

Basurama: a framework for designing collectively with waste

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ABSTRACT

Basurama (trash-o-rama) is a non profit organization based in Spain that has been experimenting with different approaches to waste over the last decade. It has developed a framework to create projects that provide a better understanding of waste as a resource, and raise awareness of waste production. These projects take shape in many different ways, such as workshops, public art interventions, maps or data visualizations, and work with a wide range of *stakeholders*, ranging from neighborhood communities and local artists to municipal governments.

Across all the different kinds of projects, participant-users take active part in the search, selection of waste, as well as in the collaborative process of design and construction. Through practice, participants become aware of the implications of using waste as a source material: properties, availability, and transportation. The process changes the way designers and communities approach the design project, and provides a better way to understand how to work with what already exists, be it abandoned public space or leftover materials.

Among many other activities, Basurama's practice has been centered on workshops, that last 2-4 weeks, to plan, research, design and construct. In that short period of time, Basurama's team connects with local agents to understand their needs and develop a site specific project. Local materials and techniques are used to enable the appropriation of the project by local actors and allow its replication. The proliferation of industrial waste, like car tires or pallets, allows the reproduction of these techniques across countries and certain reuse methods have been developed.

Due to the limitations of a short intervention and, in order to understand and provide this experience to others, we thought it was a good idea to analyze in detail how this process was. As a Basurama member I felt the need to extend this kind of reuse practices beyond the scope of our own projects and to conceptualize the work that had been done. These projects work both as a prototype and a 'hands on' method to train locals to build their own environments. This paper is an analysis of the 2-4 week long workshops that Basurama has been developing abroad. It will use as a case study the group of interventions in Latin America from the RUS project, specially RUS Lima (Peru).

We have found that to achieve environmentally responsible processes that reuse materials, it is fundamental to take into account the limitations and locations of materials and the qualities and possibilities of the selected space. That would be a bottom line for almost all reuse projects. However, to design and construct collectively and allow the appropriation of the project by local

agents (a community of users/citizens) they must also be included in the project since the beginning, as a fundamental variable for the long term success.

This paper establishes a foundation for a toolkit/guide for communities to be able to work collectively with their own waste, to transform their built environment, and create a better public space.

Conference Theme: System

Keywords: workshops, low cost, public space, reuse, framework

1. INTRODUCTION

“Architecture is the masterly, correct and magnificent play of masses brought together in light.”
Le Corbusier, 1923

“Architecture is the correct management of materials, place, economic resources, time and people to achieve a useful space for the people.”
Le Corbusier Revisited, 2013

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Across all the different kinds of projects, participant-users take active part in the search, selection of waste, as well as in the collaborative process of design and construction. Through practice, participants become aware of the implications of using waste as a source material: properties, availability, and transportation. The process changes the way designers and communities approach the design project, and provides a better way to understand how to work with what already exists, be it abandoned public space or leftover materials.

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Within the framework of Basurama RUS (Urban Solid Waste) methodology was developed. RUS is a public art multi-format project centered on urban waste that took shape in 10 different cities¹ between 2008 and 2010 in Latin America. Since then the project has evolved and has had new iterations in Africa and Asia.

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ENDNOTES

Miami (USA), Mexico City (Mexico), Santo Domingo (Santo Domingo), Buenos Aires, Córdoba (Argentina), Montevideo (Uruguay), Asunción (Paraguay), San Juan (Puerto Rico), Lima (Perú), San Marcos y San Pedro de Sacatepéquez (Guatemala) and the route Gira MercoRUS (Uruguay, Argentina, Paraguay).

2. RUS (URBAN SOLID WASTE) PROJECT

RUS² was a series of chained projects developed by Basurama and the local cultural-social collaborators of every iteration of the project. Every time the project ended with an action or intervention in the public space, usually degraded, and was centered in working urban waste (Basurama 2011).

The project was based on 3 pillars: *waste*, both as material resource and as a source of information to understand the consumer society; reactivation of *public space*, as a place of conflict in many cities; and the *community* of people and other stakeholders that collaborate in the project.

2.1 Waste

As mentioned before, within the framework of Basurama, and particularly in the RUS project, waste is understood both as a source of information and as a material resource that enables low cost construction. This is a key point in RUS projects, that want to serve as a prototyping process and a speed training for communities with low or none economic resources. Once the project is finished they would have developed the knowledge and the skills to construct and manage their own built environments.

RUS projects try to use the waste materials that are available in the area where the project is going to be built. Using waste materials from near places minimizes the energy cost of transportation and makes the project more related to the place. This happens in the same way that traditional architecture uses the natural materials that are available in their surroundings.

Among 'waste' architecture the term harvest map³ has been used to refer to the map where material resources are located. This research can be made available to others to show waste as a resource available for everyone. Basurama has made some harvest maps and made them publicly available online, like in the case of the Ruhr area⁴ in Germany or in the RUS Lima⁵ project.

RUS wants to show waste as something with value. Nevertheless, it is worth mentioning that in many "developing" countries waste is not only a valuable material, but has a price⁶. One of the main sources of building materials has come from waste pickers: directly involving them in the project as collaborators or buying the materials from them. The rest of the wasted materials have been bought in second hand markets, car parts shops, scrap yards and dumpsites.

2 RUS is the acronym for *Residuos Sólidos Urbanos* (Urban Solid Waste) in Spanish. The whole project was funded by the Spanish Agency for International Development Cooperation (AECID) through the Red de Centros Culturales de la Cooperación Española in Latin America.

3 Recyclicity initiative by 2012Architecten use the term harvest map. "A harvestmap can reveal: available material sources, derelict buildings and wastelands, potential energy sources (heat/cold and electricity), unused foodproduction facilities, derelict infrastructure. The map indicates geographical position, amounts, dimensions, availability and potential for each source. Accessed 16.02.13 <http://www.recyclicity.org/toolsharvestmap.html>

4 A project in collaboration with Denis Oudendijk (Refunc). A special deployment on Meipi that recognized the geoexif data of photos http://basurama.org/b10_ruhr2010.htm

5 This map, available at <http://meipi.org/playasurbanas>, displayed material resources (spaces, like urban voids or derelict buildings and construction materials) and also key stakeholders for the project. These online maps were made with the open source tool Meipi.org, a tool for collaboratively information geolocation. Mapping technologies had evolved a lot recently. Open source tools like SourceMap.com provide easy to use interfaces to evaluate the flows of materials and energy cost associated to a project. They are usually used to evaluate existing supply chains and environmental footprints, but they open a new field to locate and evaluate the inclusion of waste resources in the supply chain.

6 In Madrid or Paris it is easy to find good quality cardboard sheets, whereas in Montevideo to find the same amount and quality is not that easy. Waste might be produced at similar rates but in some places a dense network of waste pickers, apart from the official waste management systems, are picking it up continuously.

2.2 Reuse techniques and materials

Due to the ubiquity of industrial products⁷ a lot of waste materials can be found almost anywhere else. Here it is a commented list of the main techniques and materials used in RUS projects:

Car Tires

Car tires had been used for playgrounds since decades: once they are not suitable for cars they are still very resistant and useful. Along the projects they were used in many different formats: in a straightforward way as wheels for a trolley (see Fig. 1) in Rus Mexico, or reshaped for creating different elements at a public playground in RUS Lima (see Fig. 2). The tire can be cut with a simple knife and separated in three pieces: the two rings, which are the strongest parts, can be arranged in an array form; the tire tread were used to form the seat of multiple swings.

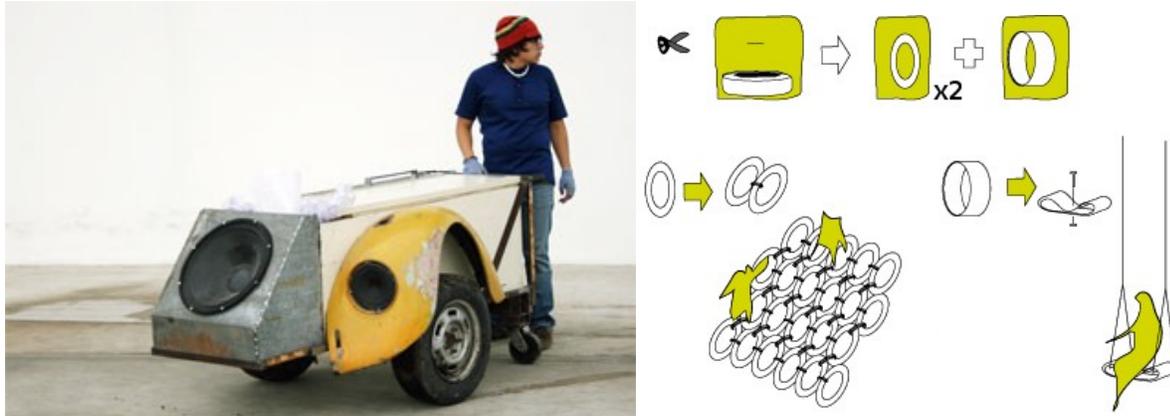


Figure 1: Portable sound system “Vocho Móvil”. Mexico. **Figure 2:** How to make a car tyre Playground. RUS Lima.

Pallets:

As a result of the transportation of goods, wooden pallets are also available almost everywhere. Although they vary in size and quality, if they are in good condition they are suitable to be used as structural pieces. They can also be disassembled and used as single planks.

The project in Asunción (Paraguay) had Sonia Carísimo and Francisco Tomboly⁸ as local collaborators. Based on previous work to build freestanding hexagonal structures that could be placed separately or connected into public space. Six pallets are assembled by its sides and by its middle points (see Fig. 3) with planks from existing unmounted pallets.

⁷ Due to the over-packaging, the planned obsolescence, and the increase number of goods that are transported,

⁸ The studio is called --+x- , which means, 'less is more for less' <http://tombolycarisimoarq.blogspot.com/> They had been experimenting with pallets before in the Casa Umbráculo#, where these elements were connected among them with planks from unmounted pallets forming a barrel vault about 8 meters wide. Umbráculo house is a project from the architecture studio “Laboratorio de Arquitectura” led by Javier Corvalán <http://www.laboratoriodearquitectura.com.py/indice.php?pagina=secciones&seccion=2&trabajo=17>



Figure 3: Rotary hex nut pallets in Przetwory Design Festival (Warsaw, Poland).



Figure 4: Tube structure in RUS Asunción.

There is almost no need to cut the planks, except for the reinforcement in the vertex, so they are easy and fast to assemble. The hex nuts can be connected to make a tube  or side by side . Inside these hex nuts different type of urban furniture or swings can be installed. This kind of intervention was suitable for a place like the semi-abandoned harbour “Playa de Montevideo” in Asunción, Paraguay (see Fig. 4).

Cardboard:

Corrugated cardboard boxes are also a ubiquitous material as all kind of goods are packaged in cardboard. This material is specially suitable for light structures that do not need to last. It was used for 4 temporary interventions (see Fig. 5) in different points of the city at the RUS Buenos Aires project. Cardboard was used to show the value of the material and to talk about the role of the ‘*cartonero*’ (waste picker that collects cardboard).



Figure 5: Light temporary structures in Plaza de Mayo, Buenos Aires. **Figure 6:** Basurama edited together with the publisher cooperative Eloísa Cartonera the guide about how to form a waste picker cooperative “Cartón y Más”.

PET plastic bottles:

In RUS Córdoba (Argentina) Basurama collaborated with the architecture studio Quinoa⁹, that had a project that connected the traditional palm weavers with waste picker cooperatives to train them how to knit with PET¹⁰. To make 5-10 meter long strings they cut PET bottles with a simple machine that included an axis and a razor. Different cooperatives¹¹ of waste pickers were able to weave and sell all kind of products. For RUS Córdoba they knitted circles to make a public display of their work (see Fig. 7) and a public workshop.



Figure 7: Weaved plastic circles with PET string from cut PET bottles. Córdoba, Argentina 2009.

2.3 Public space

The name of the project, ‘Urban Solid Waste’, makes reference to waste in its broadest sense: solid and spatial waste. In many cities in Latin America, and many other places around the world, public space is in danger/threaten. Its inadequate or poor maintenance and the privatization of public space can cause a lack of use and abandonment. In some cases this space is treated as a wasted resource. In some of the RUS projects, the recovery of this wasted public space is the main component of the intervention. This is the case of Santo Domingo (Dominican Republic),

9 Quinoa Arquitectura <http://quinuar.blogspot.com/>

10 Polyethylene terephthalate.

11 Knitters from waste picker cooperatives: "Los Carreros" from Villa Urquiza and another one from Ciudad Juan Pablo II.

where the action was centered in the degraded promenade (*malecón*) beside the sea, or the abandoned railway infrastructure in Lima.

In this sense RUS projects try to address a particular urban problem and make it through an intervention in public space: abandoned infrastructures, the misvalued role of waste pickers in the city or the car domination.

2.4 Collaborators

All kind of stakeholders have collaborated in the project: municipalities, architecture schools public/private institutions, local artists, designers, collectives, neighborhood communities and advocacy groups.

City governments are involved to grant permissions, while all the others become active collaborators of the project in way or another. Basurama leads the process, while local actors can be involved in a variety of ways: from providing a punctual support the day of the action to get fully involved and take fundamental decisions. Basurama tries to make the process as horizontal as possible to make participants-users feel that the project belongs to them. Among all the local collaborators¹², usually one is the key one that guides the Basurama members¹³ through the city and provides local knowledge about production needs. It is a remunerated job.

Municipalities:

Municipal or district authorities are key players to allow official/approved/legal interventions in public space. The negotiation to get the permit involves dealing with the local laws that control public space and to convince the municipality that using waste might not be a threat to public safety. At this level access to abandoned infrastructures or waste management issues are also discussed.

Waste pickers:

Many projects reclaimed and made visible the role of the waste picker in society. In Mexico City, Montevideo, Buenos Aires¹⁴ waste pickers were the main topic of the project and, at the same time, the providers of the material.

2.4 Timeline of a RUS project

A RUS project has a typical timeline of events grouped in three main milestones. The research trip serves to get in contact with the local people and get to know the city (people, conflicts, community, NGOs, artists, universities, etc). Back in Madrid, in Basurama's office, the documented material is organized and the conversations with the selected local agents continue. At last, in the two to four weeks of the intervention trip final negotiations with the municipality and local agents, materials final search, production.

12 Among a large list: Eloisa Ávila (designer, Mexico City), José Luis "Pyty" (local artist, Mexico City), Felipe Ridao (designer, Montevideo), or Christians Luna (local artist, Lima). The full list can be consulted at <http://basurama.org/rus/capitulo/anexo-listado-de-colaboradores/>

13 Two or three members from Basurama were involved in each of the iterations of the project.

14 In Buenos Aires Basurama collaborated with El Ceibo Cooperative and in Montevideo with the UCRUS, the waste pickers union. In Mexico City one waste picker provided and transported the material from the scrapyards that he worked for.

Steps of a RUS project

1. Research trip
 - a. Materials
 - b. Techniques and tools
 - c. Intervention spaces
 - d. Urban conflicts
 - e. Contact local agents: artists, neighbors, municipality.
2. Review information and pre-design
 - a. Establish a local main collaborator
3. Intervention trip
 - a. Production: materials, tools.
 - b. Design and co-design: iterations depending on negotiations, materials and actors
 - c. Construction: Workshop and prototype with locals
 - d. Action/intervention/installation
 - e. Unmount.

Table 1: Orientative timeline of a RUS project.

3. CASE STUDY: RUS LIMA, SELF MADE AMUSEMENT “GHOST TRAIN” PARK

The RUS Lima intervention was the recovery of an abandoned and uncompleted elevated metropolitan railway to create a public playground. It was a way to celebrate public space and also to raise awareness about the problem of waste in terms of this wasted infrastructure itself, and the implications it had on the public/private transit debate.

The “Ghost Train” Park was installed in January 2010¹⁵, functioning as the impetus for building other “do it yourself” public playgrounds in different neighborhoods. The local collaborators were able to adapt similar strategies of public space appropriation beyond the scope of the project. The project served to lower the barriers for prototyping low cost public interventions.

In April 2009, when Basurama arrived to prepare the project, during the research trip, the abandoned infrastructure seemed a suitable place to reuse and to stimulate a debate on public space, urban waste.

3.1 Wasted infrastructure, possibility of a public space

The construction of this public elevated metropolitan railway, “Tren Eléctrico” as locals call it, started in 1986; part of it was opened in 1990. Due to economic crisis and inflation it was not possible to complete the planned construction, so only about 10 kilometers of railways were built. For twenty years, the rest remained as an empty and abandoned elevated infrastructure. That’s why some people called it the “ghost train”. The place had a strong political implication as it was the ill-fated project of President Alan García (1985-1990): the promised public transportation system that had never arrived¹⁶.

After pondering different places, Basurama decided to work with this abandoned infrastructure. One of the first approaches was to open the elevated space to the public, similar to a very low cost version of the High Line¹⁷ project in New York. However, after some meetings with different municipal departments, it was clear that making the space accessible was not possible for safety and legal reasons, and also because the permit would have taken too long to arrive.

¹⁵ Two months later, the construction of the railway re-started (*Inician obras del Tren Eléctrico*. La República. March 2. 2010. <http://www.larepublica.pe/02-03-2010/inician-obras-del-tren-electrico>). In July 2011 the first stretch of the new era of the railway was opened. Although plans were underway to complete the railway prior to RUS intervention, it was unclear for citizens if that was going to happen after more than two decades of abandonment.

¹⁶ Alan García was president again from 2006 to 2011.

¹⁷ The High Line was a project collaboration between James Corner Field Operations (Project Lead), Diller Scofidio + Renfro <http://www.thehighline.org/>

Therefore, the project shifted to plan B: the creation of an amusement park using the columns and elevated platform as a place to affix playground equipment made from used materials¹⁸. This back and forth of ideas were a very common practice in these intense periods of project development and negotiation of permits.

3.2 Waste and reuse

A harvest map of Lima⁵ was made during the research trip to locate materials, potential spaces for intervention and local agents. One of the initial approaches to the project involved using all kinds of used car parts. However, due their excessive price, only car tires and ropes were finally used for the construction. Ropes were selected as some collaborators had previous experiences with knots as well as with pulley, used to upload the tire net to the structure. The neighborhood was full of car repairing shops that provided the car tires for free.

The workshop took place in the public cultural center of the district (Surquillo). There, Basurama showed collaborators and volunteers how to work with car tires. Among them there was a group of boy scouts from the neighborhood contacted by the municipality. As an example, a group of graffiti artists, Playstationvagon, learnt the technique and built swings like the 'crazy bull' (see Fig. 8). The 'rambo' net and the flying swings (see previous Fig. 2 and explanation) were the result of trying to use all the parts of the tire and take advantage of their characteristics.



Figure 8: RUS Lima amusement park. The 'rambo' net and the 'crazy bull'.

Once finished, all the built elements were transported to the site and installed within 2 days. A scaffolding was required to access the platform above and fix all the ropes to the elevated platform. To make the intervention more attractive and visually compelling, the grey concrete columns were decorated with a bunch of poster with phosphorescent colors, typical local graphic style called *chicha*.

3.3 Collaborators

The Surquillo district municipality supported the project by allowing the intervention in the abandoned infrastructure.

Christians Luna, a local artist and performer, was the main partner of the project. He led the process with Basurama and assisted in all the production stages. He was also a key actor to connect with different local actors and communities.

Apart from official institutions, this is the list of all the collaborators that were active in the project. It gives an idea of all the different kinds of actors: Christians Luna¹⁹ (visual artist), Sandra Nakamura²⁰ (visual artist), Camila Bustamante²¹ (graphic designer), El Cartón²² (architecture students collective), C.H.O.L.O.²³ (artist collective based on the Lima suburbs that facilitated further iterations of the project), El Cartón (architecture students collective),

18 There was also a planned concert from the top of the 'bridge' that had to be cancelled.

19 <http://www.christiansluna.blogspot.com/>

20 <http://www.sandranak.blogspot.com/>

Playstationvagon (graffiti writers/urban artists), El Codo (graffiti writer/urban artist), Motivando Corazones collective (non profit organization), María Pía Raschio and Diego Alonso Rossell (artist).

3.4 Further iterations of the project

The project was unmounted unexpectedly one week after its inauguration, as it was planned to remain installed for a month. As a result of this C.H.O.L.O. and Christians Luna wanted to move the project forward and test its strategy in other locations. They found pieces of the project in a municipal dump site and took the ropes and bolts, as most of the other material had been destroyed or robbed. As Christians Luna²⁴ mentions, if the project had been more rooted in a local community around the area, and not only in local artists or groups, the unmounting process would have been eventually stopped by the neighbors.

C.H.O.L.O. had been working before in the Ventanilla district, in the Lima suburbs. One of its members thought that it might be possible to repeat the experience of the 'ghost train' there. As Luna mentions, the project could not be automatically translated to that new space and situation: there was no budget, no elevated infrastructure and the space was almost in a rural environment. To be able to develop the project successfully C.H.O.L.O. and Luna had the indispensable contact and support from Pilar, the president of the Community, that facilitated the contact with the municipality and the neighbors.

They organized series of weekend intervention that lasted one month that involved: a public call for action, the cleaning of the space, a public collection of wasted materials, a money collection to buy paint and the construction of the reused playground Nueva Esperanza. To adapt to the new situation, they used local materials available like rice sacks, pieces of used wood and sand. They tried to link the construction of this playground to the existing community works that happened every Sunday²⁵. As Luna puts it, the goal was to make the participants aware that it was not the money the barrier that stopped them from building things, but the lack of initiative.

A third iteration was built months later in another Lima suburb: Santa Gallo-Rima. Luna mentioned the need for creating a guideline to enable different communities to start their own processes and create their own playgrounds.

CONCLUSION

We have found that to achieve environmentally responsible processes that reuse materials, it is fundamental to take into account the limitations and locations of materials and the qualities and possibilities of the selected space. That would be a bottom line for almost all reuse projects. However, to design and construct collectively and allow the appropriation of the project by local agents (a community of users/citizens) they must also be included in the project since the beginning, as a fundamental variable for the long term success of the process. RUS projects might serve as igniters of ideas and network creation, but longer scope projects are needed to address deeper problems of public space construction in communities.

This paper establishes a foundation for a toolkit/guide for communities to be able to work collectively with their own waste, to transform their built environment and create a better public space. Basurama is now working in a project within a long term strategy *Autobarrios*²⁶ (self-made-neighborhoods) in Madrid.

ACKNOWLEDGEMENTS

21 The map *Lima 2427*, by Camila Bustamante, was handed out to the visitors of the installation. The map resembled an official railway map, that announced that at the speed of the infrastructure construction, it would have been finished in the year 2427. <http://www.youtube.com/user/lima2427>

22 <https://twitter.com/ElCarton>

23 <http://xxxcholoxxx.blogspot.com/>

24 Interview with Christians Luna. February 2013.

25 These community practices were usually more related to repairment than to build public space. They also used the sound system that the neighbors used to communicate news.

26 *Autobarrios* takes place in San Cristobal, a neighborhood in the suburbs of Madrid and works with many local partners associations and neighbors. More info at: <http://basurama.org/proyecto/tipo/accion/autobarrios-sancristobal>

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