

Establishing and Monitoring Statistical Standards in USDA-NASS

William L. Arends

National Agricultural Statistics Service, U.S. Department of Agriculture, Room 5041A,
1400 Independence Ave. S.W., Washington D.C. 20250

Abstract

The United States Department of Agriculture's National Agricultural Statistics Service (NASS) surveys farmers and ranchers across the United States and Puerto Rico for the purpose of making estimates on crops, livestock, production practices, and farm economics. NASS has established statistical standards documented in a series called Policy and Standards Memorandums (PSM). The PSM series is used to establish basic Agency administration policies and procedures, delegate or amend organizational authorities, and establish Agency operational program policies and standards relating to agricultural statistics, surveys and the census, statistical research, and reimbursable surveys. PSMs are approved for 5 years but are updated as required. NASS also conducts periodic Technical Reviews both of its Field Offices and Programs. This is a procedure to monitor the implementation of the standards and determine additional standards that are needed.

Key Words: standards, policies, guidelines, quality, audits

1. Introduction

The United States Department of Agriculture's National Agricultural Statistics Service (NASS) surveys farmers, ranchers, and agri-businesses across the United States and Puerto Rico for the purpose of making estimates on crops, livestock, production practices, and farm economics. The Agency has its headquarters in Washington D.C. and serves all 50 states and Puerto Rico through 46 NASS Field Offices. To support the administration of a statistically sound program, NASS identified, categorized and documented its statistical standards in a series called Policy and Standards Memorandums (PSM). The PSM series is used to establish basic NASS administration policies and procedures, to delegate or amend organizational authorities, and to establish NASS operational program policies and standards relating to agricultural statistics, surveys and the census, statistical research, and reimbursable surveys. To oversee and monitor the Statistical Standards Program, NASS has a Statistical Standards Officer. Under the officer's guidance and oversight, NASS conducts periodic Technical Reviews of its Field Offices and programs. These reviews serve as a mechanism to monitor the implementation of NASS standards and to determine if additional or updated standards are needed.

The NASS Statistical Standards Program, initiated in the 1980s, has been highly successful in serving the needs of a statistical organization. This paper addresses the steps NASS followed in building this program -- identifying standards for all processes and

procedures in the survey process, establishing a staff with oversight responsibility, establishing an organized process for documenting standards, and for establishing a monitoring process to evaluate NASS compliance with these standards. Reasons for non compliance need to be addressed as it may signal unawareness of the standard, a need for training, or possibly the need to update a standard.

As a federal agency, NASS statistical policy and standards must be consistent with the standards and guidelines set forth by the Office of Management and Budget (OMB). In September 2006, OMB issued *Standards and Guidelines for Statistical Surveys* (http://www.whitehouse.gov/omb/inforeg/statpolicy/standards_stat_surveys.pdf) for all federal agencies. These standards updated those established in OMB Statistical Policy Directives Nos. 1 and 2, on Standards for Statistical Surveys, and Publication of Statistics, respectively. These standards and guidelines were last revised in 1974 and reissued in 1978.

2. Establishing a Foundation for Statistical Standards in NASS

The first PSM on *Policy for Documentation of Statistical Standards* states: “The primary objective of a standard is to ensure consistent, correct application of procedures for frequently occurring activities. This applies to consistency among operational units and consistency among surveys. Therefore, a standard should be established for any statistical activity that occurs frequently under similar conditions -- either across time, across surveys, or across organizational units. The standard should describe procedures to be followed in "normal," current situations. If a situation is considered extreme but has happened and may happen again, it should be documented and covered by the standard.” This objective resulted from four major NASS Initiatives of the 1980s which provided the groundwork for the NASS Statistical Standards Program. For a statistical agency to be viable, survey processes and procedures must be standardized -- well defined, repeatable, and statistically defensible -- so that data are handled consistently. All survey processes must be included in the standards program.

In March 1983, Framework for the Future was written by a NASS Long Range Planning committee. The initiative included a chapter devoted to statistical standards. It stated: “The first building block for all future activities of the [Agency] must be statistical standards. The Agency should develop and operate its statistical program under a defined set of standards. Once these standards are defined, the policy should be to organize all survey, estimation, and publication efforts to most efficiently meet the standards. Statistical standards will provide a benchmark against which all statistical procedures, current and future, should be measured and evaluated.” For each NASS survey that resulted in an official published estimate by the NASS Agricultural Statistics (Crop Reporting) Board, the initiative identified nine objectives that should be followed. The nine objectives under which each survey should operate were: sample design standards; sample frame maintenance standards; data collection standards; data editing standards; survey summary standards; analysis standards; quality control standards; Crop Reporting Board standards; and documentation and publication standards. In addition, to improve the quality of NASS’s statistical information and increase the consistency and the general understanding and awareness of the Agency’s standards, the initiative further

recommended developing a technical review program to systematically review field office and headquarters procedures.

In May 1985, the Administrator appointed a task group including members from inside and outside the Agency to review and make recommendations regarding the Agency's structure and identification. The task group's report, Structure for Service, recommended establishing a Standards and Audit Staff. This staff was to assist in establishing standards across all statistical survey functions and in providing mechanisms for monitoring Agency activities relative to these standards. The report made a very important point: "The development of, and adherence to, statistical standards will involve all units of the Agency."

In June 1985, the USDA Economic and Statistics Review Panel (an outside review panel formed by Secretary John Block) included a section on quality control. To insure data quality in the NASS survey process, it recommended that common statistical standards be used for processes and procedures in all field offices; standardization for data collection and editing should be strengthened; and field office technical reviews should be expanded to visit each office twice a decade.

In July 1985, the final initiative was a report from a primarily internal task group. Crop Reporting Board Standards, presented specific recommendations and priorities for standardizing the estimation and publication process. These recommendations involved the Crop Reporting Board identity and membership and establishing standards for: the Crop Reporting Board's use of data and indications; analysis; estimation; historical data base; published data; and the operating procedures for the Crop Reporting Board.

3. Building on the Foundation

In 1986, NASS established a Statistical Standards Staff, headed by the Standards Officer, in compliance with the Structure for Service initiative. This staff worked with all units of NASS to integrate the principles of standardization and quality control in everyday tasks. They followed the premise that "Standards only have relevance and meaning when they are required and expected of the staff as part of any task."

In April 1987, the Statistical Standards Staff sought input from all Agency units to set priorities for developing standards and to identify areas not previously covered, considered or documented. A State of Standards Survey was conducted that identified over 100 subject-areas distributed under 13 general topics for which standards had been or should be established. The 13 general topics included survey design; sample design; sampling frame construction and maintenance; questionnaire design; training; data collection; data validation/editing; data analysis; survey summary; data administration; estimation; publication; and miscellaneous (confidentiality, documentation, research, use of historical data, etc.). Of the 100 plus subject-areas, the employees interviewed felt that 50 percent had documented standards; 15 percent had "unwritten" standards; and 35 percent had no standards in any form. Of the existing standards, it was estimated that about 50 percent were documented in Agency manuals, 10 percent in Agency or Departmental official memorandums, and the other 40 percent in other NASS documentation including staff reports, planning committee minutes, worksheets,

publications, etc. Evident from the survey findings was the need to maintain organized documented standards.

In 1988, the Policy and Standards Memorandum (PSM) series was initiated to establish an organized, up to date, complete set of documented NASS statistical standards. The PSM series is used to: (1) establish basic Agency administration policies and procedures; (2) delegate or amend organizational authorities; and (3) establish Agency operational program policies and standards relating to all aspects of data collection and summarization for agricultural statistics, statistical research, and reimbursable surveys. PSMs encompass all policies and functions required to generate agricultural statistics and conduct the census of agriculture, including statistical research and reimbursable surveys. The PSM series is separated into five (5) categories: (1) Administrative Memorandums which establish Agency administration policies and procedures. (2) Human Resources Memorandums which establish basic Agency policies and procedures on such things as recruiting, recognition and awards, performance reviews, and career development. (3) Confidentiality and Security Memorandums which establish Agency policies and procedures concerning maintaining confidentiality as well as security of data and systems. (4) Agricultural Statistics Methodology and Standards Memorandums which establish policy and standards for the NASS Surveys and Censuses and Estimating Program. They encompass standards for the development of concepts, methods, and design; collection of data; processing and editing of data; production of estimates and projections; data analysis; review procedures; and dissemination of information products. They also address the statistical and survey research program, and statistical service to customers such as for reimbursable surveys or consultation; and (5) Information Technology Memorandums which establish standards for operational procedures and computer security policies.

4. Administering the Use of NASS Statistical Standards

The first PSM on *Policy for Documentation of Statistical Standards* establishes the governing authority and administrative rules associated with PSMs. NASS policies provide guidance on how NASS does business and how NASS functions in an ever-changing environment. The procedures and programs employed by every NASS operational unit must be consistent with the policies set forth in the PSMs. All policy PSMs provide a sufficient explanation of why a specific policy is needed, firmly state the policy, and designate who is responsible for adherence to the policy.

PSMs are effective upon the date of issuance for five years, but they can be revised and updated as required in the interim. Those which require specific action to be taken by a specified date will only be in effect until that time. PSMs will be either updated and reissued or retired; those which pass their expiration date while in the process of revision or clearance will continue in force until reissued. Each memorandum subject is assigned a permanent sequence number which does not change when the PSM is updated and reissued. The sequence number remains the same for that subject as long as the series is active.

PSMs are prepared by the organizational functional unit responsible for the policies and standards being addressed. All statistical standards and policies will undergo a review process before being adopted by the Agency. Drafts of proposed standards will be submitted to the Standards Officer for coordination of a review process designed to allow diverse viewpoints to be considered. The review process consists of three phases: (1) technical peer review, (2) a review and approval by the Business Council (consisting of all senior branch chiefs), and (3) policy review by the Senior Executives and Associate Administrator. The technical peer review will consist of two or more independent reviews by knowledgeable Agency reviewers. An additional review performed by someone outside the Agency may be conducted when the standard covers material considered appropriate for an external analysis. These reviews could be solicited from members of other government statistical agencies (Census, Bureau of Labor Statistics, etc.), members of the Washington Statistical Society, or statistical departments at universities. The Associate Administrator has final approval of all Policy and Standards Memorandums. It is the Standards Officer's responsibility to help identify areas needing additional or revised standards and policies and to provide technical assistance in developing and documenting the PSMs.

Copies of supporting and historical material for PSMs must be maintained by the establishing functional unit. Statistical standards documentation includes supporting and historical material, such as: subject; description of the standard; adherence; previous proposals; duration/expiration; associated NASS organizational groups; and reference materials. This supporting and historical information will be kept by the NASS functional unit who is responsible for updating the PSM.

5. Additional Official Memorandums used to Communicate Policies, Guidelines, and Procedures

In addition to PSMs, NASS uses other series of official memorandums to document and communicate detailed guidelines, procedures, and instructions as well as changes to policies. These series are Operations Memorandums, Decision Memorandums, and instruction manuals.

The Operations Memorandum (OM) series is used to provide Agency instructions for implementing program work, training activities, administrative activities, estimating and survey program activities, census activities, and information technology activities. All OMs are reviewed and approved by all appropriate Agency units before issuance. They are divided into the six functional areas: Training, Teams, Administrative, Estimating and Survey Program, Census, and Information Technology.

Decision Memorandums are used to make changes to current NASS policies and programs or implement new policies and programs. Decision Memorandums are addressed and approved by the Senior Executive Team (SET) at their regularly scheduled meetings. Decision Memorandums of an emergency nature that cannot be addressed at the regularly scheduled SET meetings may be addressed and approved by the Administrator.

Instruction manuals which provide census, survey, estimation, or program operation instructions are detailed extensions of existing Agency policies and procedures established by PSMs and OMs. Examples of these detailed instructions are the following manuals: Estimation Manual, Census Administration, Survey Administration, Survey Management System, Electronic Data Reporting, Survey Interviewers, Computer Assisted Survey Information Collection and Editing, List Sampling Frame, Reimbursable Surveys Handbook, Data Processing Systems, Local Area Network Manual, Administrative Handbook, and NASS Correspondence Manual. The manuals are prepared and maintained by the responsible Agency units and they are approved in accordance with procedures established by Senior Management. Manuals serve as the basis for training at all workshops conducted for and by the field offices, or take the place of workshops restricted by available resources.

6. Monitoring the Use and Awareness of NASS Standards -- Technical Reviews

Policy and Standards Memorandum 18, *Standards for Technical Reviews*, assigns responsibilities and establishes procedures for technical reviews of NASS field offices and programs. The purpose of Technical Reviews is to improve the quality of NASS's statistical information and increase the consistency and the general understanding and awareness of the Agency's standards. Technical Reviews are important in monitoring adherence to NASS standards and a key to assessing their effectiveness.

The Technical Review program was initiated in 1983 as a way to systematically review field office and headquarters procedures and programs. A program may be defined as a commodity program (e.g., cattle or stocks) or as a functional activity (e.g., list frame or data dissemination). Procedures and guidelines are included in PSM 18 for: (1) selecting programs to be reviewed; (2) appointing team sponsors, leaders, and members; (3) writing a team charter; (4) reporting findings and recommendations; and (5) following up on the team's recommendations.

Technical Reviews serve as a quality audit and assurance mechanism. The goal of the program is to improve the future by adopting better procedures than those currently in use. Each Technical Review Team (TRT) examines methods and procedures used to carry out the Agency's statistical programs. Each team (1) assesses how well each program meets established standards, (2) examines the complete program including definitions, sampling frames, list maintenance, methodology, processing of the program, data quality, review, and publication, and (3) recommends actions to correct any detected problems and improve the program. Reviews include operations in Field Offices (FOs) and headquarters. Technical reviews do not address personnel issues.

7. Objectives of Technical Reviews

Each TRT examines the procedures used to carry out the Agency's statistical programs. The Technical Review Team evaluates how well each program meets established standards and determines how well each program is conducted in the absence of

sufficient standards and procedures. Technical reviews identify best practices and statistically sound techniques and procedures that can be adopted or incorporated as standards for use by other Field Offices and headquarters units. This last objective is particularly important.

The TRT uses standard guides to evaluate the effectiveness of current office procedures as it relates to: Are we doing the right things?; Are we doing them correctly?; Are the right people doing them?; Are we following the procedures the most efficient way?

Technical review reports document the positive as well as areas that need improvement. When problems are uncovered, solutions are offered. One goal of technical reviews is to be a learning experience for all units being reviewed and the team members.

8. History of Technical Reviews

In "Framework for the Future" (March 1983), the Long-Range Planning Group recommended the initiation of a technical review procedure within the Agency. The Technical Review program was subsequently initiated in 1983. The original program centered on systematic review of FOs. These reviews focused on how well the unit functioned and followed general Agency instructions. On-site interviewing was the primary method of fact-finding. These interviews uncovered gaps in responsibility and documentation, and potential breakdowns in "checks and balances." From 1983-1985, seven FOs were reviewed for office management and general procedures; List Sampling Frame maintenance and use; data collection; data edit, review, and analysis; and data processing. Headquarters units responsible for the June Enumerative Survey program were also the subject of a technical review. Funding, staffing limitations, and the Agency's restructuring prevented any technical review activity in 1986. The program objectives and procedures were then re-evaluated and modified.

From 1987-1992, all NASS Field Offices, except Alaska and Delaware, were reviewed using the refined guidelines and procedures. This approach was to evaluate Agency processes and programs by reviewing specific units, primarily FOs. Office management and personnel reviews were eliminated. Rather than focusing on how well the unit functions, technical reviews were changed to concentrate on technical procedures for specific topics. The primary focus is a "hands-on" review of procedures but the need for on-site interviews still exists. This hands-on review includes reviewing the questionnaires, instruction materials, edit and summary materials, worksheets, publications, and internal documentation. The new objectives focused on List Sampling Frame, Agricultural Surveys, grain prices, questionnaire design, county estimates, and two or more estimates programs or surveys. Local Area Network Use and Computer Security were added to technical reviews in 1992. The headquarters review conducted in 1993 included the Grain Stocks, Grain Prices, and Milk programs.

The next cycle of reviews was conducted in 1993-1995 in 22 FOs. The format for FO technical reviews remained virtually the same as that from the previous cycle in 1987-1992. Program areas broadened to include survey management practices and procedures rather than examining a specific survey program, such as Agricultural Surveys. Reimbursable surveys sponsored by state departments of agriculture or universities,

Weather-Crop procedures, and county estimates programs became part of the technical reviews. The Grain Prices survey program, List Sampling Frame, and Local Area Network Use and Computer Security remained from the previous cycle. After 1995, the review program was suspended during the 1997 and 2002 Census of Agriculture periods due to resource conflicts and budget constraints.

Technical Reviews were reinstated in 2005. A similar format was used as during 1993-1995. A schedule was developed to review all Field Offices in a five year cycle, 2005-2009. Additionally, at least one review of a program was to be completed in headquarters each year. From 2005-2006, 20 FOs were reviewed. In headquarters, the cattle program was reviewed in 2006 and a follow-up review conducted for cattle on feed in Iowa (the regional data collection and estimation center). Following 2006, however, the review program was suspended again due to resource conflicts and budget constraints with the upcoming 2007 Census of Agriculture.

A final short revival occurred in 2009, briefly resuming the five year cycle started on 2005. Reviews were completed in five more FOs and initial plans were being made for another program review in headquarters. Additional focus was placed on specialty commodities and regional operations in FOs in addition to the previously mentioned core topics. However, it was necessary to stop reviews again to devote the needed resources to Long Range Planning and five Operational Efficiency Initiatives identified by the Administrator and senior management.

9. Operations of Technical Reviews

The Program Planning Council (PPC), comprised of senior management and four FO directors, has responsibility for administering the TRT program. The PPC determines which programs are to be reviewed from those nominated by the members. The number of reviews in any fiscal year depends on available budget and resources. The PPC is responsible for developing the team charter which identifies the basic team responsibilities and objectives. The PPC will name a Sponsor and work with the Sponsor to select a Team Leader. The Team Leader should be objective and have demonstrated technical expertise in the subject to be reviewed but should not have a current vested interest in the program. Under the direction of the Sponsor, the Team Leader will determine up to five prospective members, with at least one Field Office representative, each possessing expertise in the subject area they will review. The Standards Officer will be available to assist with the organization of the team and function as a technical advisor. The Standards Officer may be selected as a team member, but membership is not mandatory.

Each team prepares a final report of its findings and recommendations. This report is presented to the Executive sponsor and posted on NASS's intranet available to the entire agency. The TRT also presents its findings and recommendations to the office being reviewed at a closeout meeting at the end of the review. All recommendations must be acted upon by the responsible unit. The Standards Officer maintains historical records of TRTs including charters, team members, reports, and follow-up schedules and results.

9.1 Headquarters Technical Reviews

Each headquarters TRT will be chartered by the PPC. A general set of objectives will be included in all charters for reviewing commodity programs. These include evaluating documentation, program coverage, frame coverage, questionnaire content and design, data acquisition, processing, estimators, commodity review and submission, and publication. Special objectives may be added to support the Strategic Plan and to ensure particular concerns are addressed. For reviews of functional activities, objectives are dependent on the program being reviewed and will be written on a case-by-case basis.

9.2 Field Office Technical Reviews

The Agency's budget determines the number of field office reviews conducted each year with the goal to review all field offices within five years. Field Operations, through consultation with other Agency management, will determine the number and specific field offices reviewed each fiscal year. Technical reviews will occur primarily January to May and July to November to avoid peak survey periods to minimize the burden placed on the FO.

The Standards Officer coordinates input from the Associate Administrator and Division Directors to determine the programs and activities reviewed. Field Office Technical Reviews will normally consist of reviews of sampling frames, surveys and survey management practices, Agricultural Resource Management Survey, reimbursable surveys, prices received, selected estimation programs, security (physical and computer), and Local Area Network administration. As part of survey management practices in all reviews, the team evaluates the management and training of the enumerator corps to clearly understand and follow survey procedures. Additional programs may be identified for each FO technical review. The team also considers actions taken by the field offices reviewed and their response to recommendations from previous technical reviews.

10. Contributions from Technical Reviews

Significant contributions have come from the technical review program. The need for new systems was identified for county estimates, grain prices, weather crop, and estimates submission. Improved processes were recommended for major surveys, questionnaire development, and other areas. Better documentation resulted, including the creation of the Estimation Manual, improved and additional Policy and Standards Memorandums, other on-line manuals, and internal FO procedures (e.g. List Frame). Ideas and innovations were shared throughout the agency, such as the use of new software and procedures for using charts and spreadsheets for data analysis. TRTs have provided more consistency and standardization of procedures. Also, general awareness of Agency standards has been increased. The units being reviewed receive benefits in two ways: preparing for the review and implementing the recommendations.

Technical reviews have made many specific recommendations to headquarters units in additions to the ones made to the FOs being reviewed. From the 20 reviews conducted in field offices in 2005-2006, 331 recommendations were made to headquarters units. Of these, 87 percent have been completed, and 9 percent more are being worked on. Similarly, 68 recommendations were made by the cattle headquarters review team. Of

these 68, 75 percent have been completed and another 16 percent are being worked on. The others are waiting on the availability of resources.

NASS produces a wide range of reports, over 200 each year, by a geographically distributed staff in 46 field offices with constant turnover in staff. The technical review program has unified the understanding and adherence to NASS standards.

11. Conclusion

Framework for the Future contains a warning quote from one of the group's members: "One man's standard is another man's barrier." The key to establishing and maintaining statistical standards is buy-in and acceptance of standards as part of everyone's job. This starts with support and adherence by senior management, but the people most responsible for the work need to also be responsible for establishing and maintaining the standards.