# ECONOMIC ANALYSIS

## A. Sector Context and Economic Rationale

1. Mongolia is a sparsely populated country, in which 26.1% of the economically active population was engaged in nomadic herding in 2014. The school dormitory system in Mongolia was developed to ensure access to education for all school age children, especially those from herder families who live a nomadic life. In school year 2014/15, there were 486 publicly funded school dormitories (about 62.0% of public primary and secondary schools had dormitories), in which 32,858 primary and secondary students stayed (6.9% of students enrolled in public primary and secondary schools) for the 9-month school period. Students from herder families accounted for 77.6% (25,491) of those who stayed in dormitories.

2. The availability of fully publicly funded school dormitories affects access to education. The government introduced parental fees for dormitory meals and other services in 1995 because of cuts in public spending on education, which resulted in a decrease in the number of students staying in dormitories, and a drop in student enrollments in primary and secondary education. Both the number of students staying in dormitories and student enrollments increased considerably when full government financing of dormitory services resumed in 2000. Public provision of school dormitory services in Mongolia is supported by its effect on access to education, particularly given that the Education Law stipulates that all school age children receive 9 years of free compulsory education. The number of students who stayed in dormitories and the gross enrollment ratios (GERs) before and after the major policy changes to the school dormitory system in 1995 and 2000 are in Table 1.

**Table 1: Number of Students in Dormitories and Gross Enrollment Ratios in Selected School Years**

| Item | School Year | | | | | |
|---|---|---|---|---|---|---|
| | 1994/95 | 1995/96 | 1996/97 | 1999/2000 | 2000/01 | 2001/02 |
| No. of dormitories | 366 | 341 | 331 | 348 | 351 | 380 |
| No. of students in dormitories | 21,364 | 18,867 | 17,649 | 19,567 | 27,435 | 27,978 |
| No. of students from herder families in dormitories | 20,260 | … | … | 16,614 | 22,217 | 23,844 |
| GER at Primary Level | 87.0 | 87.0 | 91.6 | 95.6 | 97.9 | 100.5 |
| GER at Secondary Level | 62.7 | 69.0 | 61.1 | 61.1 | 74.0 | 71.3 |

GER = gross enrollment ratio.
Sources: Ministry of Education, Culture, and Science; United Nations' Educational, Scientific, and Cultural Organization Institute for Statistics.

3. The school dormitory system has been identified by the Ministry of Education, Culture, and Science (MECS) as one of 11 areas of reforms to ensure equity of access to quality education under its education sector reform policy framework, 2012–2016. The majority of dormitories were built in the 1970s and 1980s, and have become increasingly unfit for accommodating students because of chronically low levels of capital investment. In addition, many school dormitories in remote rural areas lack access to basic infrastructure (water, wastewater, heating) and properly functioning water, sanitation, and hygiene (WASH) facilities. Although public spending on education in Mongolia has been higher (above 5% of gross domestic product) than in other lower middle-income countries, a large share has been devoted to covering relatively high recurrent costs derived from the country's low population density and harsh winters. The resulting shortage of funds for capital investment has conventionally been relieved by donor financing. Moreover, dormitory staff, teachers, school management, and local

education departments lack the capacity needed to make dormitory services more child-centered in line with ongoing MECS education sector reforms. A major challenge to reforming the school dormitory system is the lack of models to improve the physical dormitory environment and services, coupled with the need for enhanced policy and regulatory frameworks and financing policy.

## B. Demand Analysis

4. The demand for school dormitory services is strong—the number of students who apply for dormitories has always exceeded the number of beds available. National figures for the number of students who applied for and stayed in dormitories in selected school years are in Table 2.

**Table 2: Number of Students Who Applied for and Stayed in Dormitories (Primary and Secondary Education) in Selected School Years**

| Item | School Year | | | |
|---|---|---|---|---|
| | **2001/02** | **2006/07** | **2011/12** | **2014/15** |
| No. of dormitories | 380 | 493 | 511 | 486 |
| No. of students in dormitories | 27,978 | 42,986 | 38,065 | 32,858 |
| No. of students from herder families in dormitories | 23,844 | 37,930 | 38,065 | 25,491 |
| No. of students who applied for dormitories | 41,448 | 51,167 | 41,542 | 35,528 |
| **Students in dormitories as a proportion of those who applied (%)** | **67.5** | **84.0** | **91.6** | **92.4** |

Source: Ministry of Education, Culture, and Science.

5. **Affordability.** School dormitory services are provided free of charge, including a bed, three meals per day, and a certain level of security. Parents often contribute personal care items, bedding, and sometimes furniture, for their children. Interviews conducted with herder families and school staff as part of the social and poverty analysis revealed that a factor affecting the affordability of school dormitory services—and, as a consequence, the number of students who stay in them—are requests for monetary contributions (about MNT40,000–MNT50,000) from each student for repair and maintenance works of dormitory buildings. This practice is not uncommon, given the limited school budgets for repair and maintenance works.

6. **Regional and poverty dimension.** The demand for school dormitory services has a regional dimension. The unmet demand is noticeable in the western region, where large numbers of school dormitories are located. In particular, the region had the lowest proportion of students in dormitories to those who applied for dormitories in 2014 (Table 3).

**Table 3: Students in Dormitories as a Proportion of Those Who Applied (Primary and Secondary Education), 2014**

| Item | Region | | | | |
|---|---|---|---|---|---|
| | **Western** | **Highlands** | **Central** | **Eastern** | **Ulaanbaatar** |
| No. of dormitories | 146 | 139 | 122 | 61 | 16 |
| No. of students in dormitories | 11,691 | 9,666 | 7,422 | 3,007 | 1,048 |
| No. of students who applied in dormitories | 12,656 | 10,302 | 7,934 | 3,234 | 1,120 |
| **Students in dormitories as a proportion of those who applied (%)** | **92.4** | 93.8 | 93.5 | 93.0 | 93.6 |
| No. of students in dormitories from herder families | 10,065 | 8,491 | 5,079 | 2,000 | 298 |
| No. of students from herder families who applied | 10,996 | 8,588 | 5,624 | 2,119 | 305 |
| **Students from herder families in dormitories as a proportion of those who applied (%)** | **91.5** | 98.9 | 90.3 | 94.4 | 97.7 |

Source: Ministry of Education, Culture, and Science.

7. Moreover, the demand for school dormitory services is generally higher in the regions that have large numbers and proportions of the population engaging in herding, and have considerable proportions of herder households among households below the national poverty line (Table 4).

**Table 4: Herder Households and Their Poverty Status by Region**

| Item | Region | | | | |
|---|---|---|---|---|---|
| | Western | Highlands | Central | Eastern | Ulaanbaatar |
| No. of herder households, 2014 | 59,513 | 78,330 | 45,959 | 24,575 | 4,986 |
| Herders as a proportion of the economically active population, 2014 | 45% | 47% | 29% | 39% | 1% |
| No. of herder households, 2012 | 57,560 | 77,481 | 44,117 | 23,739 | 4,927 |
| Herders as a proportion of the economically active population, 2012 | 39% | 45% | 30% | 37% | 1% |
| Herders as a proportion of poor households, 2012 | 41.9% | 46.5% | 23.8% | 17.8% | 1.2% |

Source: National Statistical Office of Mongolia.

8. Establishing and implementing models to improve the physical school dormitory environment and services in the western region, which would contribute to increasing the affordability of and meeting the largest unmet demand for dormitory services, is expected to particularly benefit children from poor herder families. About 3,900 primary students (including 3,300 from herder families) and 7,400 secondary students (including 6,300 from herder families) staying in 83 dormitories in the region will directly and/or indirectly benefit from the project.

## C. Cost-Effectiveness Analysis

9. The cost-effectiveness analysis was undertaken in accordance with the Asian Development Bank (ADB) guidelines.[1] The analysis reviews the cost and anticipated effects of different project alternatives, because a monetary measure of the project's potential benefits could not be provided.

10. The project will support reform of the school dormitory system in Mongolia by establishing and implementing models to improve physical dormitory environment and services in three *aimags* of the western region. The project will have the following three outputs: (i) physical school dormitory environment improved by supporting minor civil works of *soum* school dormitories in Govi-Altai, Uvs, and Zavkhan *aimags*, including rehabilitation of buildings to adequately cope with winter temperatures, wind, and precipitation; repair and/or installation of universal design WASH facilities; provision of beds and other furniture to accommodate more students; and renovation of common rooms for study, reading, and extracurricular activities; (ii) capacity to deliver school dormitory services improved by developing capacity of dormitory staff and primary class teachers, school management and accountants, and *aimag* education department staff; and organizing workshops for dormitory teachers, primary class teachers, and social workers to exchange experiences in student- and teacher-organized study, reading, and extracurricular activities at dormitories; and communication and outreach activities for parents of primary students staying in dormitories; and (iii) policy and regulatory frameworks to improve the school dormitory environment developed, including comprehensive standards for physical dormitory environment and services, revised funding formula for dormitory meals, and a national strategy and financing policy to improve the school dormitory environment.

[1] ADB. 1997. *Guidelines for the Economic Analysis of Projects.* Manila; ADB. 1994. *Framework and Criteria for the Appraisal and Socioeconomic Justification of Education Projects*. Manila.

11. **Effects of improved physical school dormitory environment.** A national assessment of primary math and reading conducted in 2008 indicated that the academic performance of students who stayed in dormitories was lower than that of those who commuted to schools from home. The same assessment also identified factors related to the physical environment that influenced the academic performance of students, such as the availability of WASH facilities and adequate heating systems.[2] Many school dormitories in rural remote areas lack properly functioning WASH facilities, heating systems, or basic protection from precipitation and wind. Evidence from other countries also suggests that the physical environment impacts the academic performance of students.[3]

12. **Effects of improved dormitory services.** Interviews with school staff conducted as part of the poverty and social analysis suggested that students staying in dormitories lack meaningful communication and interactions with adult care givers in relation to their learning, and have little opportunity to engage in study, reading, and extracurricular activities at dormitories, which is likely to affect their academic performance. The assessment (footnote 2) found that students who received encouragement and support from their parents, and those who had books and other learning materials at home, performed better than those who did not. These findings are consistent with evidence from other countries regarding the impacts of parental support and home environment on primary-level students.[4]

13. Enhancements to the school dormitory physical environment and services are expected to improve both access to and the quality of education. In 2012, the western region had the lowest primary completion rate (86.1%), far below the national average of 94.5%. Children in the region tend to start school later than the official school age of 6 (about 14%), largely because parents are reluctant to send young children to school dormitories with a poor physical environment and services, and where no older siblings stay to take care of the younger children. The academic performance of students who entered school at the age of 7 or 8 is lower than that of students who started school at the age of 6 (footnote 2).

14. **Cost analysis.** The following three project alternatives, which vary in the average investment cost per school dormitory depending on various inputs (civil works, materials, and trainings), are considered:

(i) **Project case:** Upgrading of dormitory buildings (around 700 square meters [$m^2$] and 100 beds) and WASH facilities ($90,000); provision of equipment and furniture ($4,500); capacity building of dormitory staff, teachers, and school management; and provision of books teaching-learning and other materials for

[2] Education Evaluation Center of Mongolia. 2008. *Mongolian National Assessment of Primary Education Mathematics and Reading*. Ulaanbaatar.

[3] M. Edwards. 1992. *Building Conditions, Parental Involvement, and Student Achievement in the D.C. Public School System* (unpublished master's thesis, Georgetown University). Washington, D.C. This study found that after controlling for other variables such as a student's socioeconomic status, students' standardized test scores were 6% lower at schools with poor building conditions than at those in fair condition, and 11% lower than those in excellent condition. C. Cash. 1993. *A Study of the Relationship Between School Building Condition and Student Achievement and Behavior* (unpublished doctoral dissertation, Virginia Polytechnic Institute and State University). Blacksburg, VA: This study examined the relationship between physical school environment and student learning achievements in small, rural Virginia high schools. Adjusted for socioeconomic status, students' test scores were found to be up to 5 percentile points lower in physical school environments with poor quality ratings, related to substandard science facilities, air conditioning, locker conditions, and classroom furniture; more graffiti; and noisy external environments.

[4] W. Jeynes. 2007. The Relationship between Parental Involvement and Urban Secondary School Student Academic Achievement: A Meta-Analysis. *Urban Education,* 42(1): 82–110; E. Stewart. 2008. School Structural Characteristics, Student Effort, Peer Associations, and Parental Involvement: the Influence of School- and Individual-Level Factors on Academic Achievement. *Education and Urban Society.* 40(2): 179–204.

study, reading, and extracurricular activities ($1,500); resulting in an average investment cost per dormitory of $96,000.

(ii) **Alternative 1:** Construction of a new dormitory (around 700 $m^2$ and 100 beds) with capacity building of dormitory staff, teachers, and school management; and provision of books, teaching-learning and other materials for study, reading, and extracurricular activities ($1,500); resulting in an average investment cost per dormitory of $531,000, based on the cost of the MECS's standard dormitory.[5]

(iii) **Alternative 2:** The same interventions as the project case, except that *aimag*-level one-off training workshops rather than school-based continuous capacity-building activities for dormitory staff, teachers, and school management are organized ($1,000), leading to an average investment cost per dormitory of $95,500.

15. **Cost-effectiveness analysis.** The cost-effectiveness of each alternative is qualitatively analyzed by taking into account the average investment cost per dormitory, the anticipated effects, and other consequences, as shown in Table 5.

**Table 5: Cost-Effectiveness Analysis of Three Project Alternatives**

| Alternative | Cost | Anticipated Effects | Other Consequences | Evaluation |
|---|---|---|---|---|
| Project Case | $96,000 | (i) Better academic performance of students staying in dormitories due to improved physical dormitory environment and support for study, reading and extracurricular activities<br>(ii) School entry at the age of 6<br>(iii) Completion of primary education | (i) Upgrading of dormitory buildings and WASH facilities at better standards, leading to lower maintenance costs<br>(ii) Synergetic effects of different types of investments | The most cost-effective option as it would produce synergetic effects of different types of investments and have low maintenance costs |
| 1 | $531,000 | (i) Better academic performance of students staying in dormitories due to improved physical dormitory environment<br>(ii) School entry at the age of 6<br>(iii) Completion of primary education | (i) MECS's new dormitories deteriorate quickly<br>(ii) WASH facilities are not fully functional if dormitories are not connected to water and wastewater systems | (i) The most expensive option to produce similar effects to the Project Case<br>(ii) Maintenance cost may be higher |
| 2 | $95,500 | Better academic performance of students staying in dormitories due to improved physical dormitory environment | (i) Upgrading of dormitory buildings and WASH facilities at better standards, leading to lower maintenance costs<br>(ii) Students receive insufficient care and support | The least-cost option, but with effects reduced to half because dormitory staff–teacher–school management collaboration to provide care and support for students is not promoted by *aimag*-level one-off training workshops. |

MECS = Ministry of Education, Culture, and Science; WASH = water, sanitation, and hygiene.
Source: Asian Development Bank.

16. **Conclusion.** When the cost is considered in combination with the anticipated effects, the project interventions were assessed as the least-cost, most effective option.

[5] MNT1.05 billion, converted into dollars using an exchange rate of $1 = MNT1,983.