CHILD FRIENDLY SCHOOLS

CHAPTER 3

Location, design and construction

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LOCATION, DESIGN AND CONSTRUCTION

Construction projects provide ample ways to play a strong role in the overall plan: ensuring community participation in the process; ensuring adherence to child-friendly principles in building design and construction; and ensuring that the end results contribute to realizing goals for children and women. [Education agencies] that decide to engage in construction, therefore, must go beyond the mere 'bricks and mortar' aspects, and also take into account 'software' aspects in the planning. These include the maintenance and use of facilities, the quality of services, how the community is mobilized, the extent and nature of community participation. All of these should be determinants of success for [agency-assisted] construction projects. In short, whether or not to engage in construction is a programmatic decision.

Extract adapted from Construction Guidance Note (Draft), UNICEF, Programme Division, October 2006

3.1 INTRODUCTION

Child-friendly schools are not architectural phantoms from a strange place. They are schools with attributes typically associated with good schools in many countries. However, they have additional elements that complement and reinforce the principles and practices of the child-friendly approach to education.

This chapter examines the planning and design of new spaces and environments for child-friendly schools and sets out quality planning standards for improving existing schools and temporary structures used as schools. It focuses on location, design, construction, operation and maintenance of new child-friendly schools and the important factors for renovating and adjusting existing schools to make them child-friendly. The approach centres on the child, the main user of these learning spaces and environments, with the understanding that family and community participation is fundamental for best results. In this regard, the main objectives in child-friendly school planning are:

- Attract students (increase access);
- Improve attendance rates;
- Improve retention and completion rates;
- Improve learning achievement;

- Provide safe, inclusive, welcoming environments for all children;
- Provide enabling learning environments, including accommodating children with physical and mental/learning disabilities;
- Build a sense of community within the school (institutional ethos);
- Involve parents and the community (support and participation);
- Cultivate harmony between the school and its community;
- Harmonize buildings, school grounds and environment as children interact with them.

3.1.1 General approach and key considerations

A structure for learning (school) and its immediate environment (school grounds) must offer basic minimum standards to encourage and facilitate the main objectives of a child-friendly school. These have much in common with any good school; therefore the child-friendly school needs to be conceived as an improvement on the basics of existing good schools. A child-friendly school also must respond to the environmental and cultural context of its location. A universal, standardized approach does not respond to the unique characteristics of a place and culture and could result in detachment and alienation of the community.

School marks an important early milestone in the child's lifelong journey of intellectual and psychosocial development. Therefore, an understanding of the child's own culture and environment should have prominence in design considerations for a child-friendly school. This will help reinforce the child's self-identity and promote a sense of belonging to a place and group.

When their architecture is a reflection of the community, culture, natural environment and the family, schools are more than just shells or physical structures. When a school is envisioned and created with the child at its centre and supported by the family and the community, the physical structures become interactive places to learn and teach – places where teachers facilitate and manage the learning process and students learn and explore new possibilities that match their abilities and potential. The school becomes an integrated, holistic system that retro feeds itself from the surrounding elements, giving it an identity. It is this dimension that promotes community ownership of schools and gives schools a sense of belonging to the communities they serve. This dimension is one of the most essential considerations for the design of child-friendly schools.

Schools must be anchored in the reality of their location in terms of culture, environment and links to families and the community. But if that were all, schools would be parochial places antithetical to learning that is grounded in the total heritage of human knowledge. Schools are not simply a means of learning about local reality; they are also the gateways to the legacy of human endeavours and possibilities.

School architecture should promote harmony with local reality while also incorporating the best external influences. A remote, rural school,

for instance, should conform to its environment but also take advantage of such innovations as modern hygiene practices, popular games and sports, and technology. Similarly, a school can reflect the local authoritative hierarchy and a culture of respect for elders, while also promoting such values as children's participation in their learning process and giving them a voice in the school as a whole. The architecture of the child-friendly school can promote both harmony with the local environment and openness to the benefits of external influences. This is an important challenge in the architecture and design of any good school, particularly so for child-friendly schools.

3.1.2 Basic elements for a good school

The basic planning and design requirements that make for a good school are the foundation on which further elements can be added to turn them into child-friendly schools. The challenge in many countries goes beyond simply designing and building new schools that are child friendly to renovating and converting existing schools into child-friendly schools. The extent of this latter challenge depends on what already exists and whether they are actually 'good' schools. Table 3.1 summarizes basic planning and design standards related to a good school.

3.1.3 Additional elements for a child-friendly school

Theoretical considerations and practical experience have generated additional elements that make the difference between a 'good' school and a 'child-friendly' school. Many major catastrophes have provided opportunities to create new school systems based on CFS principles from the ashes of old school systems.

In Bam (Iran), for example, the community, families and students worked together on a school design project to 'build back better' after the 2001 earthquake. In examples from African countries, new approaches were implemented not only to design schools but also to achieve active community participation in the creation, design and construction of an environmentally sound child-friendly school.

The possibilities for design of child-friendly schools vary among countries and areas. In some cases, there will be extensive parent and community involvement in all aspects of location, design, construction and maintenance; the focus could be on using local building materials and the skills of community artisans. In other cases, the issue might be conforming to sophisticated building codes and materials standards as well as providing for high-level technical supervision of building contractors. In all cases, the issue is to apply CFS principles in order to create a child-friendly school. (See Table 3.2.)

There are three elements in child development that are essential for child-friendly school design – safety, health and nutrition. These three must be adequately addressed if the school is to become an inclusive, holistic learning landscape that provides a safe, enabling learning environment where children can thrive.

TABLE 3.1: BASIC PLANNING AND DESIGN STANDARDS FOR EDUCATIONAL FACILITIES

Structure	The building is to be structurally stable, weatherproof according to local environmental conditions, climatically comfortable, easily exited in case of emergency and well integrated with the environmental and cultural context.
Administrative offices	Separate space for faculty/administrative personnel gives privacy to students and teachers and maximizes the use of classroom space, enabling staff to work separately from students. Proximity between classrooms and administrative offices is recommended to monitor students' activities and create 'safety through transparency'.
Safe water	Fresh potable water should be available to students within the school. Proper plumbing infrastructure allows for the distribution of safe water. If such a setup is not possible, a borehole/well should be included in the school compound. This can be augmented with a rainwater catchment system in the roof as appropriate.
Hygiene facilities	A separate space should be provided with water and soap or other cleaning agent for children to wash their hands.
Toilets/latrines	Separate toilets or latrines should be available for girls and boys. Privacy, cleanliness and safety are major considerations when planning location and design of facilities.
Light, air, sun, dust, glare, reflection, humidity, noise and odour	Classrooms need good fresh-air circulation to avoid heat and excessive humidity. To ensure adequate daylight, a minimum of 20 per cent of the classroom floor area should be window area. Electricity or another means of power is needed to provide light and to operate equipment. Classrooms must be sufficiently shaded from direct sunlight, glare (direct light) and reflection (indirect light). Schools should not be located close to sources of excessive noise (traffic, railways, industries, informal sector activities) or excessive pollution or odours (waste belts, abattoirs). When this is not possible, design measures should be used to minimize the impact of these problems.
Colour	Materials and finishes should be the light, natural colours of the materials themselves, selected in harmony with warm natural hues as accents (reds, oranges, maroons, ochres and linen/khaki/off-whites) dictated by local, cultural preferences. For example, timber may be finished using clear varnish to preserve the natural beauty and warmth of the material. Or brighter accents can be used for play corners, decks, corridors and furniture. Learning spaces should be light and relaxed in colour, not gloomy, dull or dark.
Power (electric or alternative)	The school should have a power source to provide light, connectivity for communication equipment (computers, radios, television) and other appliances (refrigerators, stoves). Alternative sources of energy (solar, wind and biogas) can be integrated into the design of schools where appropriate.
Safety provisions	Fire prevention and emergency evacuation plans must be part of the design process and built into the school programme. Combustible materials should not be used for structural purposes unless treated to resist fire. Construction materials should be free of components or elements that can be hazardous to children. When construction is finished, school sites should be free of all fluid, solid and gaseous wastes. Schools should not be located close to industrial or other hazards.
Health provisions	At a minimum, schools should have a first-aid kit or medicine cabinet for basic emergencies or accidents. Proximity to a clinic enables health personnel to visit the school periodically and permits children to be taken to the clinic for treatment of health problems. This proximity is accomplished in many developing countries through clustering the main social service facilities in the same location.
Library	A designated space where books and learning resources are available in a proper reading environment is central to learning and teaching activities. The library or resource room needs to be strategically located within the school for easy access, but away from noisy areas for a greater degree of quiet.
Landscaping	School grounds form an integrated, holistic unity with school buildings and their users, but in conventional school planning they are often neglected. Trees are vital for filtering sun, dust and noise and for beautifying the school. Indigenous trees, shrubs and flowers should be planted in the school compound along with edible plants meant to teach children food production and conservation. Trees also have a softening and calming effect on the learning environment and its users. Planning the school landscaping is a good way to involve children in the realization of a child-friendly school.

TABLE 3.2: ADDITIONAL FUNCTIONAL ELEMENTS FOR A CHILD-FRIENDLY SCHOOL

Flexible spaces	Flexible spaces increase child participation in class and allow teachers to provide a more dynamic environment for learning and teaching. Such spaces provide opportunities for group activities, areas for manual projects and easy access to open spaces. Individual classrooms or other facilities that create outdoor space between structures give students a chance to be in open areas when in transit between classes. Classrooms should be accessible for all children; ramps and wide doorways should be provided for less mobile children.
School library and resource room	In child-friendly schools, the library and resource room is likely to have some connection to the local community. Where it is feasible and in line with school practice, these facilities should be located and designed so they are accessible to the community. In other cases, skilled and knowledgeable persons in the community may be considered resources for learning about local culture, history and handicrafts.
Bathrooms	Teachers need to have separate facilities for men and women. For pupils, designated separate bathrooms for boys and girls within or close to the classrooms are the most practical and safest arrangement. These facilities can also be designed and located so that they are shared among clusters of classrooms to protect younger children.
Relaxation rooms close to learning areas	At the nursery and lower-elementary level, rooms where children can relax are appropriate in the design of child-friendly schools. In general, homelike elements next to learning spaces provide a friendly, inviting atmosphere for this age group.
Individual spaces	Along with flexible learning spaces for large and small groups (project-based learning/teamwork), individual learning spaces should also be provided, since individual children have their own learning styles and some will need space to be on their own at times to study or reflect.
Open spaces	Easy access to open spaces from classrooms allows children to be in close contact with their environment and to engage in physical activities. Open spaces can be designed as play yards for sports, school gardens and orchards, decks or verandas for outdoor learning activities, open performance spaces, wide corridors and courtyards, trellises, canopies, shaded pavilions, niches, alcoves, play lofts and enclosed backyards. In typical child-friendly schools, the community would be allowed to use some of these spaces after school hours for town meetings, local gatherings and other events.
Kitchen	Space for school meal preparation should be designed and provided with equipment and furniture that ensure food is kept fresh and away from flies and other pests that undermine food quality.
Clinic	Where there is a campus or cluster of social services, having the school near a clinic provides students with general health services and allows for the care of children in need of permanent monitoring of health conditions. Such a health facility would normally serve the entire community, either after school or by providing separate access for school and community patients. This basic link provides a connection between school, community and the family, revolving around the child's well-being.
Protective	The protective element of child-friendly school design has two main aspects: • To counteract bullying and abuse, teachers and parents must be trained in non-violent, child-based discipline strategies and interventions. This means no beatings, canings or other humiliating forms of punishment. Designing classrooms and other spaces so that activities are readily visible from the outside can deter child abuse. • Depending on location and context, the enclosure and boundaries of schools can vary in form and function. The goal is to find a balance where a fence can provide protection to the child from outside elements (such as traffic, animals), can define boundaries to keep children within the school and can also serve to section off an area for gardening and orchards.

3.2 PEDAGOGY AND DESIGN

Learning is at the heart of schooling, and anything that facilitates learning should be at the core of school design. This inherent principle gives rise to key elements in the design of schools. For instance, it is obvious that healthy children learn better than sick ones, and that children are particularly vulnerable to illnesses in hostile environments. School design should include health protection, which allows children to be at their best. Designated hand-washing areas and first-aid kits, for instance, are important aspects of child-friendly schools.

School design must be in tune with children's normal developmental stages. Children learn differently at different stages of development. For instance, younger children do not have the same skills, knowledge and ability to learn complex concepts as older children. Developmental differences are important not only in the design of child-friendly schools, but also in the selection of teaching/learning materials, the creation of learning/teaching spaces and the selection of school furniture.

There are many other factors that influence a school's physical design, such as local environmental and climatic conditions, building materials, level and availability of local human capacity, resources and priorities. In the same way that the CFS model itself is not a blueprint, there is no blueprint for the design of child-friendly schools, but there are guidelines that illustrate how child-friendly principles help generate standards for high quality in a variety of circumstances.

Experience with child-friendly schools suggests that school sizes should ideally be kept to a maximum of 60 to 75 children in preschool, 200 to 400 in elementary school and 600 to 800 in secondary school. Research shows that, compared to large schools (more than 2,000), small schools (100 to 150 children) offer children greater opportunities to participate in extra-curricular activities and sports and

to exercise leadership roles, critical elements of a child-friendly school.

Improved school facilities and up-to-date technology are widely recognized to enhance learning, boost students' and teachers' morale, increase motivation, modernize educational methods (interactive self-learning) and enable teachers to focus on facilitating learning rather than on confronting problems caused by dated systems. However, these facilities and modern technology can only bring about improvements if there is also quality teaching, effective management and an encouraging environment for children to engage with such technology. In this regard, experience with child-friendly schools has highlighted the importance of buildings that encourage flexible, participatory approaches and enable innovative learning and teaching methodologies through multiple opportunities for learning, both indoors and outdoors.

3.2.1 Classrooms

- **Size and space:** Classrooms can vary in size and serve different functions, with children moving from one to another for different purposes. Instead of being single-purpose spaces, they can allow for a number of different activities, such as reading, research, group work and art. Direct access to the outdoors from the classroom enables children to make better use of the outdoors as a learning resource, but there should be one or more intermediate spaces (e.g., corridors) that link the outdoors with the indoor learning environment. In that way, there will be a range of learning spaces gradually changing in character – and multiple learning opportunities.
- **Safety:** Transparency in school design, so people can look inside the classroom and other school units, can protect children from abuse by teachers or older students, particularly during after-school hours. (See Chapter 5.)
- **Mobile furniture:** In child-friendly schools, mobile furniture replaces benches or desks that may have been bolted to the floor. The designer needs to consider the children's age group, so chairs and desks fit the students' sizes comfortably. When seats are movable, children can work alone or in groups. Chairs or stools are easier to move around than benches.
- **Children's home base:** Storage facilities in or near the classroom for children's class projects, artwork, bags and coats are necessary. Students need to have private, lockable storage areas to keep their belongings – even if just a tiny space.
- **National and international standards:** Classrooms need blackboards and, in the lowest grades, child-height rails for hanging students' work and posters. The range and expense of these vary widely. It is best to utilize local material and community maintenance. National and international standards exist and should be followed. A blackboard and teacher's desk in front of the classroom encourages a focus on the teacher as the resource for learning. If the teacher can move about, giving assistance to groups or individual students, children will be more actively involved.

Before design begins, it is important to know a country's existing building regulations. In some countries, the government may not have highly

defined regulations, or the regulations in use may not reflect current quality standards to protect against potential disasters, such as floods, hurricanes and earthquakes, or against hazardous conditions or toxic building materials and finishes. In that case, the planner should recommend the adoption of international standards for given hazardous profiles. Often a country adopts well-accepted building codes that may neither conform to the international codes nor be adequately enforced. The project must adopt on-the-ground standards and practices and ensure that the codes are enforced.

A child-friendly school should be innovative enough to offer ministries and communities a new opportunity to improve education quality. But innovations in space, form and shape, construction methods and building materials are sometimes resisted by the people completing the work. The resistance may be from contractors and materials suppliers who are unfamiliar with a technique or have not previously worked with the material, or it may originate in the Ministry of Education, the school's hierarchy or the construction inspection agencies.

This resistance can be a particularly serious issue if the ministry's pre-existing schools have recently failed during a natural disaster. These catastrophes can reveal that the school board and local contractors did not comply with proper quality precautions, constituting a possible case of fraud. In such a supercharged atmosphere, the presentation of innovative designs to an embattled ministry and construction industry may be undermined by negative publicity.

These situations call for careful, patient presentations as well as relationships built on trust. Innovations need to have tangible value. A full-scale model for testing or certification of quality by a well-respected institution may be needed to gain local approval, which is a crucial first step. Without this approval, construction will likely be delayed because of the community's misgivings about quality and risks. These delays can be costly, can damage the contractor's relationships and create negative impressions with funding partners. For this reason, the final architectural design, technical working drawings and construction details, which include all innovative design decisions, must be reviewed and officially approved before contracts are approved and construction begins.

3.2.2 Facilities

- **Toilets, water for hand washing and drinking:** Children and teachers need gender-separated toilets and water for hand washing and consumption. School toilets that provide privacy and facilitate menstrual hygiene (personal hygiene rooms) must be at a safe location and maintained in a non-discriminatory way. For adolescent girls and female teachers, washing places must be provided with enough water and privacy to wash and dry cloths and rags used during menstruation. Mechanisms to provide or replace cloths, pads or sanitary products for menstruation at school are also helpful.
- **Water recycling:** Water used for hand washing should be recycled and used to water the orchards and vegetable gardens. Human and animal waste could be utilized in the production of compost. The type of solutions should correspond to local conditions and be accepted by the communities.

- **Hygienic area for food vendors and school kitchen:** Food and nutrition are integral elements in educational programmes and in many ways as important as the school pedagogy. A separate area for a kitchen and the storage of food should be planned from the beginning. Bringing food and drink from outside the premises should be discouraged, because food brought from home or sold at kiosks/shops may not have been prepared hygienically or preserved according to acceptable health standards.
- **Storage of medicine:** A designated space should be set aside to properly store medicine. A refrigerated space may be required depending on the types of medications.
- **Health clinic:** A doctor's office integrated with the school layout can function as a school clinic and community health centre. Like nutritional status, children's health is crucial to the learning process.
- **IT centre and library:** An information technology centre should be equipped with computers, Internet connection and anything else that would allow students and the community to benefit from access to the World Wide Web.
- **Laboratory:** A separate classroom or an area within the classroom can serve as a basic laboratory for the study of natural sciences. Core areas for a small science cluster (physics/biology/chemistry) for both lower and upper primary and secondary schools should include such elements as teacher space, display space, charts, an emergency shower, outside biology court (potted plants, flowers, animals), storage space for equipment, well-ventilated storage space for toxic and acidic waste, a preparation room for lab experiments, and clean-up space with sink and water taps. The lab needs adequate natural cross ventilation and solar shading.

3.2.3 Outdoor spaces

- **Recreational space:** Ideally, every schoolyard should contain enough space for locally popular sports, games and extra-curricular activities (drama, singing, dancing) and for school eco-gardens, orchards and farms/woodlots. Children should be involved in laying out the games area since they understand the requirements. When space constraints make organized sports impossible, it is important to try to find alternative spaces within the community. Often the space available at the school site is limited, and administrators may be driven to maximize the classroom space at the expense of adequate open spaces for children to play. The designer and project team need to be sensitive to these competing priorities, yet emphasize the importance of recreation in the overall performance of the school. Sometimes the child-friendly school replaces damaged or destroyed classrooms. In these instances, the designer and project team need to balance the urgency of returning children to class with the need to remove waste and create spaces for recreation. A small budget for waste removal, land clearance and landscaping by the local community can reap large rewards. The school does not consist of buildings alone, but also of the school grounds, which for much of the year are just as important to learning as the buildings themselves.
- **School grounds and food production:** Children can be encouraged to help raise vegetables, fruits, domestic animals and fish, and the school

grounds can be used to help them learn effective methods of food production and conservation (making jams, chutneys, etc.). When choosing the foods to produce, it is important to create a culturally relevant experience. The production should be done in close consultation with the community. This will help avoid the potential to exploit children for school income-generating activities. Apart from the potential for food production, indigenous shrubs, plants and trees on the school grounds create learning opportunities and beautify the environment.

- **Fencing:** Planning should take into consideration the need for and type of fencing around a school. Often in rural settings, the school will need to be physically separated from the rest of the community in order to create a child-friendly space and maintain that space differently from the rest of the environment. The fence and gates are also important to protect the property during non-school hours. In the case of school gardens, the fence protects the garden from pilferage and animal pests.
- **Multifunction open-air stage:** When possible, an outdoor stage can serve as a classroom and performance space for certain classes or school activities. Such a space can also function as a meeting place for community activities after school hours since schools are sometimes the only places for communities to gather. Events may include graduation, opening of the school year and important holidays that parents, teachers and students celebrate at school.

Most child-friendly schools/spaces are in tropical (warm/humid) or arid (dry/hot) environments. Here, the use of outdoor spaces for teaching is common and should be included in the design. Often the school year will include several months during which study within walled classrooms is impractical because of high humidity or stifling heat. The same school year, however, will have months when using enclosed classrooms is necessary. In these cases, the design should include verandas or covered shade enclosures that enable the teacher and students to move easily from enclosed rooms to open spaces.

3.3 LOCATING SCHOOLS OR LEARNING SPACES

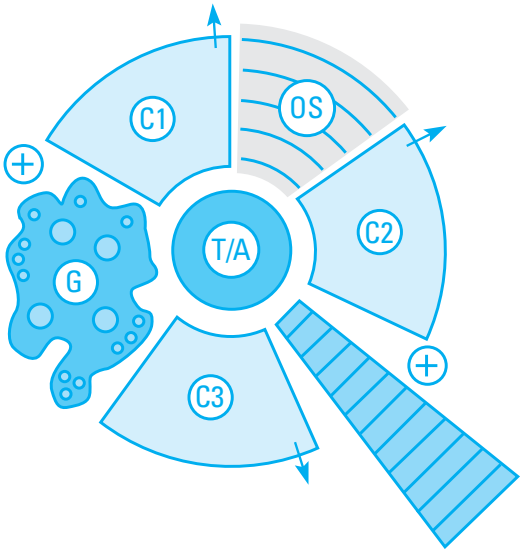
3.3.1 School size and location

The size of schools, where they are placed and the way they are arranged influence learning and how children relate to one another, adults and the community. Studies show that children prefer variety, flexibility and ease of maintenance in schools and learning spaces. In addition, children often state a preference for green spaces that include flowers, shrubs and trees – the latter as filters of sun, dust and noise and for shaded outdoor lunches, outdoor learning and beauty. Traditional school planning rarely considers these issues in the planning and design phases.

Schools and school grounds should be an integral part of the learning process. Buildings are not merely

shelters; they also serve as tools for learning and teaching. The size of each school and the layout and organization of the learning spaces and environments should be based on physical and curricular needs. Above all, spaces should be well defined, well proportioned, fit for multiple learning activities and integrated with outdoor spaces and environments.

DIAGRAM 1: SPATIAL ARRANGEMENT



C	Classroom
T/A	Teachers/administration
+	Intermediate spaces
G	Garden
OS	Open stage

Decisions about school locations must involve community members, including students, teachers and community leaders, along with government representatives from water and sanitation, health, parks and recreation, and social welfare. Locations should protect children from safety, health and environmental hazards, such as flooding, excessive noise, odour, dust, waste belts, fuel depots, small- and large-scale industries, traffic, crime and vandalism. A central location also promotes a sense of ownership among children and community members.

The school should ideally be within walking distance for all children. When children need to use transportation to get to school, the cost increases and poor children are likely to be excluded. Distance is also a major factor in girls' attendance. In an effort to enrol more children, the government of Uttar Pradesh, India, adopted a walking distance of 1.5 kilometres as the norm for schools in the plains and 1 kilometre in mountainous areas. A study in Egypt (Lone, 1996) showed 30 per cent enrolment for girls when schools were 3 or more kilometres from the children's homes and more than 70 per cent when they were within 1 kilometre of home.

The location of child-friendly schools is important for the safe and proper functioning of facilities. The school should be located where people live, either in the village or settlement it serves or close to it. This will make interaction between school personnel, children and parents easier and

provide a greater chance to foster teamwork. Child-friendly schools/ spaces must signal that teaching and learning are valued by the community.

3.3.2 Mobility

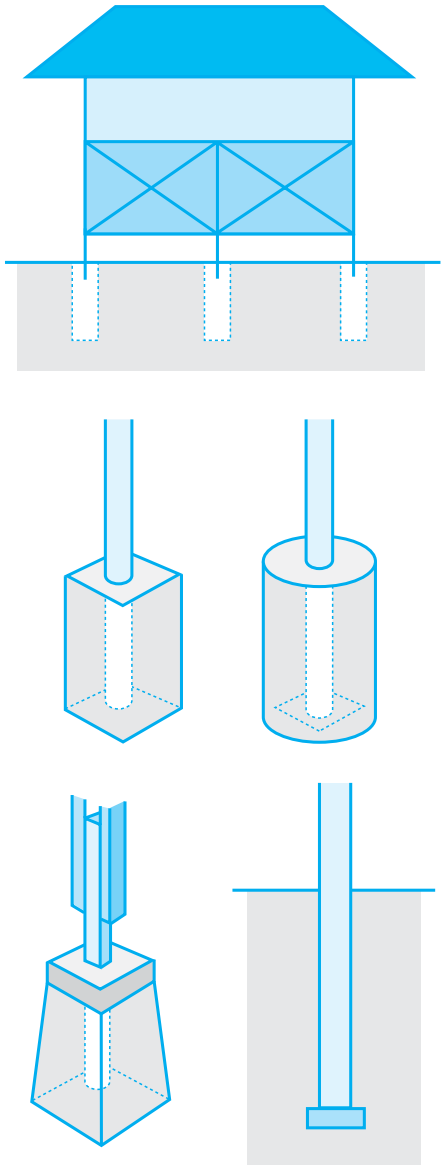
Schools do not have to be permanent structures. They can follow children in mobile communities. New schools can be designed to be quickly dismantled and moved with nomadic families to new locations.

The telecommunication revolution has spread globally, and countries with rich access to telecommunications have seen a rapid growth in virtual learning communities. Distance learning and cyber-schools and spaces are providing teachers and children in remote areas with access to resources previously unavailable. In Sierra Leone, for instance, teachers use the Internet to request assessment materials from international colleagues.

3.3.3 Assessment of topographical risk

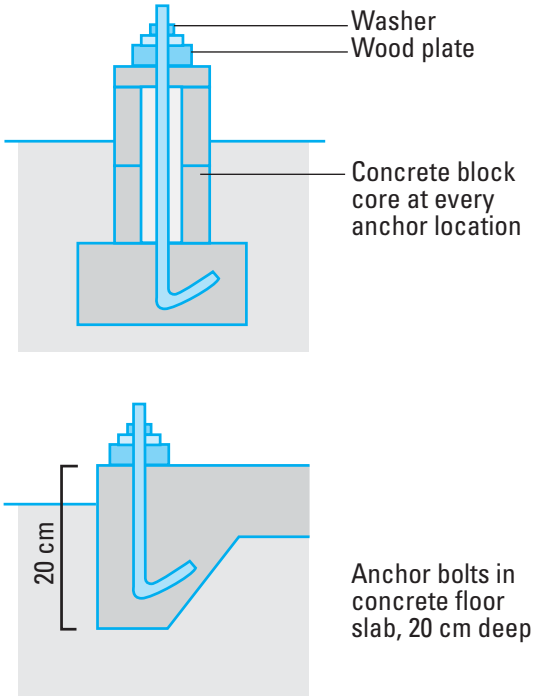
Land conditions (such as bearing capacity, landslide risk, slope of terrain), water levels, the amount and intensity of annual rainfall and the potential impact of local winds on school structures should be carefully evaluated prior to selecting the location. A thorough study of microclimatic conditions (bioclimatic analysis) is fundamental to understanding the environment and the basis for good tropical design that addresses children's and teachers' comfort. Anti-seismic design in areas prone to earthquakes and hurricane-proof design in areas with extreme winds, tsunamis and natural disasters must also be weighed.

DIAGRAM 2A: FOOTING FOR TIMBER POST



NOTE: The softer the ground, the deeper the post should be placed to withstand wind and movement.

DIAGRAM 2B: CONCRETE FOOTING DETAILS



MOBILE SCHOOL IN NAMIBIA

The Norwegian Association of Namibia (NAMAS) runs an educational programme for the semi-nomadic Himba people in Northern Namibia. The school consists of an administrative centre and 30 mobile classroom tents. Originally, the tents were of poor quality – they were too dark and too hot, and they undermined students' and teachers' productivity. Additionally, maintenance costs were high. NAMAS replaced the old tents with Norwegian tents consisting of a heavy-duty aluminium frame and a roof and wall covering of long-lasting sun- and heat-reflecting polyester with a 25-year lifespan. The resulting structure was both child-friendly and teacher-friendly. Additionally, because these tents do not have mid poles, they can be used for permanent housing. With construction time about 3.5 hours and dismantling about an hour, the classroom can be easily transported.

3.4 ADDITIONAL ELEMENTS IN DESIGN

3.4.1 Clustering

Clustering small buildings around gathering areas can effectively create variety and levels of intimacy in learning spaces, where rooms can move from public to semi-private spaces or from group to individual spaces.

3.4.2 Dwellings

In certain settings, teachers' houses of adequate quality, function and size may be offered, depending on policy and resources. The importance of providing teacher housing should not be ignored, because it may enhance the sense of ownership and social control. Additionally, it can ensure that the teaching staff are available on school premises at all times, which is especially important during the rainy season when many roads are inaccessible in some areas.

3.4.3 Landscaping

Of the many costs of building a child-friendly school, landscaping is likely to be among the lowest, yet it has one of the greatest influences on school

STANDARDS USED IN THE SWASTHH[1] PROJECT, JHARKHAND (INDIA)

ELEMENT	STANDARD/NORM
Compound wall	The compound wall must cover the school area and be strong enough to keep out intrusions or threats (e.g., from cattle).
Toilet	Two toilets separated by gender and two urinals per 250 children.
Safe drinking water	Three litres per child per day.
Facilities for hand washing	Specific area with water and soap. Recycling water should be part of the overall design.
Play area	A clear, level area for sports that can accommodate at least one class per session. Sports equipment is recommended.
Gardens	A designated area for plants, fruits and vegetables. The harvest will be used for the midday meal. Children should participate in the maintenance and recording of vegetable yield to promote a sense of ownership.
Garbage disposal	A designated area for garbage disposal and a compost system; dustbins and brooms are needed. Children must participate in cleaning and maintaining the classroom.

[1] SWASTHH stands for School Water and Sanitation towards Health and Hygiene.

aesthetics. While most agree that 'good' landscaping is of high value, the actual design, plant selection, garden preparation and maintenance are not simple or straightforward. In India, for instance, the rebuilding period after the Gujarat emergency in 2001 was the first time that local agricultural institutions were consulted for design guidance, and the community was involved with plant stock selection, planting and maintenance. Generally, the plant stock should be local and known to the community. This is another opportunity to enhance a sense of community ownership. Creative landscaping has a relatively low cost but a high impact on the appearance of the final child-friendly school.

3.4.4 Hygiene, sanitation, water

It seems obvious that facilities for children require different dimensions than those for adults. Nevertheless, 'adult-size' designs are too often used for schools, and even where these are adapted, the changes are usually minimal. Important details are overlooked, and the fact that children have different physical abilities than adults tends to be ignored. In the design of child-friendly schools, child-sized adaptations of toilet seats, urinals, taps, doorknobs, locks and handrails are crucial. Equally important is adapting to physical abilities by considering the weight of doors and toilet covers, the strength needed to open taps and fetch water. In schools with a large age spread in the student body, separate facilities for younger children, older children and teachers are recommended. When the same facilities are used by different age groups, special provisions can be made to allow smaller children to make use of the facilities, such as a step in front of the toilet seat or an additional seat cover with a smaller hole.

Additionally, special adaptations for disabled schoolchildren must be incorporated into the design and the location of water and sanitation

facilities. Too often, the needs of children with disabilities are ignored or simply forgotten.

When dealing with hygiene, sanitation and water, it is also important that the facilities be accessible, which will encourage hygienic behaviour and reduce the spread of diseases at school. Too often being 'hygienic' is so complex, because of bad design, that many children fail to practise good hygiene. Therefore, water and sanitation facilities should be simple and easy to use.

Construction needs that will ensure ample, accessible water and sanitation capacity should be calculated not just on the basis of the total number of students, but also on other factors, such as the school timetable, ratio of girls to boys, projected growth of the school population and other developments. For instance, in early childhood centres and lower primary schools (up to age 8 or 9) sharing of toilets by boys and girls may be possible.

Natural lighting and ventilation of toilets are important for cleanliness and removal of bad odours. There should be enough light to inspect for cleanliness; therefore, the use of natural light is recommended, in combination with light colours for the interior. To ensure proper ventilation, at least two openings are needed. Young children appreciate small openings at eye level. An opening in the door allows a teacher to move the latch from the outside if a child accidentally gets locked in.

Finding the right location requires looking at different practical, *environmental and cultural aspects*. In some Islamic countries, for instance, women are not to be seen when entering a toilet. At the same time, young women are afraid of being harassed or assaulted in secluded areas. This requires balancing different considerations, setting priorities and participatory decision-making. Design can become difficult when these aspects conflict and different users have different preferences. Even a well-designed facility risks not being used if its location has been poorly considered.

3.4.5 Early childcare facilities

A key component of the continuum between child-friendly schools and local communities is linking the care of younger children who are not yet in school with these schools. When early childcare is located within or near the school, older children who are attending school can leave their younger siblings at the centre. This frees older siblings to attend school and ensures that the younger children are not brought into already overcrowded first-year classrooms. In emergencies, these centres can provide parents and siblings with an opportunity to be involved in activities outside the crisis, reducing their depression and despair. Because young children provide moments of pleasure and joy that bring back a sense of normalcy, they are a source of healing for many families.

Essential considerations in creating early childcare facilities include:

Separate facilities: Early childcare centres need not be official buildings, but should be dedicated, protected spaces. They need plenty of light and air, and should include smaller-sized toilets, a cooking space and storage for supplies and materials. They need

to be free of hazardous objects and protected from the elements.

Caregivers based on ratio and age: Supervision is critical for keeping children safe and engaged in age-appropriate activities. The ratio of children to caregiver depends on their age, the facility and the country's resources. However, there should be no more than 20 children per caregiver in the 4- to 6-year-old range, 10 per caregiver for the 2- to 3-year-old range and 4 per caregiver for infants.

Space: A childcare centre needs to be sufficiently large to give each child space to move and explore. Children in these age ranges do not have to be seated in chairs, but could instead have mats to sit on, materials to learn from and room to play on their own or in small groups. An early learning environment involves a combination of teacher-directed and child-directed activities.

Research has shown that well-functioning early childhood centres are not just scaled-down elementary schools or simply open play spaces. Early childhood centres must incorporate specific design elements to achieve a safe, enjoyable developmental and learning environment. For instance, the centres should allow from 4.5 to 5.5 square metres of space per child, with a minimum of 3.8 metres per child. A larger classroom improves programmatic flexibility, provides space so children can engage in concurrent quiet and active play, and decreases aggressive behaviour.

Classrooms need to be spatially differentiated. Activity areas can be separated by physical objects like movable partitions, open shelves, cabinets and plants; or by visual signs such as different flooring materials, wall textures or colours; or by changes in lights or ceiling or floor height. Such separate, well-defined boundaries support social interaction, encourage exploratory behaviour and prevent interruption of ongoing play. In general, the classroom should have at least four distinct activity zones:

- **Gross motor skill zone.** Toddlers and preschool-age children need space where they can dance, climb, jump and move things about. The area should be large enough to accommodate structures, such as a slide or tunnel, and open enough to allow for riding and push-and-pull toys.
- **Dramatic-play zone.** Make-believe and imagination are important for pre-kindergarteners. Providing props, such as kitchen appliances, living room furniture or a theatre area, encourages such play. While the dramatic-play zone should be adjacent to the gross motor skill zone to allow for easy movement between the two, a clear division between the spaces should be visible to promote a sense of semi-private space.
- **Arts and crafts zone.** This is the 'wet' area of the room, where children can experiment with sand, water, paint, paste and other messy materials. The arts and crafts zone should be next to a water source, such as a sink and gooseneck faucet, and have a washable floor. Good lighting is also important.
- **Quiet zone.** Young children need personal space that permits interaction with an adult caregiver and provides an area for solitary play, looking at books or simply resting. The quiet zone should have carpeting, comfortable chairs and

pillows, a low bookshelf for books and stuffed toys, and a space (out of reach of toddlers) for objects such as plants or an aquarium.

Safety: With young children, safety is a major concern. A group that includes older children (6 years old and above) needs to be carefully managed or the young children will be overshadowed and left out. Teachers and caregivers must be sure that children do not have sharp objects to play with, that there are no dangerous places nearby and that there are no contaminants in the area. Food needs to be served directly after cooking, not kept for long periods of time.

3.4.6 Emergency situations

In the past, UNICEF built schools or advocated school designs in emergency-prone areas that did not always withstand calamity: Schools often collapsed following earthquakes or floods, and those that did survive failed to provide adequate shelter. UNICEF now advocates a range of innovative designs based on 'disaster risk reduction' for child-friendly environments, while at the same time respecting existing customs and practices. In the Philippines, for instance, schools rebuilt after typhoons now have more durable design and construction elements. These schools have also been designed to provide temporary shelter for adults in an emergency, while allowing for school activities to continue at certain times of the day.

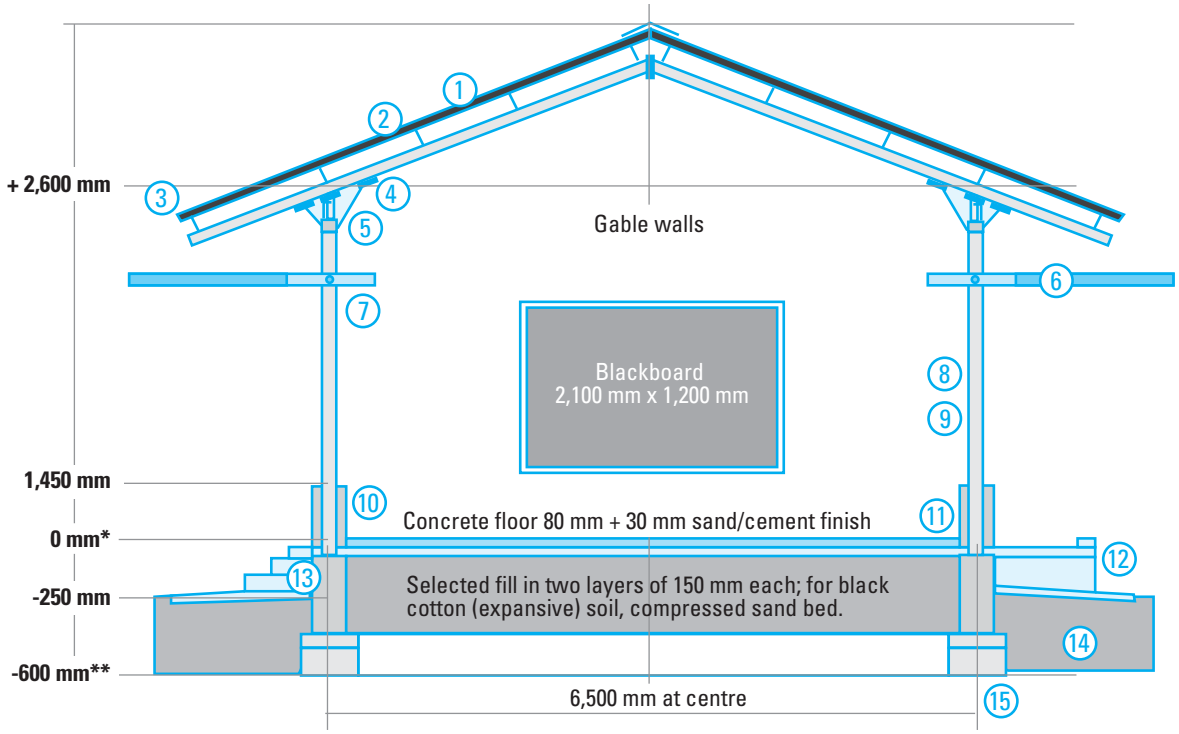
While radical innovation may be rejected by local communities or governments, lockstep adherence to existing designs that no longer work is counter to creating schools that can endure emergencies. Since UNICEF inputs are generally a small portion of the total rehabilitation and reconstruction effort, the agency should strive to offer practical, affordable and innovative designs for educational facilities that governments and communities will want to adopt on a national scale.

Schools as emergency shelters: Sometimes child-friendly schools must go beyond education, acting as shelters or gathering places during emergencies. This is particularly common in hurricane-, earthquake- and flood-prone locations. Schools are often the strongest buildings in the community, and they can be designed to accommodate multiple functions, serving as shelters and classrooms at the same time. It is crucial to understand the importance of *establishing a minimum set of standards for schools*, especially when their main educational function can be affected by other events and situations.

The dual-function model can reduce the amount of time children are forced to be out of school. Many children spend months, even years, out of school when their classrooms are being used as shelters. Regardless of whether an emergency situation exists, all designs should consider the specific emergency profile of a given locale. Some locations are flood prone, others susceptible to drought, earthquakes or hurricanes; still others have been engaged in long-term civil or military conflict. Many locations have multiple-risk profiles, and a design that is good for some conditions may be disastrous if used in the presence of others – for example, using

lightweight prefab materials made for earthquake conditions in a high-wind zone. During the process of defining the hazard profile, it is important to define these conditions in such a way that they can be fully and objectively evaluated by architects, suppliers and contractors. If the hazard profile is particularly high risk, then the designs will need to be independently evaluated for compliance with the profile. In the case of post-emergency reconstruction, construction designs should be professionally reviewed by independent, qualified institutions to confirm their safety. These evaluations

DIAGRAM 3: TYPICAL CLASSROOM CROSS SECTION



KEY:

1. Galvanized corrugated steel sheets and ridge, gauge 28.0
2. IPE 140 beam truss (slope 22 degrees) with Z-beam purlins
3. Overhang, 900 mm
4. Truss and column are bolted with M12 bolts
5. Wall plate, UPE 140
6. Steel louvre windows, 2,020x2,020 mm (including frame), pivotal at 300 mm from top
7. Light well, 600x1,900 mm, provides light when louvres are closed
8. Steel pipe, 20 mm
9. Column, steel pipe 125 mm or IPE 140 anchored to foundation
10. Stabilized block bench or fired brick with hardwood top, up to 450 mm
11. Tie beam, UPE 140
12. Ramp
13. Anti-termite barrier
14. Large stone foundation with mortar mix 1:4, or stabilized soil block up to 250 mm above field
15. Drainage, cement tile, 600x600x50 mm, with gravel, 1,200 width, 300 mm depth

* Finished floor

** Depth depends on depth of hard core

are available from numerous engineering universities. Meeting the hazard profile is an important benchmark with the government and local communities and can assure that the child-friendly school will survive the hazards it faces.

Campuses and compounds: The need for complex, integrated services for children in emergencies has given rise to new ways of thinking about security, schooling and even housing. Innovative designs, often building upon local knowledge and skills, place services for children at the centre of the community within protective circles.

In Malawi, for instance, the complex problems created by HIV and AIDS required innovative solutions. Thus, schools and recreation spaces were placed in the same compound as medical services, and housing for teachers and orphans with HIV or AIDS was situated close to the school campus. Vegetable gardens and trees were planted nearby. In the campus model, the perimeter is open. Spaces are designed to be highly visible so that community members can take responsibility for each other's security. The campus boundaries are additionally secured by fencing and a guard.

The central focus on children's return to normal routines such as schooling also encourages adults to look beyond the tragedies of the moment to the protection of their children. There is an urgent need to integrate the government's emergency preparedness with child policies. For example, child-friendly safe learning spaces can morph into child-friendly schools and child-friendly communities. Early childcare centres and nurseries can sprout within the same school grounds as the child-

MALAWI: PERMANENT SCHOOL IN MPHUNGA

Schools in Malawi are usually constructed from locally burned bricks, corrugated sheets and wooden beams supporting roofs of corrugated sheets. Such construction leads to environmental problems. The technology used for burning bricks is primitive, causing over-consumption of wood and increased deforestation. Roof beams, even if treated, are soon damaged by termites. Classrooms are too hot, with temperatures reaching 40 degrees Celsius. They are suitable neither as learning spaces for children nor as working places for teachers. Education quality is deteriorating.

UNICEF, in collaboration with Norwegian Authorities, chose an innovative technology based on the use of heavy-duty aluminium structure as a load-bearing construction for roofs and walls. Local grass was used for thatched roofs and walls were made of cement-reinforced mud blocks. Such a combination of traditional and modern materials resulted in well-functioning educational facilities, respecting the Malawian building tradition. Nine classrooms, nine dwellings for teachers, a health clinic, a doctors' office and voluntary testing centre, and kitchens for school feeding were built, as well as latrines and water points. Construction of one classroom unit of 50 square metres cost about US$4,700. The project resulted in a cool, well-ventilated and properly lit child-friendly school.

friendly school. Safe learning spaces can reduce the costs of providing the next generation with access to needed knowledge and skills.

The child-friendly strategy has been developing through local and international partnerships during emergencies over the past decade. Built on a human-rights approach that affirms the value of individual children's lives, the child-friendly approach expands existing support networks and resources for children – families, neighbours, governments and donors. It places a high value on the quality of the relationships within these social networks.

Emergency and education professionals have learned that the most important resource for the protection of children and of a nation's human infrastructure is the commitment that adults bring to the process. Parents in relocation camps are often the first to start their own schools and learning spaces to help restore a sense of normalcy, before government or international aid arrives. Aid agencies and governments can often work more rapidly and effectively if they build on local knowledge and relationships instead of importing more generic programmes packaged internationally.

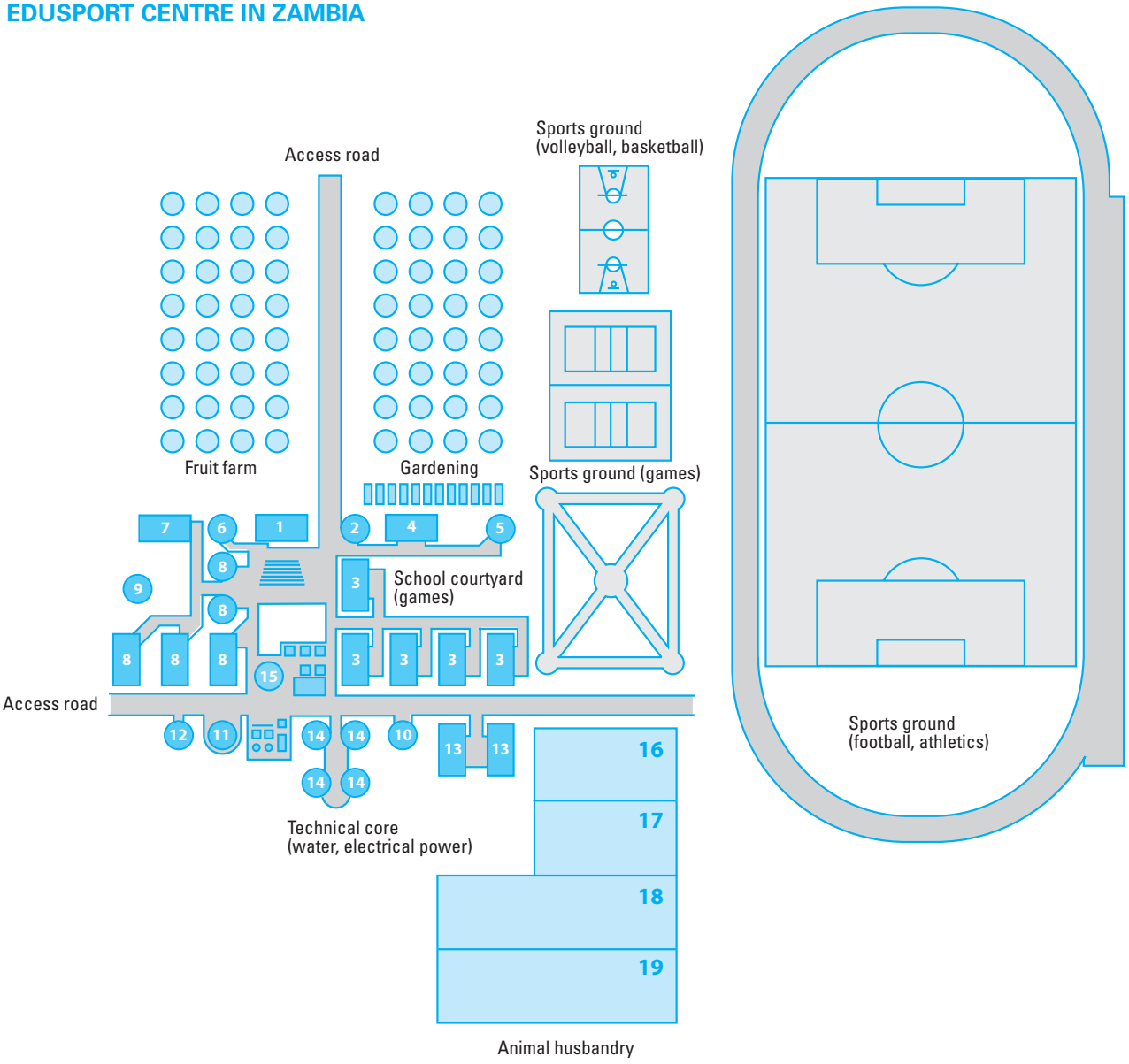
ZAMBIA: EDUSPORT SCHOOL

The Kicking AIDS Out (KAO) centre in a rural district north of Lusaka was initiated by the EduSport Foundation, a Zambian non-governmental organization, in June 2005. The EduSport Foundation promotes education through sport, especially football, as a tool through which physical activities, information and education can contribute to HIV and AIDS prevention, particularly among children and young people in rural areas.

The first stage of the KAO centre consists of four classrooms and a teacher's house, totalling 220 square metres. The centre will provide education, dormitories for orphans without relatives, management, health services with a voluntary testing centre, water and sanitation, and food and medicine storage. The innovative approach focuses on food production and skills training meant to provide not only nutrition for students, but also a source of income to cover operational costs. Sports grounds are an important part of the project. The EduSport Foundation plans to establish 10 similar centres throughout Zambia.

The local community was involved in the project and responsible for implementing its first stage. The construction took about four weeks. Local materials, such as grass for thatching and mud blocks for walls, were used. The load-bearing structures for walls and roofs are aluminium; the floors are concrete slab. The construction cost of a classroom (50 square metres) was US$4,700. The centre, to be developed in stages and in accordance with funding, is a child-friendly school model, offering safe care to orphans. The community will be responsible for the centre's operation with support from the EduSport Foundation.

DIAGRAM 4: KICKING AIDS OUT — EDUSPORT CENTRE IN ZAMBIA



KEY:

1. Management
2. Security guard technical service
3. Classrooms
4. Skills training
5. Teacher's house
6. Voluntary testing and counselling
7. Ward
8. Accommodations (students)
9. Guest house
10. Staff house
11. Sanitation (staff)
12. Medicine storage
13. Food storage
14. Sanitation (students)
15. Kitchen
16. Chicken run
17. Rabbits
18. Goats
19. Pigs

INDIA: AFTER THE EARTHQUAKE

A massive earthquake struck the Indian state of Gujarat on 26 January 2001. The earthquake registered 7.9 on the Richter scale, according to the United States Geological Survey, killing at least 17,000 people and leaving more than 700,000 homeless. Early estimates valued the total damage at approximately US$1.2 billion. More than 12,000 schools, 800 *anganwadis* (early childcare centres) and many health institutions were severely damaged.

In addition to physical and material damage, the earthquake's devastation directly affected nearly 3 million children and 2.5 million women. As many as 1,000 students were killed in the city of Bhuj alone. An estimated 200,000 children enrolled in the schools in Kutch district were affected, and nearly 800 schools were damaged. According to the Indian Office for Disasters, the situation called for community-based care for the entire region, especially for the vulnerable.

The Gujarat earthquake occurred in a region where the frequency and intensity of earthquakes were well documented (Zone V on the national and international measurement scales), as were risks for cyclonic winds up to 150 kph, drought and flash flooding. It was important to know these risks before undertaking the reconstruction process, because such risks dramatically affect design requirements and the cost and complexity of construction.

For example, many sites in the Gujarat reconstruction required high plinth construction due to flash flooding. Also, it should not be assumed that the particular emergency condition being addressed presents the most difficult design or engineering challenge: In Gujarat, the additional strength needed to comply with Zone V earthquake resistance was not as difficult or as costly as compliance with the wind-load factors required for cyclonic winds up to 150kph.

UNICEF supported the construction of the schools, using the occasion as an opportunity to demonstrate the concept of child-friendly spaces. The first buildings were designed to be cyclone and earthquake resistant, highlighting the importance of safe, secure learning environments. Equity issues were also important. Some of the new features introduced included ramps for the physically challenged, separate toilets for boys and girls, drinking-water facilities, fencing, and school furniture for students and teachers. Children were engaged in planting trees and growing school gardens wherever possible. Schools were also used to demonstrate water conservation.

All told, 169 schools, consisting of 610 classrooms, were built using child-friendly learning space designs. The new infrastructure showed a positive impact on both enrolment and attendance. The review team identified these schools as useful models to demonstrate child-friendly spaces with separate toilets for boys and girls, school gardens, play areas and potable water.

3.5.1 Gender

Just as it is in other parts of society, gender discrimination is pervasive in schools and learning spaces. In many cases, discrimination is related to cultural beliefs and traditions. Sometimes it is caused by failure to recognize problems and needs. Although it has been stated that adolescent girls drop out of school because they lack separate facilities, so far, none of these claims have been supported by studies or quantitative evidence. What has been shown is that inappropriate provisions for school hygiene, sanitation and water do affect adolescent schoolgirls' absenteeism (a first step towards dropping out of school) and their sustained interest in schooling.

3.5.2 Access for the disabled

For the approximately one in five of the world's poorest people who are disabled, access to basic services is a daily struggle. The concept of access for the disabled is often unknown in rural or poor urban school/learning space settings. Wheelchair access ramps in a child-friendly school may be the first acknowledgement of the existence of disabled children in the community and of their right to attend school. With only small adjustments (for example, a ramp) schools can be made accessible for these children. There also should be wider doors (1,000 millimetres) and adequate corridor space in which to manoeuvre a wheelchair; plinths or doorsteps obstructing entrance to classrooms and offices should be avoided. Obstructions should also be eliminated from the school grounds. The sports and extra-curricular areas, shaded outdoor lunch and learning spaces and school gardens should be made handicapped-accessible. Circulation paths and routes must be accessible to everyone, and their surfaces should be maintained regularly, especially during the rainy season. The design needs to follow established norms for accessibility while being sensitive to overall aesthetics, all of which usually adds a small amount to the final cost. Design considerations are not enough, however: Teachers and other school personnel must be reminded of their responsibilities to disabled children.

3.5.3 Climate

Analysis of the microclimatic aspects of a site will influence the design (form, shape, mass, colours, order), the orientation of buildings and the choice of building technologies, construction details and materials for the school, and the layout and organization of the learning spaces.

A study in Bam (Iran), for instance, found that its harsh bioclimatic conditions – a dry-hot zone with regular strong, dust-laden winds and temperatures reaching up to 50 degrees Celsius – called for specific design guidelines for child-friendly environments that included orienting buildings along the east-west axis, heavy external and internal walls, use of water and plants to produce humidity, utilization of north winds for air circulation and cooling in summer, and use of verandas, porches, trellises,

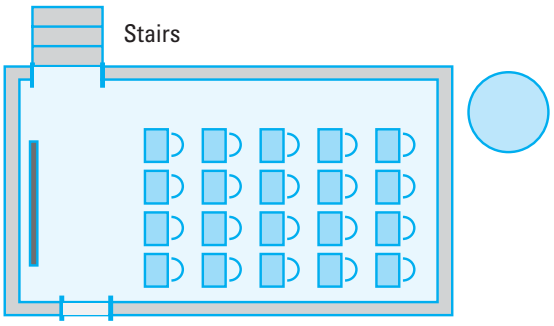
and trees to produce comfortable, shaded places for children.

3.5.4 Cost of infrastructure

Putting non-governmental organizations or village education committees in charge of school construction promotes community participation and also reduces cost. Reliance on 'community contribution of labour for construction' shifts the social cost to communities and reduces the financial outlays of donor and government. But reducing costs does not necessarily translate into good results. In Sierra Leone, for instance, the costs of a child-friendly pavilion loft classroom were extensively reduced due to the large community-input component. The cost went from around US$10,000 or US$12,000 for a conventional classroom of 54 square metres to an average of US$5,000 for the child-friendly classroom of an average 100 square metres of learning space including play/learning

DIAGRAM 5:

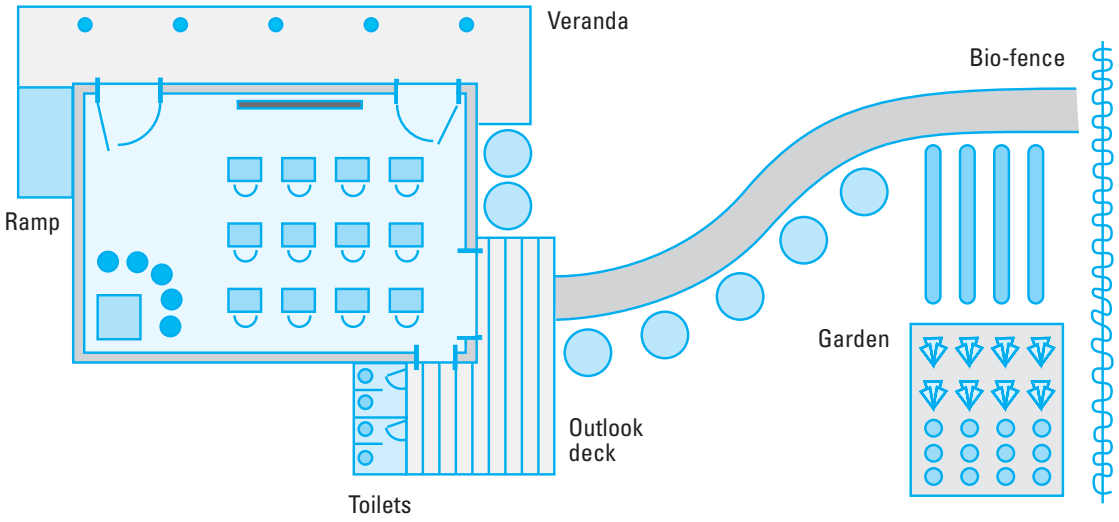
Plan 1: Existing classroom



BASIC IMPROVEMENTS

- Easy exit provided by the second door
- Better cross ventilation by adding windows and wall openings
- Deck for outdoor activities
- Garden
- Separate toilets for boys and girls
- Multi-activity classroom
- Veranda for shaded area

Plan 2: Improved classroom



GENDER-SENSITIVE SCHOOL DESIGN

Several factors need to be taken into consideration in designing schools that address girls' needs.

During menstruation, most low-income women in developing countries use cloth or rags to absorb blood, materials that can cause bad odours and are subject to leaking. In some cultures and among the very poor, women might use no means at all to absorb menstrual blood. Spending long hours at school without being able to wash properly can be an inconvenience to menstruating women and cause them embarrassment. Both schoolgirls and female teachers will opt to stay away from school on those days, resulting in absenteeism for 10 per cent to 20 per cent of school time. Consequently, girls fall behind in learning, which may very well be the first step towards dropping out.

Children begin to become aware of their development and physical changes at prepubescence (age 10 to 12). This awareness creates a need for gender-related privacy, which becomes particularly acute when toilet use and menstruation are concerned. If no privacy is provided, children will choose to look for an informal private place or wait until after school hours. In situations when they need to go to the toilet frequently, such as during episodes of diarrhoea, they prefer not to attend school rather than use facilities where others who see their 'embarrassing' condition may tease them.

decks and loft (micro-library). But the buildings were never finished – a stark reminder that shifting social cost does not necessarily reduce or eliminate the cost. It further underscores the importance of overall management. No matter how well a school is designed and built, it will not function smoothly if it is not well managed and maintained.

Planning must also adequately budget for the cost of maintenance. Once the child-friendly school is completed, its regular cleaning and maintenance can involve children. Sweeping, yard work and other chores can be part of the daily schedule and can involve even young children. When the school has active relationships with parents and other community members, many of the larger maintenance and repair tasks, such as repainting, can be done by adults with help from the children. Allocation of funds for the ongoing upkeep of the school should be decided by the democratically elected school board.

Construction budget: School construction costs should normally be determined by the basic standards for the design, labour costs and the cost of materials for the child-friendly school (Dierkx, 2003). But these cost factors can vary greatly depending on circumstances. The abundance of and access to local materials and local building skills can encourage strong community involvement if the culture of community participation is well rooted. On the other hand, the reality of poor infrastructure (roads, communication), lack of security,

absence of local building skills and materials, and a limited history of community participation may result in a monopoly for certain construction firms, especially when there is a demand for construction work by the government and the international development community. As a result, such locally 'overheated' construction markets spawn inflated prices for school construction. If this inflation exists, it may be wise to wait until the construction market has relaxed and prices have stabilized. It may also be useful to explore partnerships with non-governmental organizations and not-for-profit organizations that provide construction services.

Maintenance budget: Governments have neglected budgeting for maintenance costs in the past, resulting in the need to replace classrooms faster than their expected design life. Relying just on the community can be problematic, since the cost of effective

CASE STUDY 1

LOCATION

The location of schools or any new extensions within the school compound must be a conscious design exercise that takes into account different aspects of the basic planning process. The movement of the sun, direction of the wind, soil capacity, proximity to the seashore or riverbank, existence of a water source and questions of accessibility are just some of the important factors to be considered in designing and building a school.

The photograph shows a relatively new toilet facility at Ban Thalaenok School in the south of Thailand. The facility was designed in Bangkok without a proper site survey. There was no site visit to determine existing conditions and identify the best location for the new toilets in relation to the rest of the school. As a result, the toilets were built next to a steep staircase that leads to the canteen. They are completely inaccessible because of the grade difference.

The person in the photograph is a 41-year-old teacher trying to climb to urinals meant for 5- to 11-year-old primary students. The toilets, never used, stand as a testament to a missed opportunity to improve children's lives.

maintenance is often out of reach for many communities. When deciding on construction standards, materials' durability should be the key factor. Government budgets for classroom construction should include financing for maintenance throughout the life of the school building. However, a 'culture of maintenance' is not yet fully rooted in many nations and needs to be strengthened at all school levels. For example, cleaning and maintaining the school grounds and buildings before things break down or the grounds become inaccessible or polluted (flooding, soil-erosion, solid and fluid waste) prevents damage and the extra cost of dealing with preventable problems. This type of preventive maintenance is just as important as the periodic or scheduled maintenance over the life of a building.

CASE STUDY 2

CONSTRUCTION

In a natural disaster, victims usually deal with both the forces of nature and the damage left in their wake. Homes, hospitals and schools can be destroyed by earthquakes, tsunamis and cyclones. Therefore, school reconstruction must be guided by prevention rather than response. Reducing risk in emergencies can save hundreds, even thousands, of children. Schools that are structurally sound can also serve as shelters for the entire community.

Cyclone Nargis, which struck Myanmar in May 2008, had devastating consequences. More than 140,000 people were killed or missing. Women, especially, were the cyclone's victims, ravaging the stability of the social network.

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Many of the devastated schools showed signs of poor maintenance or of negligent supervision during their construction. Yet, in many schools, rafters, trusses and concrete foundations were found intact. These 'parts' had been built to specifications, but the interconnection of the parts was weak: Rafters were not properly connected to the brick walls with metal straps, or wood connections were done improperly. Wood posts that were not treated for humidity and water damage were rotten, further weakening the connection of the superstructure and foundation. These pictures show intact rafters blown away and badly maintained wood posts still attached to the foundation.

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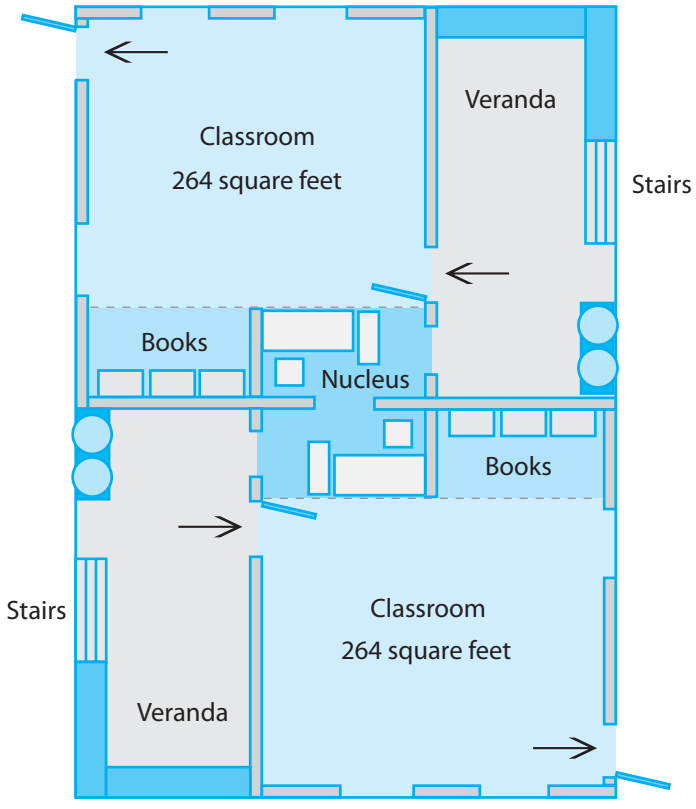
CASE STUDY 3

DESIGN

Designing a school goes beyond planning a building with four walls, windows and a door. A school must be adapted to the specific conditions of the local community and the geographical characteristics of the site; it must be concerned with the local economy and projections of demographic growth.

Primary schools in Myanmar, which have five grades, use a multigrade system within the classroom. A school may have one big classroom for all five grades and only three teachers, all conducting classes simultaneously. When building new classrooms, the challenge in Myanmar was to provide separate spaces for the students while minimizing the walking distance for teachers between classrooms. Five separate classrooms were not feasible, and one classroom was inadequate.

The new classroom design provides two separate spaces with a 'nucleus' to accommodate two teachers. (See diagram below.) For now, one teacher can supervise two grades with separate entrances and a reading corner, allowing for reduced noise levels. A primary school could have three of these structures with three teachers. If the Government increases faculty hiring, the schools would be ready to receive two more teachers and achieve the optimum ratio of one teacher per grade.



3.6.1 Users

Active involvement of users is essential in all phases of the design process. In most countries, standardized designs for schools reduce costs and control quality. Using them can be a good solution, but applying a standard design too rigidly can actually drive up costs. In general, when properly coached and guided, potential users are able to assess their existing practices and find solutions for their own needs. Their involvement during the design stage will lead to better solutions and increase acceptance of these solutions.

3.6.2 Gender needs

Besides having different physical needs than boys and men, women and girls may have different roles in society and thus different points of view and knowledge. When women and girls are not adequately involved in school planning, design, construction, operation and maintenance, their opinions and needs may not be identified and included. Girls and boys, female and male teachers, and mothers and fathers must be equally represented during decision-making activities. The school environment is a model of the community as a whole and is therefore the place where children learn about gender roles and cooperation between women and men.

3.6.3 Partners

The child-friendly school project team must meet multiple expectations, including those of the donor, partner, government counterpart, ministry of education, representatives of the construction trades and community leaders. Community expectations are likely to be the least articulated in the planning and discussions that lead to a final design. This can result in critical errors.

Consulting by convenience may overlook design needs. Child-friendly school/spaces may be built where there are no pre-existing schools or where previous schools have had restricted enrolments that have denied entry to minority subgroups. It is therefore essential for the project team to know the full complement of communities being served and, to the extent possible, address their expectations of their new school. This is a time-consuming step that is easily overlooked in the rush to show progress to donors and governments. It is a step, however, that can make the difference between community ownership with excellent outcomes and complete rejection of a costly investment.

The CFS ideal is to see that all children are equitably offered high-quality education. This cannot be accomplished simply by completing smart-looking new schools. The slow process of meeting and understanding community issues is a wise investment, one that reaps other benefits. As a school site is approaching completion, for instance, the risks of theft and vandalism dramatically increase. Providing 24-hour security to multiple remote sites is generally impossible, but if the local community has been consulted and is in agreement with the project, it may provide site protection gratis.

SCHOOLS WITH A TWIST: TAKING COMMUNITY SCHOOLS TO CHILDREN IN RURAL SIERRA LEONE

In Sierra Leone, an estimated 375,000 school-age children, mostly girls, live in poor, remote communities with no access to educational facilities. The country's brutal civil war destroyed much of the education infrastructure. Moreover, the end of the war sparked such a surge in school enrolment, especially among over age children, that there is no room for younger ones.

To address the needs of younger children who cannot walk long distances, a strategy was developed to take schools to children in their own communities over a four-year period. A partnership – composed of UNICEF; the Ministry of Education, Science and Technology; the Global Movement for Children coalition in Sierra Leone (GMC-Sierra Leone); and the communities themselves – agreed to support low-cost, child-friendly school facilities that would quickly get rural children into school.

The first phase established 410 community schools designed for grades 1 to 3. These children would then be mainstreamed into larger primary schools as they grew older and could walk longer distances.

UNICEF supported the design of an elegant facility – a simple one-classroom, integrated, multipurpose pavilion that incorporates various activities from formal learning for children and adults to community theatre. It features two activity decks and a loft that serves as an office and micro library. Once all materials are on site, it takes seven to eight weeks to construct one school at a cost of just over US$5,000. Each entity in the partnership makes a contribution: Communities provide manual labour and local materials (sand, stones and bush sticks); parents ensure that children enrol and attend school; the education ministry recruits and pays teachers; and GMC coalition members pay for skilled labour and mobilize communities. UNICEF provides the overall coordination, contributes construction materials, trains teachers and supplies educational materials.

The community school initiative is an innovative, low-cost, sustainable approach to education that makes use of a broad partnership and high-level community involvement. "This is a new thing that has come to our community," said Chief Sullay Turay, the head of Rorinka community, Bombali District. "Our little children can now attend school without waiting until they are 10 years old to be able to walk to the nearest school. Indeed, this is development."

This initiative has proved that partnerships do work and that even poor communities can be effectively engaged in developing education opportunities for their children. In post-conflict countries like Sierra Leone, taking affordable and sustainable schools to children is one step in helping the country meet its commitment to the Millennium Development Goal of having all children complete a full course of primary education by 2015.

Source: UNICEF Country Office Sierra Leone 2005 Annual Report.

3.7.1 Low cost

New materials and technologies combined with appropriate traditional technologies often are the best architectural and technical solutions for school construction given the local climate, culture and socio-economic circumstances. Technology choices made by governmental policymakers and decision makers are often based on their perception of 'what development is and what it is not'. However, they often lack knowledge of the immediate and longer-term implications of a specific 'technology package' choice. For example, a high-tech solution implies building materials and methods that are usually not found nearby and are often costly. It also implies that foreign expertise and contractors must be hired, which adds to the costs. It usually means that maintenance or 'spare parts' are not known or not easily available, and that further drives up costs. Often a blend of technologies, selected by the child-friendly school team and the ministerial school planning unit, offers the most effective solution. This blend will vary according to the country and the specific case, and will be one of the most influential factors in the final cost.

3.7.2 Multidisciplinary teams

The child-friendly schools programme must explore the formation of multidisciplinary, self-reliant teams that could be deployed on short notice and cover the whole breadth of the sector-wide education approach (SWAP). In emergency education programming, such as after a tsunami or earthquake, a three-track modality could be followed, each with a specific timeline:

1. Rapid multidisciplinary response team – short cycle, from three weeks to three months, with various experts from education, health, child protection, water and sanitation, environmental planning and community planning, as well as an economist, architect, engineer or logistics expert;
2. Midterm multidisciplinary response team – longer term, from 3 to 24 months, with experts drawn from UN agencies to enhance inter-agency cooperation;
3. Long-term implementation – after 24 months, elements of child-friendly schools that are to be sustained in post-emergency programming can be integrated into programmes.

The multidisciplinary teams ensure that planning, development and implementation of child-friendly school interventions are holistic and harmonize educational, social, cultural, economical, technological, safety, health and environmental aspects.

3.7.3 Provision of land for schools

In areas where there has never been a school, it will be difficult to obtain a centrally located plot of land that allows for the common location

of a school, early childcare centres, sport areas and a close community connection. In some cases, local governments will allocate the least desirable land for school construction. In these cases, it is imperative to obtain an environmental study of the land to determine the presence of hazardous materials.

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3.7.4 Schools in general community improvement projects

When development banks or other major financers undertake projects to improve communities, schools are often left out because they fall under the responsibility of the education ministry and other ministries are not authorized to undertake projects within the school compound. Removing these boundaries would allow schools to be part of major improvement projects that generally fall into other areas, such as water and sanitation, road improvement and electrical supply.

3.7.5 Coordination

Donor agencies and organizations should reach a common agreement on cost recovery and community participation for school construction. Questions arise, such as: Are communities required to provide unskilled labour and transportation of supplies, or will all work be subcontracted? Must the community provide the land for school construction, or must the organization buy it? Does the community arrange and pay for school toilets and water supply? These questions are relevant in all programme settings but especially in emergency situations.

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