said that ASCS is providing farmers with satisfactory service using the current manual methods.

Because ASCS does not plan to lay off permanent county office employees, the validity of a claimed dollar benefit from the time saved depends on ASCS' capability to use that time for other activities. According to the Director of the Automatic Data Processing (ADP) Policy and Planning Staff, the county employees will use the time saved to do other work, such as

- --collecting information on the economic condition of agriculture nationwide;
- --collecting information on grain storage facilities and grain transportation equipment;
- --providing computer models to assist producers in decision-making; and
- --collecting crop yield data for the Federal Crop Insurance Corporation (FCIC) to use in insuring crops against losses due to bad weather, insects, and other calamities.

ASCS believes this work would yield both tangible and intangible benefits. However, ASCS did not say how the additional work would contribute to more efficient accomplishment of program objectives. No one had determined the employee time required to collect the information or the dollar value of the better information to ASCS operations.

---

[2]Figure adjusted for present value.

ASCS employees made a judgmental estimate of the time county employees would use to collect FCIC crop yield data. However, FCIC had neither developed details on the crop data required nor reached agreement with ASCS on how much to pay for it. FCIC may already have the data, or it may obtain the data from sources other than ASCS, such as grower associations. At the time of our review, sufficient details on individual crop yield data requirements were not available to enable us to assess the validity of ASCS' time estimate for this task.

ESTIMATED SAVINGS FROM ACCURACY IMPROVEMENT ARE NOT SUBSTANTIATED

The second largest benefit claimed by ASCS--$17.3 million saved annually after complete automation--was to come from improved accuracy. ASCS based its projections on errors identified in 103 inspector general audit reports. ASCS assumed that automation would generate savings by eliminating such human errors as incorrect calculations and failure to correctly offset program payments against delinquent loans.

We found that ASCS' projections were questionable because they were based on

--savings projected on the basis of questionable assumptions;

--savings projected from incorrect data; and

--savings from the prevention of errors which we believe automation would neither prevent nor detect.

ASCS' questionable assumptions included (a) overly optimistic estimate of savings from county office employee time saved; (b) overly optimistic calculation of KCMO staff reduction and savings from it; and (c) overly optimistic calculation of savings from reduced use of part-time employees. These are explained below.

The county employee time savings was discussed in detail earlier. We believe that it is unreasonably optimistic to claim that all the time saved would be used for other purposes and thus effect a salary savings. ASCS estimated that county offices' doing much of the data processing now done at KCMO would allow reducing KCMO staff. ASCS based the projected KCMO staff reduction on April 1983 employment levels, which were higher than average. KCMO projected the staff requirements for the divisions that would be affected by county office automation, and then subtracted this number from the number of employees it had in April 1983 to show a "staff reduction" and thus a savings.

Incorrect data were used to project salary savings of about $3.2 million annually from this personnel reduction, causing it to be overstated. KCMO sometimes hired temporary employees because of changes in farm program activity, and a number of its permanent part-time employees worked less than a 40-hour week. Although most of the staff reductions--181 of 216 positions--were either

temporary or part-time, ASCS assumed that each one eliminated would save a full year.

For temporary or part-time positions, actual staff years, rather than the number of employees at any given time, would be a more realistic basis for projecting personnel savings. The average of actual staff years for fiscal years 1981 and 1982 was 296, even though 394 different persons were employed in April 1983. We used the average staff year level of 296, the 1983 average salary level, and ASCS' projected staff requirement after automation to arrive at our estimate of $2.1 million in annual savings at KCMO from staff reduction instead of the $3.2 million that ASCS estimated.

ASCS also used incorrect data to project that automation would save $3.7 million annually from improved accuracy in the Farm Storage Facility Loan Program. In reviewing the nine inspector general audit reports that formed the basis for this projection, we analyzed ASCS' methodology in making the nationwide projection. The savings were projected on the basis of total new loans, instead of on those loans that were written off as uncollectible. In fiscal year 1982, ASCS made new Farm Storage Facility loans of $96.2 million, but only $591,000 of that amount was considered uncollectible. The savings expected from automation were projected as a fraction of total loans instead of as a fraction of the now uncollectible loans. Thus, while presently uncollected loans were actually $591,000, ASCS predicted that automation would save $3.7 million. Moreover, ASCS recorded a $1,386 delinquent payment loan as a savings in its calculation even though the portion of the payment that the county office did not offset was only $322.

Both incorrect data and errors that we believe automation would not correct are seen in ASCS' projection of an annual savings of $4.5 million in the deficiency program. In making this projection, ASCS offset underpayments of $3,260 in two counties against total overpayments of $15,523 in nine counties. Our tests covered three counties and a total of $10,121, or 65 percent, of the deficiency overpayments that ASCS used for its projections. The test results follow.

--In Yolo County, California, ASCS used a $1,691 underpayment as an overpayment in its projection.

--In Piatt County, Illinois, where ASCS claimed overpayments of $2,861, the county office had not required grain producers to certify that the wheat they planted was to be harvested as grain. Such certification is required to establish eligibility for deficiency payments. The inspector general did not consider the $2,861 as overpayments or recommend collection and it does not seem to us that automation would produce the savings that ASCS claimed in this county.

--In Hardeman County, Texas, inspector general personnel found--by field visits and aerial photo measurements--that two producers had incorrectly reported the amount of their

irrigated acreage. ASCS regulations state that whenever measured acreage differs from reported acreage, program benefits are lost unless a "good faith" determination can be made.[3] If such a determination is made, benefits are only reduced. The Texas State Committee considered one case, determined good faith, and assessed the producer a payment reduction of $373. No corrective action was reported on the other case. ASCS claimed automation would have detected the incorrect acreage and saved the total payment of $5,196 to one producer plus the $373 assessed against the other producer. We question how a computer in the county office could have detected an error that was actually found by making field visits and measuring aerial photographs.

--ASCS based its projection of recurring annual nationwide savings on deficiency payments made in fiscal year 1981, even though such payments are not made every year. For example, no payments were made in fiscal year 1982.

County office automation may improve the accuracy of computations. However, ASCS' assumptions and methodology in determining the potential savings from automation did not adequately support its claimed annual savings of $17.3 million. What the savings may be, if any, are unknown.

OTHER SAVINGS WERE ALSO OVERSTATED

Other projected benefits of about $16.3 million annually included savings by (1) replacing addressing equipment, (2) reducing postage expenses, (3) eliminating preprinted forms, (4) eliminating contract costs for data entry into the central computer system, (5) reducing usage of the central computer, and (6) reducing the staff at KCMO. Some of these savings were also overstated.

ASCS' projected annual savings in postage costs of nearly $2.15 million included $750,000 from giving county offices the capability to presort mailings to farmers by zip code. However, according to the Director of the ADP Policy and Planning Staff, addressing equipment they already had would provide this same capability. Since this part of the savings could be achieved with either the addressing equipment or office automation, we believe it should not be claimed as a savings due to automation.

COSTS MAY BE HIGHER THAN ESTIMATED

Other cost categories, including hardware and hardware maintenance, may be higher than ASCS estimated. ASCS projected the cost of automating state and county offices on the basis of information gathered in the test counties, on analyses of equipment requirements and assumed data transmission, and on judgment. Since costs

---

[3]Cases of this kind are decided by committees: each county has a committee which can refer cases to a state committee if need be.

were based partly on judgment and included a rather limited number of test counties, actual costs may differ greatly from the projections. For example, ASCS used a consultant to estimate ADP equipment costs for its analysis. However, after ASCS completed the cost benefit study, the consultant figured that the equipment should cost from $3 million to $17 million higher than the figure ($67 million) that ASCS had used because ASCS changed its equipment requirement and some prices changed. We believe that these variances cast further doubt on ASCS' cost benefit analysis.

The maintenance cost of equipment may also differ from ASCS' assumption that it would be 9 percent of the equipment purchase price annually. For the equipment used in the seven test counties, maintenance costs averaged 11 percent of purchase price, not 9. ASCS assumed that maintenance costs would be lower than the test indicated because it proposed a cooperative maintenance agreement whereby county office employees would perform much of the maintenance. The consultant prepared a technical assessment paper which stated that, although vendors were working to make systems easier to support, no one vendor combined the best of diagnostic and support software with the most easily maintained hardware. This would make achievement of the ideal state and county office automation environment an elusive goal. A more conservative approach may be to estimate a range for maintenance costs of 9 to 11 percent.

Actual costs may differ from ASCS projections in other areas, such as data communications. This is an example of a projection for which there is no historical information available. ASCS did not consolidate data and send it through the state offices in the automation tests. Instead, it estimated the volume of data and the time required to send it. However, since ASCS has no experience with the procedure, it may find that data transmission takes more or less time than this judgmental estimate indicated. Actual costs may be higher or lower than ASCS estimated.

INCOMPLETE TESTING INCREASES RISKS

ASCS had not tested some of its key objectives. The testing phases did not include using a fourth generation[4] language processor to develop new applications and made only limited use of interactive terminals to serve producers. However, ADP Policy and Planning Staff officials said programmers will need a fourth generation language processor as they develop new applications because of the dynamic nature of agricultural programs, and they plan to use one for implementation. In some cases, program changes must be implemented in a few days and new programs supported in several weeks. They believe it would take too long to prepare new computer applications in a traditional computer language like COBOL; a better language is needed. However, ASCS did not test a new language.

---

[4]This term refers to a number of new software products that offer faster development of computer applications than older methods, such as programming in COBOL.

According to ASCS' consultant, applications developed with a fourth generation language processor usually require more system resources and give slower response time to users than those developed with traditional languages. We believe that ASCS' plan to implement with a technology that has not yet been tested increases the risk of unforeseen need to increase machine sizes, and unforeseen training and maintenance costs.

EVENTS SUBSEQUENT TO OUR FIELD WORK INDICATE THAT PROTOTYPING WILL BE DONE

After we completed our review, an approach was proposed which we believe could provide better information for the nationwide automation. At an October 18, 1983, briefing of the staff of the Subcommittee on Agriculture, House Appropriations Committee, a member asked us if implementing a small number of states first as prototypes could satisfy the need for better estimates and more thorough testing. We said we thought it could.

We held our formal closeout conference with ASCS officials on December 15, 1983. At that time, the officials said they had already agreed with the Committee to implement prototypes in three states and defer the others until the end of the prototype period. We believe this is an appropriate way to gather better information for future nationwide automation.

CONCLUSIONS

Because of the substantial uncertainty in the estimates, ASCS' cost-benefit analysis was not credible. While we realize that predictions are difficult to substantiate, we feel that better information is needed before ASCS commits the full amount of the proposed procurement. The fact that ASCS has not tested the software that is intended for implementation further increases the risk of proceeding.

RECOMMENDATION

We recommend that you direct the Agricultural Stabilization and Conservation Service to proceed with the prototype project in three states and defer the planned nationwide automation of state and county offices until the prototype has provided credible cost-benefit information and tested the technology.

- - - - -

As you know, 31 U.S.C. 720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations no later than 60 days after the date of the report. A written statement must also be submitted to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60

days after the date of the report. We are sending a copy of this report to the Chairman of the House Committee on Appropriations.

Sincerely yours,

Warren G. Reed
Director

Enclosure

ENCLOSURE I

COST BENEFIT ANALYSIS OF AUTOMATING THE OFFICES OF THE AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE

The following schedule shows ASCS' estimates of the costs and benefits of automating county offices. The costs and benefits are assumed over an 8-year system life to begin with fiscal year 1985. Costs and benefits are prorated according to ASCS' installation plans, which will be implemented over a 3-year period. Fiscal year 1984 costs are preparatory activities directly attributable to automation.

ENCLOSURE I

COST BENEFIT ANALYSIS
OF
AUTOMATING THE OFFICES OF THE
AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE
(000's omitted)

ITEM	FISCAL YEAR								
	84	85	86	87	88	89	90	91	92
Nonrecurring costs									
Site preparation	$1,352	$1,954	$1,487	$ -	-	-	-	-	-
Installation time	-	128	282	214	-	-	-	-	-
Coordinator training									
Travel/per diem	37	38	-	-	-	-	-	-	-
Supplies/equipment	120	-	-	-	-	-	-	-	-
Contractor assistance	50	-	-	-	-	-	-	-	-
State/county training									
Employee time	-	809	1,145	872	-	-	-	-	-
Travel/per diem	-	206	498	378					
Establishing tract records	4,670	11,306	8,603	-	-	-	-	-	-
Data loading	-	1,934	4,683	3,563	-	-	-	-	-
Procurement assistance	645								
Equipment	-	12,730	30,820	23,450	-	-	-	-	-
Requirements specification									
Employee time	277	136	-	-	-	-	-	-	-
Travel/per diem	75	38	-	-	-	-	-	-	-
Total	$7,226	$29,279	$47,518	$28,477	-	-	-	-	-
Recurring costs									
Maintenance	$ -	$ 1,146	$ 3,920	$ 6,030	$6,030	$6,030	$6,030	$6,030	$6,030
Data communications	-	391	1,226	1,861	1,861	1,861	1,861	1,861	1,861
Training center	20	20	20	20	20	20	20	20	20
Personnel									
Automation coordinators	1,400	1,867	1,867	1,867	1,867	1,867	1,867	1,867	1,867
KCMO - additional	373	1,058	1,244	1,058	840	622	622	622	622
Coordinator travel	-	80	274	422	422	211	211	211	211
Supplies and utilities	-	372	1,179	1,794	1,794	1,794	1,794	1,794	1,794
Total	$1,793	$ 4,934	$ 9,730	$13,052	$12,834	$12,405	$12,405	$12,405	$12,405
Total cost	$9,019	$34,213	$57,248	$41,529	$12,834	$12,405	$12,405	$12,405	$12,405
Discount factor	.909	.826	.751	.683	.621	.564	.513	.467	.424
Present value cost	$8,198	$28,260	$42,993	$28,364	$ 7,970	$ 6,996	$ 6,364	$ 5,793	$ 5,260

ENCLOSURE I

ITEM	FISCAL YEAR 84	85	86	87	88	89	90	91	92
Nonrecurring benefits									
Equipment cost-avoidance	$2,160	$ 2,160	$ 2,160	$ 2,160	$ 2,160	$ -	$ -	$ -	$ -
Recurring benefits									
Maintenance on foregone equipment	216	432	648	864	1,080	1,080	1,080	1,080	1,080
Temporary employee reduction	-	-	1,165	3,985	6,130	6,130	6,130	6,130	6,130
Postage reduction	-	-	408	1,397	2,149	2,149	2,149	2,149	2,149
Forms reduction	-	-	247	845	1,300	1,300	1,300	1,300	1,300
KCMO staff reduction	-	-	-	-	3,161	3,161	3,161	3,161	3,161
Contract reduction									
Optical scanning	-	-	29	50	50	50	50	50	50
Key entry	-	-	18	60	93	93	93	93	93
Kansas City Computer Center reduced usage	-	-	-	-	2,314	2,314	2,314	2,314	2,314
County staff time	-	-	12,059	41,254	63,468	63,468	63,468	63,468	63,468
Accuracy improvement	-	-	1,536	7,155	16,777	17,342	17,342	17,342	17,342
Total benefits	$2,376	$ 2,592	$18,270	$ 57,770	$ 98,682	$ 97,087	$ 97,087	$97,087	$97,087
Discount factor	.909	.826	.751	.683	.621	.564	.513	.467	.424
Present value benefit	$2,160	$ 2,141	$13,721	$ 39,457	$ 61,282	$ 54,757	$ 49,806	$45,340	$41,165
Present value summary									
Cumulative annual costs	$8,198	$36,458	$79,451	$107,815	$115,785	$122,781	$129,145	$134,938	$140,198
Cumulative annual benefits	$2,160	$ 4,301	$18,022	$ 57,479	$118,761	$173,518	$223,324	$268,664	$309,829
Benefits/cost ratio	0.26	0.12	0.23	0.53	1.03	1.41	1.73	1.99	2.21

ENCLOSURE I