

מבנה בית הספר הבדואי ח'אן אל-אחמר
مبنى مدرسة خان الأحمر البدوية

The Bedouin School Building
Al Khan Al Ahmar









תהליך הבנייה של בית הספר. צילום: Vento di Terra ONG, 2009.
 خلال مراحل البناء المدرسة. تصوير: Vento di Terra ONG, 2009.
 The school's building process. Photo: Vento di Terra ONG, 2009

תערוכה חדשה תיפתח במוזיאון לאדריכלות בחיפה ביום שישי ה-23.12.2016, בשעה 12:00. התערוכה שאצרו עמוס גיתאי שרון יאבו איילון וניצן סט מציגה את מבנה בית הספר הבדואי ח'אן אל-אחמר באזור מעלה אדומים, ונוגעת בממד הארכיטקטוני של עיצוב בית הספר המבוסס על בניה בצמיגים ממוחזרים ואדמה דחוסה. בית הספר הממוקם באזור גבולי, תוכנן על ידי הארגון האיטלקי Vento di Terra הפועל למען זכויות אדם ולמען איכות הסביבה. שיטת הבנייה המאפיינת את הארגון, הולכת והופכת מקובלת בעולם ליצירת מבנים קטנים, מהירי בניה, ואקולוגיים עושה שימוש בצמיגים ממוחזרים המכוסים באדמה דחוסה. עובי הקירות, מבנה הצמיג וחומרי החיפוי מייצרים מסה טרמית המתאימה לתנאי החום של המדבר ומאפשרת לימוד בתנאים נוחים. גגות המבנים כוסו בפאנלים סולריים והם מספקים את החשמל לכל המתחם. זוהי בניה מהירה יחסית ובכך יתרונה לאזורי גבול ופליטות בהם הפתרון הנדרש הוא מידי. בית הספר מתהווה משלושה מבנים מלבניים פשוטים, המסודרים סביב חצר פנימית. הוא מהווה סביבת לימודים נעימה אשר בו זמנית משתלבת בסביבתה הטבעית ומייצרת מתחם לימודי בקנה מידה אנושי.

התערוכה, תציג תמונות וקטעי וידאו שצילם הבמאי עמוס גיתאי בבית הספר כפי שהוא כיום, לצד תיעוד תהליך הבניה של בית הספר, שרטוטים אדריכליים ותיאור שיטת הבניה. בנוסף לכך, במיוחד לשם התערוכה, נעשה תהליך עבודה לימודי שהתמקד בבניה אקולוגית ובזכויות אדם, עם קבוצת תלמידים בני גילם של התלמידים הבדואים, מבית הספר היסודי זיכרון יוסף בחיפה. התלמידים החיפאים בנו בהדרכת האוצרת מודל בקנה מידה 1:50 של בית הספר הבדואי ותוך כדי כך למדו מושגים אדריכליים ואת שיטת הבניה האקולוגית באמצעות צמיגים. התערוכה מתקיימת בזכות שיתוף פעולה עם הארגון האיטלקי Vento di Terra ONG הפועל באזורי גבולות ברחבי העולם ובשיתוף עם ארגון רבנים למען זכויות אדם.

בית הספר נבנה ביוני 2009, והוא מיועד לילדי קהילת הג'האלין הבדואית. עד פתיחתו נאלצו ילדים מהאזור להגיע למוסדות חינוך מרוחקים בנסיעות שעלותן גבוהה ושהיו כרוכות בסיכון בטיחותם. כנגד בית הספר עומד צו הריסה מיום הקמתו, לטענת המנהל האזרחי בשל תכנית להרחבת הכביש הראשי הסמוך לו. מאז 2009 ועד היום ההתנחלויות כפר אדומים, אלון ונופי פרת, עותרות שוב ושוב לבג"ץ ודורשות לממש את צווי ההריסה שהוצאו לו.

הבדואים שנתרו באזור מעלה אדומים מונים כיום קרוב ל-3,000 נפש, כמחציתם ילדים. הם גרים במאהלים ובפחונים ביותר מ-20 ריכוזים לאורך כביש ירושלים-יריחו ובסמוך למעלה אדומים. רוב הקהילות הן של בני הג'האלין ועל אף שהן מתקיימות באזור זה במשך עשרות שנים, תנאי המחיה שלהן קשים ביותר: הם סובלים ממחסור חמור בשירותי בריאות, חינוך ורווחה ומהיעדר תשתיות פיזיות - חשמל, ביוב ודרכים. רק כמחצית מהקהילות מחוברות לרשת המים. הקהילות הבדואיות מנסות לקיים את אורח החיים המסורתי שלהן, המבוסס על רעיית צאן, אך גישתם לאדמות מרעה ולשווקים הולכת ומוגבלת עם חלוף השנים. המנהל האזרחי מסרב להכין עבורם תכניות מתאר באזורי מחייתם, ובכך מונע מהם אפשרות לבנות כחוק.

העתירות החוזרות של המנהל האזרחי ושל תושבי ההתנחלויות להרוס את מבנה בית הספר נדחו על ידי בג"ץ, אשר תומך בכוונת המדינה לפתור את בעיות הדיור של



בית הספר היום. צילום: עמוס גיתאי, 2016
 المدرسة اليوم. تصوير: عاموس جيتاي, ٢٠١٦
 The school today. Photograph: Amos Gitai, 2016

הבדואים במסגרת תכנית המתאר "רמת נועימה", ועד אשר זו תוסדר מבקש להשאיר את בית הספר על כנו. עם זאת, תכנית המתאר המוצעת אינה מקובלת על התושבים הבדואים אשר מעדיפים להגיע להסדרה תכנונית של מתחם המגורים שלהם במקומו הנוכחי. בשלב זה התכנית נדחתה על ידי הרשויות, אולם נציגי הקהילה ביקשו מבית המשפט לדחות את העתירה, והדגישו כי "יש לזכור כי מדובר בילדים, הלומדים בבית ספר, ואשר העברתם למסגרת לימודית אחרת, הרחוקה ממקום מושבם, אינה רצויה", וכי "נדרשת רגישות יתרה טרם מימוש צווי ההריסה נוכח ההשלכות שיש לפעולה כאמור על הקטינים".*

סיפתח מערז חדד דל מתחל ללהנדסה המעמרית דל חלפא דום דלדעה. 2016, 12, 23. השעה 12:00. דלדד המערז הדל דעה כל מן עאמוש דלדל וشارון אילון ונדלסאן סלד מלדל הדורה הדוויה דאן אחר דל מנדקה מעלה אדומלם. وهو دناول البعد الهندسي المعماري لتصميم المدرسة القائم على البناء بإطارات معاد استخدامها وتراب مضغوط. هذه المدرسة الواقعة في منطقة حدودية هي من تخطيط المنظمة الإيطالية Vento di Terra الناشطة من أجل حقوق الإنسان ومن أجل جودة البيئة. طريقة البناء التي تعتمد هذه المنظمة، آخذة بالتحوّل بشكل متزايد إلى طريقة مقبولة في العالم لإنشاء مبانٍ صغيرة، سريعة البناء، وبيئية من خلال الاستعانة بإطارات معاد استعمالها مغطاة بتراب مضغوط. سُمك الحيطان، بنية الإطار ومواد التغطية تنتج كتلة حرارية ملائمة للظروف الصحراوية وتتيح إمكانية التعلّم في ظروف مريحة. سطوح المباني غُطيت بألواح شمسية وهو توفر الكهرباء لكل المبنى. هذه الطريقة من البناء سريعة نسبياً وهنا تكمن أفضليتها في المناطق الحدودية ومناطق اللجوء التي عادة ما تتطلب حلاً سريعاً وفورياً. تتكوّن المدرسة من ثلاثة مبانٍ مستطيلة بسيطة، مرتبة حول ساحة داخلية. هذا المبنى يشكّل بيئة تعليمية لطيفة، ما يجعله يندمج في الوقت نفسه بالبيئة الطبيعية المحيطة لينتج مجعاً تعليمياً بمقاييس إنسانية.

سلددم المعرز صوراً ومقاطع فيديو صورها المخرج عاموس دلדل دل المدرسة كما هي اليوم، إلى جانب توثيق عملية بناء المدرسة، التخطيطات الهندسية ووصف طريقة البناء. بالإضافة إلى ذلك، وخصوصاً من أجل المعرز، نُقدت سيورة عمل تعليمية تمحورت حول البناء الإيكولوجي وحقوق الإنسان، مع مجموعة طلاب من أبناء سنّ الطلاب البدو، من المدرسة الابتدائية زخرون يوسلف دل حلفا. الطلاب الحلفاويون بنوا إرشاد أمينة المعرز مودللاً بمقاييس 0:1 للمدرسة البدوية وتعلموا خلال ذلك مصطلحات هندسية وطريقة البناء الإيكولوجية بواسطة الإطارات. يُجرى المعرز بفضل التعاون مع المنظمة الإيطالية Vento di Terra ONG الذي ينشط في مناطق حدودية في أنحاء العالم وبالأشتراك مع منظمة حاخامات من أجل حقوق الإنسان.

بنيت المدرسة في حزيران 2009، وهي مخصصة لأبناء عشيرة الجهالين البدوية. حتى افتتاح المدرسة كان أولاد المنطقة يتوجهون إلى مؤسسات تعليمية بعيدة وكانت السفريات باهظة الثمن وتشكل خطراً على سلامتهم. صدر ضد هذه المدرسة أمر هدم منذ يوم إنشائها، وتدعي الإدارة المدنية أن ذلك يعود إلى وجود خطة لتوسيع الشارع الرئيسي المجاور للمدرسة. منذ 2009 وحتى اليوم، تلتمس المستوطنات كفار أدميم، ألون ونوفي برات، مرة بعد أخرى، إلى المحكمة العليا وتطالبها بتطبيق أوامر الهدم التي صدرت ضدّ المدرسة.

دبلد عدد السكان العرب البدو الذين بقوا في منطقة معاليه أدميم اليوم قرابة 3,000 نسمة، ونصفيهم من الأطفال تقريباً. وهم يسكنون في خيامهم وفي بيوت من الصفيح في أكثر من 20 تجعاً على امتداد شارع القدس-أريحا وبلجوار معاليه أدميم. معظم العشائر هم من أبناء الجهالين، وعلى الرغم من أنهم يقيمون في هذه المنطقة منذ عشرات السنين، فإنّ ظروفهم المعيشية صعبة



للغاية: يعانون من نقص شديد في خدمات الصحة، التعليم والرفاه، ومن انعدام البنى التحتية الكهرباء، المجاري والطرفقات. حوالي نصف هذه العشائر موصولة بشبكة المياه. تحاول العشائر البدوية ممارسة نمط الحياة التقليدي الخاص بهم، والذي يعتمد على رعي الماشية. إلا أن إمكانية توجيههم إلى المراعي والأسواق تضيق سنة بعد أخرى. ترفض الإدارة المدنية إعداد مخططات هيكلية لمناطق سكناتهم، وبالتالي فهي تمنعهم من إمكانية البناء بشكل قانوني.

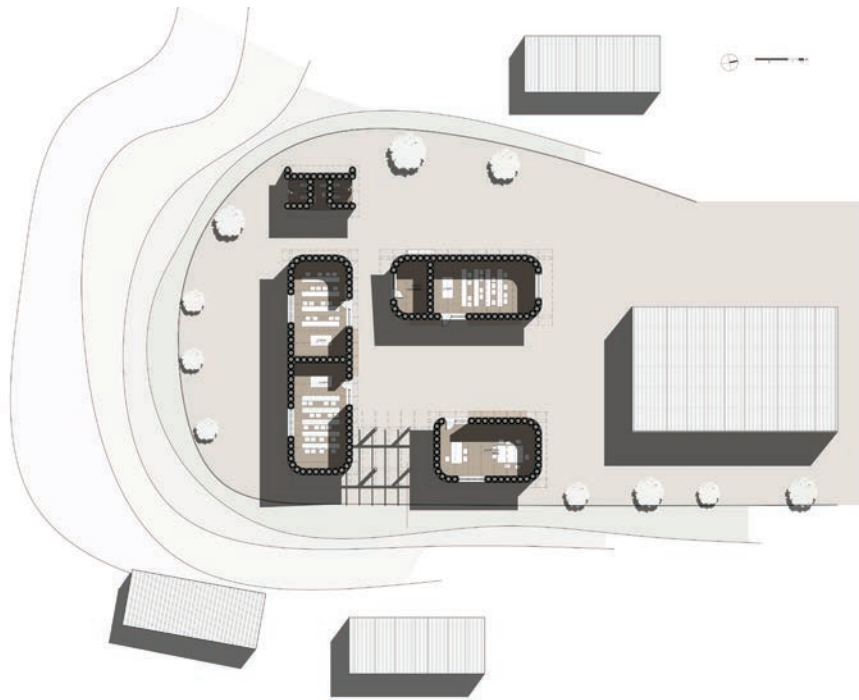
الالتماسات المتكررة التي وجهتها الإدارة المدنية والمستوطنون لهدم مبنى المدرسة رفضت من قبل المحكمة العليا، التي تؤيد نية الدولة حل مشاكل السكن لدى العرب البدو في إطار المخطط الهيكلي «رمات نعيمة». وإلى أن يتم تنظيم ذلك فالمحكمة تطلب إبقاء المدرسة على ما هي عليه. مع ذلك، المخطط الهيكلي المقترح غير مقبول على السكان العرب البدو الذين يفضلون الوصول إلى تسوية تخطيطية لمنطقة سكناتهم في مكانها الحالي. في هذه المرحلة، ترفض السلطات المخطط، إلا أن مندوبي العشيرة طلبوا من المحكمة رفض الالتماس، وأكدوا على أنه «يجب التذكّر بأن الحديث هو عن أطفال، يتعلمون في مدرسة، ونقلهم إلى إطار تعليمي آخر، بعيد عن مكان سكناتهم، هو أمر غير سهل وغير محبذ». وأن هناك «حاجة إلى حساسية زائدة قبل تنفيذ أوامر الهدم بسبب أبعاد مثل هذه الخطوة على الأطفال القاصرين كما سبق الذّكر».*



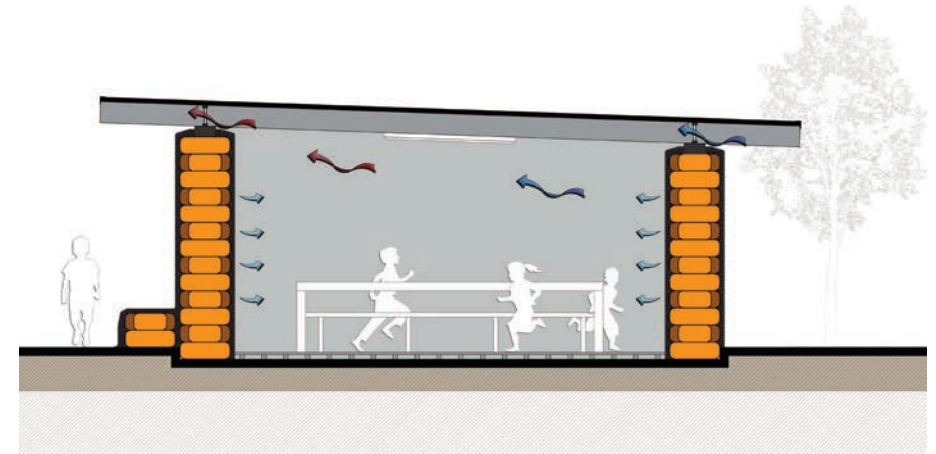
בניית הדגם על ידי תלמידי בית הספר זכרון יוסף, חיפה. צילום: שרון איילון ועמוס גיטאי
 خلال مراحل البناء المدرسة. تصوير: Vento di Terra ONG. ٢٠٠٩

The model built by the Zichron Yossef School pupils, Haifa. Photo: Sharon Ayalon and Amos Gitai

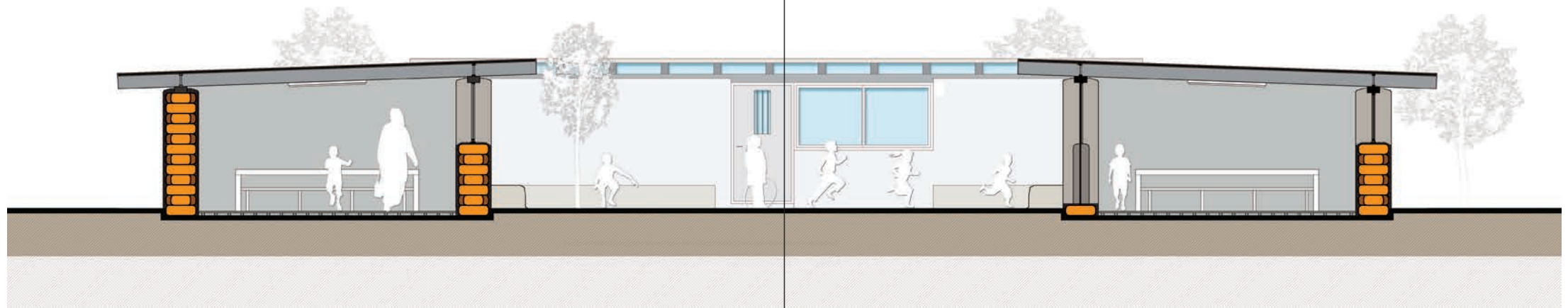
* http://m.btselem.org/hebrew/area_c/maale_adumim_bedouins



תוכנית סביבה של בית הספר. שרטוט: Vento di Terra ONG, 2009
 خلال مراحل البناء المدرسة. تصوير: Vento di Terra ONG, 2009
 Environmental plan of the school. Drawing: Vento di Terra ONG, 2009



חתך ביתת לימוד. שרטוט: Vento di Terra ONG, 2009
 خلال مراحل البناء المدرسة. تصوير: Vento di Terra ONG, 2009
 Section of a classroom. Drawing: Vento di Terra ONG, 2009



חתך דרך החצר הפנימית. שרטוט: Vento di Terra ONG, 2009
 خلال مراحل البناء المدرسة. تصوير: Vento di Terra ONG, 2009
 Section through the courtyard. Drawing: Vento di Terra ONG, 2009

stayed pending completion of a master plan for a village community near Khan al-Ahmar's current location, where the school could be rebuilt legally. In response to the petition by the settlements, the State announced in September 2012 that two alternative sites in the Jericho area – Nu'eimeh North and Armonot Hashmonaim – were being considered for relocation of the community of Khan al-Ahmar near Ma'ale Adumim, adding that the relocation would be carried out through a participatory process that would include representatives of the Jahalin, hopefully within a year. The State added that the demolition orders would not be carried out before the process was completed. In light of the State's response, the Court chose not to intervene and rejected the petitions.

In November 2013, the settlements petitioned the High Court a third time, reiterating their demand that the State carry out the demolition orders. In response, the State cited "the plan in process to relocate residents to an area north of Jericho, as part of the 'Ramat Nu'eimeh' master plan", and informed the Court that the master plan for the Armonot Hashmona'im area had been deferred for the time being. The residents of Khan al-Ahmar were determinedly opposed to relocation to the Nu'eimeh area, and submitted a plan outlining the necessary construct.*



* From: BTSELEM website: http://m.btselem.org/area_c/maale_adumim_bedouins

בניית הדגם על ידי תלמידי בית הספר זכרון יוסף, חיפה. צילום: שרון אילון ועמוס גיטאי
 خلال مراحل البناء المدرسة. تصوير: Vento di Terra ONG, 2009.
 The model built by the Zichron Yossef School pupils, Haifa. Photo: Sharon Ayalon and Amos Gitai

electricity, sewage and roads is entirely absent. Only about half of these communities are connected to the water pipelines.

Two plans, intended to reinforce the settlement bloc in the Ma'ale Adumim area and connect it with Jerusalem, threaten the Bedouins in the area. One is the EI Plan, which spans some 1,200 hectares of the jurisdictional area of Ma'ale Adumim, and area that is home to eleven of the Bedouin communities; the other is Israel's plan to erect the Separation Barrier along a route that will leave Ma'ale Adumim and the settlements around it in an enclave of some 6,400 hectares linked to Israeli territory, severing them from the West Bank. Eighteen of the Bedouin communities live in the area of the planned enclave.

In 2005, the Civil Administration prepared a plan to relocate another two hundred or so Jahalin families to the alternate site near the Abu Dis garbage dump, on the "Palestinian" side of the Separation Barrier. The plan was to build the new houses as few as 150 meters from the waste site. The plan was approved by the Civil Administration's planning authorities, but did not go into effect. In May 2012, Attorney Shlomo Lecker petitioned the High Court of Justice on behalf of Israeli human rights NGO Bimkom and some of the residents slated for displacement. The petitioners sought to have the Civil Administration rescind the evacuation, involve them in any subsequent planning concerning their future, and prevent expulsion pending a ruling on their petition. In its response, the State argued that its plan to transfer members of the tribe to an alternate site is part of the Civil Administration's overall policy regarding Bedouins in the West Bank and that it is meant "to achieve a permanent solution in accordance with the rule of law and to provide a reasonable standard of living to the rest of the tribe".

In early 2012 the State advised that the Civil Administration had conducted a risk assessment regarding the relocation of the Jahalin to a site near the garbage dump, and only when the report is complete would a decision be made regarding final approval of the plan. In the meantime, no action would be taken on the ground, and if a decision is made to move forward with the plan, it would be resubmitted for objections and the petitioners would be able to register their objections. Following this announcement, the petition was voided by agreement of the parties, emphasizing that "the authorities in the area reserve the right to continue to act with the aim of planning for the benefit of the Palestinians in general, and the Bedouin sector in particular, in all of Judea and Samaria". In early May 2013, the Civil Administration had not yet published its decision concerning the plan for relocation to the garbage dump.

In September 2012, the State announced that two alternative sites in the Jericho area – Nu'eimeh North and Armonot Hashmonaim – were being considered for relocation of Bedouins from the area of Khan al-Ahmar near Ma'ale Adumim, adding that the relocation would be carried out through a process that would include representatives of the Jahalin.

According to press reports, in May 2013, the Civil Administration approved for filing a plan for establishing a permanent community on state lands in Area C for the Bedouins of the

Nu'eimeh region. Given the location, this appears to be an implementation of the plan of which the State notified the High Court of Justice regarding the Bedouins near Ma'ale Adumim. According to the reports, the Civil Administration plans to gather into this community Bedouins from various tribes who live in different areas of the West Bank, including the area of Ma'ale Adumim, without consulting them. As of August 2013, the plan has yet to be officially published.

The Khan al-Ahmar community and school

In early 2012 the State advised that the Civil Administration had conducted a risk assessment regarding the relocation of the Jahalin to a site near the garbage dump, and only when the report is complete would a decision be made regarding final approval of the plan. In the meantime, no action would be taken on the ground, and if a decision is made to move forward with the plan, it would be resubmitted for objections and the petitioners would be able to register their objections. Following this announcement, the petition was voided by agreement of the parties, emphasizing that "the authorities in the area reserve the right to continue to act with the aim of planning for the benefit of the Palestinians in general, and the Bedouin sector in particular, in all of Judea and Samaria". In early May 2014, the Civil Administration had not yet published its decision concerning the plan for relocation to the garbage dump. Given the developments detailed below, the plan appears to have been abandoned.

One structure built without permits in Bedouin communities is a primary school in Khan al-Ahmar. Established in June 2009, the building is made of mud and rubber tires. Before the school was opened, the village children had to go schools that were far distant, making trips that were both costly and risky. A month after the school opened, the Civil Administration issued a demolition order, arguing that it was too close to a main road for which expansion plans have already been approved. Att. Shlomo Lecker filed a petition to the High Court of Justice on behalf of local Bedouins in the area, seeking that the demolition order be withdrawn. In September 2009, the settlements of Kfar Adumim, Alon and Nofei Prat petitioned the court together with Israeli organization Regavim that insists on , demanding implementation of the demolition orders issued for 257 Palestinian structures in their vicinity, including the school.

In response to the Bedouin residents' petition, the Civil Administration agreed not to demolish the school before the end of the school year in June 2010, and declared that the plans to relocate the residents would include a new school. The Court therefore denied both petitions in March 2010. The school was not demolished at the end of the 2010 school year, nor the following year either. In August 2011, the settlements petitioned the High Court once more, seeking to have the military and the Civil Administration carry out the demolition orders for the school. In November 2011, the area's Palestinian residents, represented by Att. Lecker, also re-petitioned the High Court, seeking that the demolition of the school be

Bedouins around Ma'ale Adumim

In the early 1950s, Bedouin of the Jahalin tribe were relocated from the Tal Arad (Tel Arad) area of the Negev in southern Israel to the West Bank. The displaced Bedouins contracted leases with Palestinian landowners for land in the area where the settlement of Ma'ale Adumim would later be built, and there they settled. The members of the tribe were nomadic, roaming in this area and in the Jordan Valley to graze the livestock on which their livelihood depended. After the occupation of the West Bank by Israel in 1967, the Israeli military increasingly restricted the Bedouins' access to many of the grazing grounds. Little by little, they were forced into the vicinity of the Jerusalem-Jericho road. There, until the 1980s, the Jahalin Bedouins established semi-permanent encampments, as well as at least two permanent structures.

In 1977, an Israeli laborers' camp established on land appropriated from Palestinian villages in the area was recognized as a civilian community – the settlement of Ma'ale Adumim. The settlement's boundaries, set in 1979, encompassed some 3,500 hectares; during the 1980s and 1990s, they were expanded to include another 1,300 hectares or so that Israel had declared state land. The principal part of this area comprises Area E1, where Israel plans to build additional neighborhoods to connect Ma'ale Adumim to the territory of Jerusalem.

Expulsion of the Jahalin and their life at the alternate site

The establishment of Ma'ale Adumim had a markedly deleterious effect on the members of the Jahalin tribe. As far back as the 1980s, during development work for the first neighborhoods in the settlement, Israeli authorities demolished tent encampments and at least two permanent structures in which members of the tribe lived. In 1994, the Civil Administration relocated dozens of Jahalin families from land that had been allocated to a new neighborhood in the developing settlement to a site near the Jerusalem municipal garbage dump, on Abu Dis land that Israel had declared state land.

Two further forcible expulsions of groups of Jahalin were implemented in 1997 and 1998. Further to a petition by one of the groups, an agreement was drafted between its representatives and the head of the Civil Administration, and then affirmed by the High Court of Justice. Consequently, the group moved to a site near the garbage dump (hereinafter, the alternate site), where the Civil Administration leased them plots of land gratis and granted them building permits free of fees. The Civil Administration provided a connection to water for each lot, allocated land at the site for public buildings, and paid the evacuees up to NIS 38,000 per family as "full compensation" for the relocation. This arrangement was subsequently applied to all other families that had been forcibly evacuated. Currently, approximately 190 families live at the alternate site in accordance with the conditions of this arrangement.

Life at the site involves several serious problems for its residents. It is very close to the

Abu Dis garbage dump, where approximately one ton of garbage has been trucked daily since July 2011 and more than 1,500 tons a day before that, mostly from Jerusalem. The outermost buildings of the Jahalin are located only about 300 meters from the dump, subjecting them to a terrible stench. In response to a High Court petition filed by the municipality of Maale Adumim regarding the collection of taxes for use of the garbage dump, the State explained that large accumulations of methane gas have collected at the waste site over the years, and the fires that occur there "could cause the collapse of the mountain of waste", which is liable to "cause severe environmental damage and even endanger lives." Despite these statements, Israel has made no attempt to locate another site for the village of the Jahalin. The waste collection site is by the end of 2013, but even then, gases will continue to accumulate for some twenty years after refuse is no longer being buried there, and the planned rehabilitation process will take years.

The permanent homes at the alternate site prevent the relocated Jahalin from maintaining their traditional way of life, which relies on seasonal migration and raising livestock. The area allotted to each family at the site is small and unsuitable for keeping livestock. In addition, the military limits the Jahalins' access to the land allotted them for grazing their flocks, forcing them to depend on purchasing costly fodder for the sheep. This has led many herders to sell off their livestock, and today only about 30% of the residents at the alternate site still earn a living from raising livestock. The others depend for their living on work as laborers, including in the nearby settlements. Another problem arises from that fact that although Israel has declared the alternate site state land, from the perspective of Palestinians, including the Jahalin there, the land belongs to the residents of Abu Dis, so the Jahalin are perceived as trespassers.

The threat of another expulsion

The Bedouins in the Ma'ale Adumim vicinity who were not expelled in the 1990s now number nearly 3,000, about half of them children. They live in tent encampments and sheet-metal shacks in over twenty clusters along the Jerusalem-Jericho road and near Ma'ale Adumim. Most of the communities are of the Jahalin tribe (approx. 2,700 persons), one 80-person community is of the al-Kaabneh tribe, and one 150-person community is of the a-Sawahra tribe.

These communities live under difficult conditions. Although they have lived in the area for decades, the Civil Administration refuses to prepare master plans for them, thereby denying them the possibility of legal construction. The Civil Administration issues demolition orders for buildings in Bedouin population centers, and in some cases, the orders are for all buildings in a particular community. The residents try to maintain their traditional shepherding way of life, but they have limited access to grazing land and to markets. In addition, they have few health, welfare and educational services at their disposal and physical infrastructure such as

The building technique uses recycled tyres filled with soil, which have the multiple advantage of rapid and simple realization, high standard thermal insulation and static resistance. Bibliography on this subject and the number of realized examples are still limited, but results are astonishing. Earthships are maybe the first example of building realized with this technique; they were built in New Mexico under the guide of architect Michael Reynolds. Earthships are very comfortable buildings, designed with a system of continuous water recycling, working with sustainable energy sources and bioclimatic design.

Tyre is a zero-cost material, with high elasticity and resistance, thanks to the iron and gum elements which is made of. The internal woven iron threads make tyres an ideal building material. Moreover, the re-introduction in the lifecycle is a sustainable option for a material whose destiny is usually the garbage disposal. The filling of tyres made of highly pressed soil guarantees stability and resistance to compression forces and high thermal inertia too.

Tyres fulfilled with soil are disposed in layers as big heavy bricks, and compose the bearing walls. The external lime and clay plastering protects tyres from solar radiation and avoids their decomposition and in this way any possible toxic release.

An "instruction booklet" was prepared to teach in a simple way the school building process to Jahalin Bedouins, and to leave them a fixed guide. In June 2009 the 15 days work of 10 young Bedouins and around 2200 tyres came in the realization of a school composed of 4 classrooms of 50-60 m² and a secretary office of 22 m², all surrounding the common central courtyard.

The sandwich panel roof is laid on a wooden beams structure, protecting the building from high external temperatures. A cross-air circulation system creates natural ventilation during summer season. Thermal inertia of the walls produces fresh internal temperatures in summer season and warm internal temperatures in winter season, with a difference from the outside temperature of around 10°C.

During the summer season even doors and windows were placed and the external plastering was finished with clay and lime. The children playground and a photovoltaic plant were built in August 2009.

The school was accepted in the primary school program of the Education Minister of Palestine, which sent 4 teachers and 1 headmistress: the 10th September 2009 lessons could start.

We used:

Tyres: 2200

Lime and clay plastering: 300 m²

Soil: 220 m³

Sandwich roof panels: 344 m²

Wooden pavement: 260 m²

Photovoltaic panels: 15 m²

Credits

Architectural Design: ARCò – Architettura e Cooperazione

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Promoter

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Donors:

Italian Consulate of Jerusalem – Local Technical Unit; Art Kitchen Association; Education Minister of the Palestinian National Authority; CEI – Conferenza Episcopale Italiana; Palestinian Community of Lombardia; Townships of Arluno (MI), Bresso (MI), Cesano Boscone (MI), Corsico (MI), Rozzano (MI); Namastè Association; ICHAD (Israel): Nazca Coop for Fair Trade; Sisters of Bethany – Jerusalem; Rabbis for Human Rights (Israel); Pax Christi.



בית הספר היום. צילום: עמוס גיטאי, 2016
 المدرسة اليوم. تصوير: عاموس جيتاي، ٢٠١٦
 The school today. Photo: Amos Gitai, 2016

Project team: ARCò – Architettura e Cooperazione
 Promoter: Vento di Terra NGO
 Local partner: Jerusalem Bedouin Committee
 Typology: primary school
 Project: low environmental impact building for an international cooperation project
 Users: children and teachers of Jahalin Bedouins community
 Covered surface: 350 m² – 4 classrooms, headmistress' office, teachers' room, hygienic facilities
 Realization cost: 80.000 Euro
 Place: Jahalin Bedouin village of Al Khan Al Ahmar –
 20 km east of Jerusalem, Area C, Occupied Palestinian Territory

Social and territorial context

Jahalin Bedouins are organized in 4 camps and 300 families, settled in the desert area in the North of National Route n.1, which links Jerusalem and Jericho. The area is of great strategic interest for Israeli Government, as it divides the West Bank in separated areas and crosses passages between Hebron and Jerusalem; it is classified as a C area. Al Khan Al Ahmar community is composed of 60 families, corresponding to around 600 inhabitants.

In the area there are big problems of water scarcity and pollution, due to a near chemical plant, which has been accused of low control of its atmospheric ejections.

Children situation is extremely critical, particularly for their un-respected right to education due to the fact that they had not an adequate school building into the camps, and their critical health conditions due to the poor hygienic conditions and the lack of primary medical assistance.

The Palestinian National Authority has required the presence of a proper school building to send teachers in the area, but building activity was suspended in 2007 for funds absence.

Architectural Project

The starting constraints were rather complex: the difficulties that Palestinians have indeed to obtain building permissions from the Israeli's Army was one of the reasons for choosing a non-conventional material, in order to build something that could not be defined as a permanent building. Furthermore velocity and simplicity in the construction, minimum costs and the use of local non-skilled manpower were a must. Last the project had to face the extreme climate conditions of the desert environment.

From these constraints came up an innovative project that brings together the rapid and simple construction with a high-level of comfort conditions: a school of tyres.



תהליך הבנייה של בית הספר. צילום: Vento di Terra ONG, 2009.
خلال مراحل البناء المدرسة. تصوير: Vento di Terra ONG, 2009.
The school's building process. Photo: Vento di Terra ONG, 2009

