

# Annual Status of Education Report (ASER) and National Achievement Surveys (NAS): A Comparison

Currently two large-scale nationwide learning assessments are conducted in India at the elementary stage. Pratham/ASER Centre's Annual Status of Education Report (ASER) has been brought out annually since 2005. The National Council of Educational Research and Training (NCERT) has conducted National Achievement Surveys (NAS) periodically since 2001 for Classes III, V and VIII.<sup>1</sup> These two sources are frequently cited in discussions of learning outcomes in India. However, the two assessments are designed for different purposes and employ different methodologies. This note describes and compares these methodologies so that informed conclusions can be reached. The note is based on ASER 2006-2014 and the NAS reports available for different time periods for Classes III, V and VIII.<sup>2</sup>

## Implementing institution

**ASER** is facilitated by Pratham, a non-governmental organisation, and carried out by partner institutions in almost all rural districts of the country. These partner institutions may be universities, colleges, NGOs, or other types of formal or informal organisations.

**NAS** is carried out by NCERT under the mandate of the Government of India's flagship programme for elementary education, Sarva Shiksha Abhiyan, to "monitor improvement in children's learning levels and to periodically assess the health of the government education system as a whole".<sup>3</sup>

## Objectives

The **ASER** survey is designed to generate district, state, and national level estimates of children's schooling status for all children aged 3-16, and estimates of basic ability in reading and arithmetic for all children aged 5-16. It is designed as a household-based survey so as to include all children: those enrolled in government schools, private schools, other types of schools, and those not enrolled in school. ASER aims to assess whether children have attained basic reading and arithmetic skills.

The purpose of the **NAS** surveys, according to NAS documents, is to "obtain an overall picture of what students in specific classes know and can do and to use these findings to identify gaps and diagnose areas that need improvement." NAS is therefore designed as a school-based survey of students enrolled in Classes III, V and VIII in government and government-aided schools. It is a grade level assessment, intended to assess children's learning outcomes relative to the curriculum for their class.

## Sampling and coverage

**ASER's** objective is to reach all rural districts each year. It is a nationwide sample-based household survey. It employs a two-stage sample design. At the first stage, 30 villages are selected in each rural district from the Census 2001 directory using Probability Proportional to Size (PPS). In the second stage, 20 households are randomly selected in each village. All children aged 3-16 in sampled households are surveyed. All children aged 5-16 are assessed.

ASER 2014 reached 341,070 households in 577 rural districts. 569,229 children aged 3-16 were surveyed, of which 408,074 children aged 5-16 were assessed on the ASER Reading tool and 407,706 children aged 5-16 were assessed on the ASER Arithmetic tool.

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<sup>1</sup> The following NAS assessments have been carried out so far:  
Cycle 1: Class V (2001-02), Class VIII (2002-03) and Class III (2003-04)  
Cycle 2: Class V (2005-06), Class VIII (2007-08) and Class III (2007-08)  
Cycle 3: Class V (2009-11), Class VIII (2010-13) and Class III (2012-13). Source (NCERT).

<sup>2</sup> Much of the NAS information in this note is based on documents available on the MHRD website under National Achievement Surveys. See [http://ssa.nic.in/page\\_portletlinks?foldername=NAS](http://ssa.nic.in/page_portletlinks?foldername=NAS). For more detailed comparisons of NAS, ASER and other assessments see Oza and Bethell (2013), *Assessing Learning Outcomes: Policies, Progress and Challenges*. Sarva Shiksha Abhiyan. DFID, New Delhi.

<sup>3</sup> NCERT, Education Survey Division. National Achievement Survey (Cycle 3) Class III: Achievement Highlights 2014, p.1

**NAS** aims to cover all 35 states and union territories. It is a national survey that is school-based and focused on specific classes in particular years. NAS employs a three-stage cluster design. In the first stage, districts are selected using PPS. In the second stage, the requisite number of schools are chosen within sampled districts, again using PPS. In the third stage, students are randomly selected within sampled schools.

The most recent NAS (cycle 3) **Class VIII** survey was administered in 2012. The survey comprised a sample of 188,647 students and 24,486 teachers from 6,722 schools across 33 states/union territories.

NAS (cycle 3) **Class V** was implemented from 2009 to 2011 in 31 states/union territories. It covered 122,543 children from 6,602 urban and rural schools.<sup>4</sup>

NAS (cycle 3) **Class III** was conducted in 2013 in 34 states/union territories and covered a sample of 104,374 students in 7,046 schools.

### **Tools and testing**

**ASER** assesses early reading and basic arithmetic ability, which are foundational skills fundamental to literacy and numeracy acquisition. All children aged 5-16 are administered the same tests, regardless of schooling status or age.

Early reading ability implies the acquisition of letter knowledge, ability to decode Std. I and II level words and fluently read Std. I and II level passages. ASER tools are designed to assess mastery of these foundational skills and are not intended to differentiate within each mastery level. For instance, among the group of children identified as fluent readers of Std. II level text, the ASER assessments are not designed to differentiate between their ability to read and to comprehend.

The highest level tested in reading is a Std. II level text. The highest level tested in arithmetic is a 3-digit by 1-digit division problem, usually taught in Std. III or IV.

All ASER tools and testing procedures are available in the public domain.

**NAS** assesses grade level competencies. Therefore, children are administered different tests depending on the class in which they are studying. All cycle 3 surveys have used Item Response Theory (IRT).

The NAS (cycle 3) Class VIII achievement tests were developed in four subjects (language, mathematics, science and social science). The Class VIII test forms are based on common core content and competencies identified from an analysis of state textbooks.

Similar work was done for the development of the tools used in NAS Class V (cycle 3). The Class V survey included language (including reading comprehension), mathematics and environment science. Tools, testing procedures, and grading rubrics for the writing task are not in the public domain.

NAS (cycle 3) Class III survey assessed two subjects – language (listening, recognition of words and reading comprehension) and mathematics (numbers, basic operations, measurement, data handling, patterns, money and geometry).

### **Test administration**

**ASER** is a household survey. ASER reading and arithmetic assessments are administered one on one in an oral format. Children are tested at home. All children age 5-16 are given the same test, regardless of schooling status, age, or grade.

<sup>4</sup> This round of NAS used DISE 2007-08 as the sample frame. The report notes significant discrepancies between DISE data and actual school enrollments.

**NAS** is conducted in school (government and government aided schools).<sup>5</sup> Children of different classes are given different tests. For example, NAS tests (cycle 3) for class V and class VIII are pen-and-paper tests administered to a group of students in school. The cover of the test booklet has instructions for students indicating how to record or modify their responses. In addition to pen-and-paper tests, the NAS (cycle 3) Class III survey had listening comprehension items in which children marked multiple choice answers based on a passage read aloud by the investigator.

### **Process implementation and monitoring**

**ASER** is conducted each year by surveyors from partner organisations in each district. These include District Institutes of Education and Training (DIETs), teacher training colleges, universities, NGOs and others.<sup>6</sup> Surveyors receive an intensive 2-3 day training in preparation for the survey, including a day of practice in the field. ASER devotes considerable time and effort to ensuring data quality through carefully designed and implemented training, monitoring, and desk and field recheck procedures, details of which are provided in each year's report and on the ASER Centre website. External process audits of the ASER field work and data collection process are also conducted periodically.

**NAS** is coordinated by NCERT with the support of state agencies such as SCERTs/State Institutes of Education (SIEs) in the states and union territories. All coordinators at state and district level are trained on field level data collection. A detailed guideline cum training manual was developed by Education Survey Department (ESD). In each selected district, a team of two field investigators is appointed by the district coordinators. They are given rigorous training on selection of students in the sampled schools, administration of tools and recording of responses by students in OMR sheets. It is not clear whether field practice is included as part of the training of field investigators.

Monitoring guidelines are laid out by NCERT for NAS. Monitoring at all levels is expected from supervisors. For example for the NAS (cycle 3) Class III survey, 5-10 schools were to be monitored in each district. After data collection, OMR sheets, tests, questionnaires and field notes etc. were verified at the district level for correctness of numbers, codes and other information, and then sent to the state coordinators. The response sheets in OMR format were then dispatched by the state coordinators to the respective Regional Institutes of Education (RIEs) or NCERT for scanning, scoring and analysis.

### **Accuracy of estimates**

**ASER** estimates are self-weighting at the district level. At the state and national levels, estimates are weighted by the appropriate population weights. ASER does not report standard errors and margins of error for its state and national estimates. However, a study done on the precision of ASER learning and enrollment estimates shows that margins of error are well within 5% at the state level. In addition, a detailed check of sample sizes is done for smaller states where sample sizes can be small for some sub-populations. Where the number of observations in the sample is found to be insufficient, estimates are not presented in the report. Since 2011 ASER reports also present estimates at divisional level, along with the associated standard errors and margins of error.

**NAS** (cycle 3) surveys are based on more sophisticated technical work than previous surveys. While this cycle of surveys can be compared to future student achievement surveys, the NAS documents clearly state that due to technical difficulties the results from this cycle cannot be compared with previous rounds. Standard errors are provided for the NAS estimates.

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<sup>5</sup> Although the issue of children's attendance is not explicitly addressed in NAS documentation, the NAS-Class V report states that within each school, children were selected from class registers using simple random sampling, implemented via a lottery (p.177). This seems to imply that only children present in the school on the day of the test were included.

<sup>6</sup> 243 DIETs from 12 states participated in the ASER 2014 survey.

## Availability of results

**ASER** findings are made available in the same school year that the fieldwork is conducted. The survey is conducted between September and November of each year and the report is published the following January. District, divisional, state, and national level estimates are in the public domain.

**NAS** (cycle 3) Class VIII data collection was done in 2012 and the report was released in 2014. The Class V fieldwork was conducted between November 2010 and March 2011, and report was released in July 2012. These reports are available on the NCERT website. **NAS** (cycle 3) Class III survey was conducted in 2013 and the report was released in 2014.

## Test reliability and validity

**ASER** testing tools assess achievement of mastery rather than the performance of children relative to their peers. Reliability in this case refers to the consistency of the decision-making process in assigning children to a mastery level across repeated administrations of the test. In addition, since examiners assign each child to a mastery level, it is important to also estimate the consistency of the decision-making process across examiners, which in technical terms is referred to as inter-rater reliability. A series of studies indicates substantial reliability of decisions across repeated measurements (test-retest) and satisfactory inter-rater reliability.

The validity of the ASER reading test (that is, whether the test actually measures the constructs it is intended to measure) was examined using the Fluency Battery as a criterion measure for estimating the validity of the ASER Hindi language tool. The Fluency Battery is a test of early reading ability adapted from the Early Grade Reading Assessment (USAID, 2009) and the Dynamic Indicators of Basic Early Literacy Skills (University of Oregon Center on Teaching and Learning, 2002). The ASER language assessment is strongly associated with the Fluency Battery. The magnitude of the correlation coefficients range from .90 to .94 (a correlation coefficient of 1 indexes a perfect and positive association between two measures).<sup>7</sup>

**NAS** (cycle 3) has used much more sophisticated techniques than those used in previous cycles. The Class V reports reliability coefficients for all three subjects. Class VIII report also indicates that the reliability of the test score scales was estimated from the IRT scaling.

## Comparisons over time

**ASER** has used the same sampling procedures since 2006. The reading assessment tool has not changed since the first survey in 2005, and the math tool has not changed since 2007. Therefore all estimates generated since 2007 are comparable.

In the latest cycle - **NAS** (Cycle 3) Class III, Class V and Class VIII reports use item response theory (IRT) to analyse the data, unlike earlier two cycles of the survey which used classical test theory (CTT). **NAS** reports point out that the results of the most recent cycle are therefore not comparable with those of earlier years.<sup>8</sup>

## Conclusions

Although both ASER and NAS are large scale assessments of learning, they are not designed for the same purpose. Therefore, as described in this note, they are very different in terms of sampling, test design and content, methodology of assessment and time frame. Equally importantly, the assessment results are computed very differently. Since estimates generated by these assessments neither cover the same populations nor assess the same content, their results are not comparable.

<sup>7</sup> See papers by Shaher Banu Vagh (2009 and 2013). Available at <http://www.asercentre.org/sampling/precision/reliability/validity/p/180.html>

<sup>8</sup> See Oza and Bethell (2013). This document cites other technical studies that indicate that comparisons between previous surveys could not be done due to technical difficulty. This issue was also discussed and accepted in the Joint Review Mission of SSA in 2009.