

Training Session:

“INCREMENTAL HOUSING STRATEGIES TO MEET RAPID URBAN GROWTH”

Dr Reinhard Goethert, MIT Special Interest Group in Urban Settlement (SIGUS)

On Wednesday morning at the 6th Session of the UN World Urban Forum in Naples, Italy, people shyly made their way into room 12 of the 5th Pavilion as they searched for a seat on one of the eight tables arranged for the forthcoming training session on incremental housing. The head of Haiti’s Unit for Construction, Housing and Public Works, a representative of a French NGO and a PhD student from Lagos, Nigeria, assembled themselves at one table, as a professor from Trondheim University, Norway, and two NGO representatives from the Philippines at another. Experts on construction materials chatted with government officials, academic researchers, students, NGO representatives and other experienced professionals, bringing a rich and diverse expertise to the tables of working groups.

The main objectives were as follows:

- Develop awareness of incremental housing
- Understand the range of incremental options and their implications
- Become aware of basic guiding principles when going incremental
- Explore the use of ‘incremental starters’ as a development tool

The session was organized around five challenges and then supplemented with background and resource information.

Challenge # 1: Increasing population = increasing demand for housing

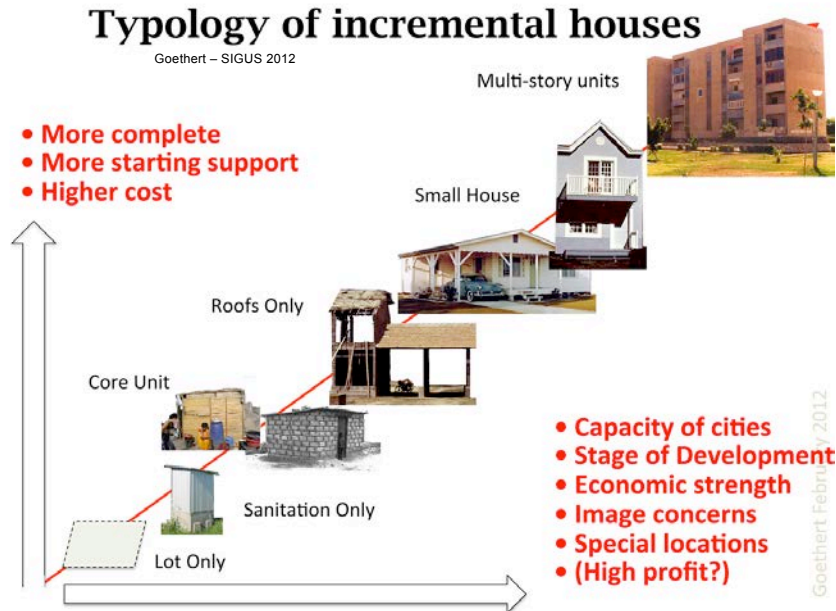
To kick off the session, participants were asked to calculate the population growth rate of their cities and to estimate the number of houses needed to be built in the next 20 years.

As numbers began to be voiced, growth rates evidenced the growing challenge for cities to supply sufficient houses and serviced land. For example, Mumbai stood out as one of the fastest growing cities, with a 4.7 percent annual growth rate in 2012, implying a doubling of the population in only 14.7 years. More generally, we are facing the challenge of building in just one generation the same amount of urban housing units that were built in the last 6,000 years.

As housing policies have failed to meet the growing demand for housing, people have turned to informal means of constructing their homes in an incremental manner over an extended period of time. Families build and expand their shelters according to their necessities and as economic resources become available. This flexible system has proven to be the best option for many and, *de facto*, the most efficient mechanism for diminishing the housing deficit and, thus, reducing potential slum conditions over the long term.

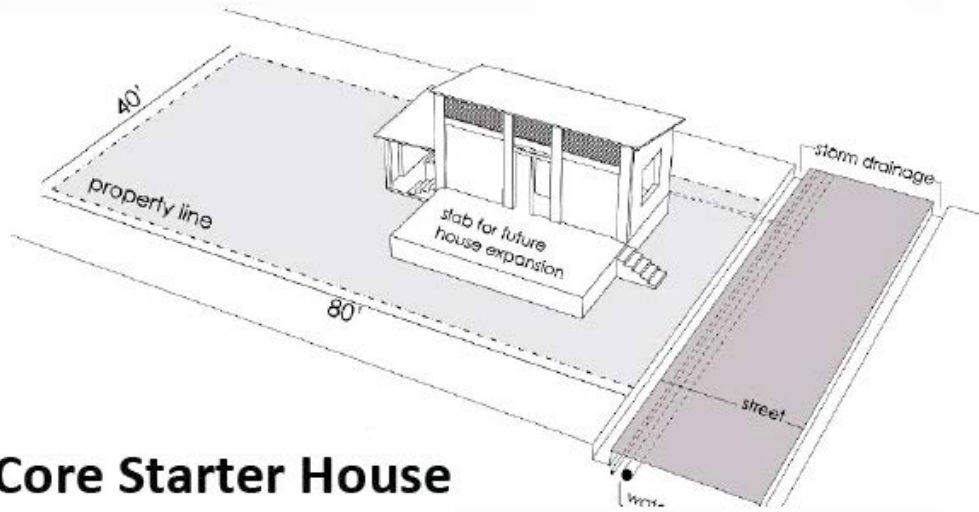
As a result, policy makers have not been blind to the benefits of this approach and have recognized that instead of controlling the informal process it is much more appropriate to accept and to partner with the energy of the informal sector in the provision of housing. Consequently,

policy makers have turned to supporting and assisting the informal sector to improve the construction and in speeding it up. Based on this concept, housing schemes increasingly aim for providing lower-income families with incremental housing options.

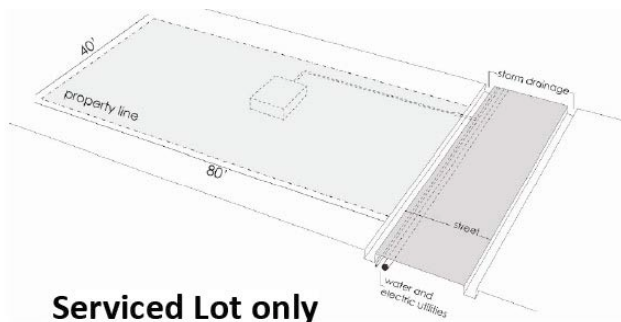


Challenge # 2: Which housing scheme for which lower income group?

The second challenge asked each group to reflect on the benefits of various policy options when designing affordable housing schemes, and to decide which option is suitable for targeting various income groups. Participants were given three sets of options that may be characterized by the resource intensity of the starter product: empty lot, basic core with utility unit and small house (ordered from low to high intensity). Then, participants were asked to determine which of the three they would offer to which income group, ranging from low income, middle low income to high low income.



Core Starter House



Serviced Lot only



Complete House

Design by George Gattoni, Drawing by Zachery Lamb

Models of affordable housing

Most of the groups chose to provide a core unit to the extremely poor, a small house to the middle low-income group and an empty lot to the higher low-income group. The policy choice is based on the assumption that the somewhat better off will prefer the individual freedom of making their own design and have the resources available to be able to build a home quickly and eventually the house they wish. On the other hand, the very poor do not have any such resources and, thus, prefer a basic shelter to start with, as the latter is ready for moving in. Otherwise, families would have to live in a low-quality transitional shelter on-site while constructing their permanent home or to pay double: the loan for the new site while still renting somewhere else.

This contradicts the conventional theory, according to which very poor people should be given an empty lot or *site and services* to build a house when they can afford. However, from experience, better targeting different income groups rivals with other policy options—such as the public resources that can be mobilized at scale and speed in order to reply to the large housing demand during rapid urbanization. As a consequence, the very poor continue to move onto land without any core housing. Yet, even though financial constraints may push policy makers in this direction, it is a waste of resources and energy if higher low-income group may be forced to live in a house that they do not like.

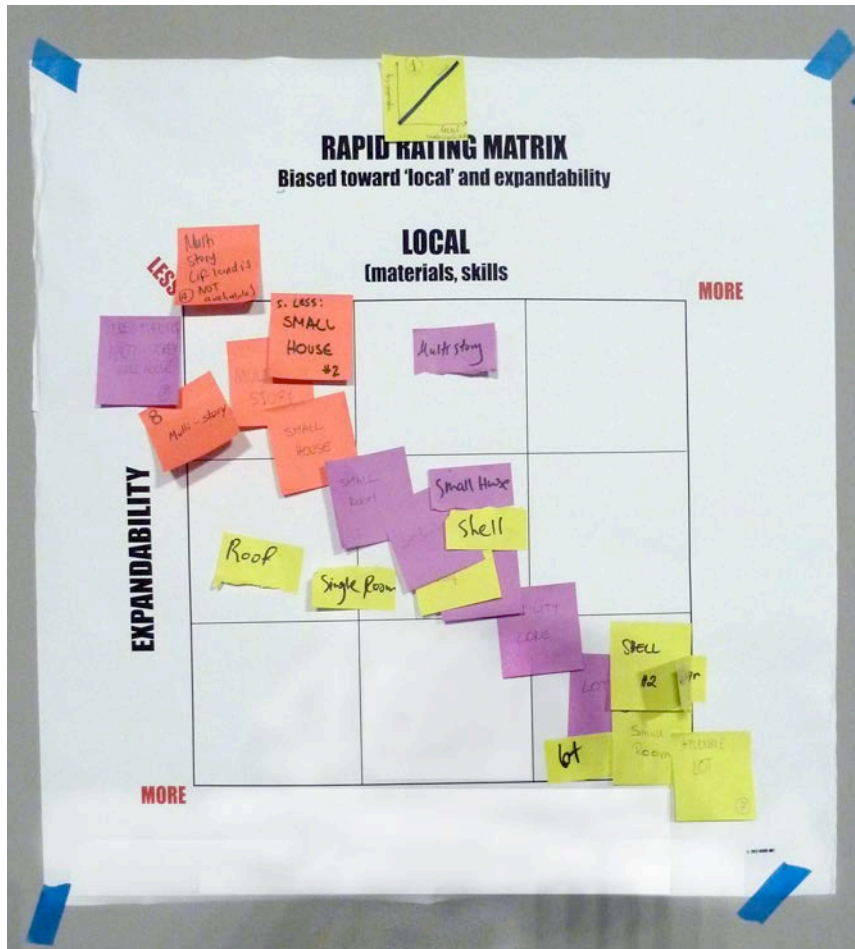
Finally, it should be mentioned that the provision of a too-small non-expandable dwelling unit is questionable as it is inflexible and does not give the inhabitants a role in the housing process. Therefore, one group even suggested: “Never give a small house!”

Keep in mind:

- Government control vs. flexibility tradeoffs:
 - More completed solutions give government more ability to control and direct the development of the house and to ensure higher livability standards. On the other hand, they are less flexible for the user, have higher initial costs and could exclude more poor. (The formal dominates)
 - Less completed solutions are harder to control and direct, they rely more on outside initiatives and are more affordable. (The informal dominates)
- Family move-in tradeoffs:
 - Less completed solutions, such as an empty lot with services, require considerable effort and investment to move in.
 - More completed solutions, for example basic core options, are ready to move in but have marginal although sufficient livability.
 - Completed solutions, for example a small house or multi-storey housing, are ready to move in but are less flexible in the future.
- Expansion tradeoffs
 - The more complete the initial provision of the housing solution the more limited it is for future expansion.

Challenge # 3: Incremental housing encourages the use of local materials?

In incremental housing accessibility to local resources, including building materials and tailored to local skills is key element. Therefore, for the third challenge participants were asked to rate different housing typologies (*sites and services*, small houses, and multi-story housing) on a matrix with two variables: flexibility and use of local materials.



Ratings of the housing typologies, depending on their flexibility and possible use of local materials, suggested by participants. Colors relate to the working groups at the tables.

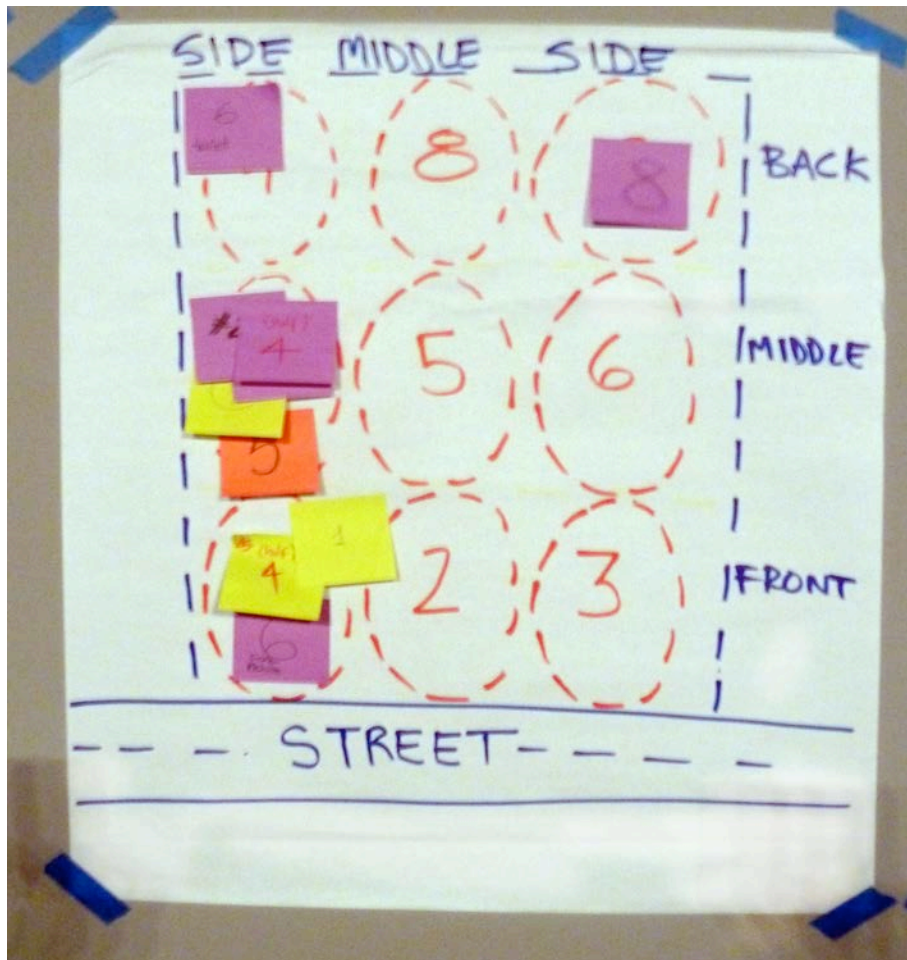
Many participants agreed that the incremental process is the most flexible option, as families are free to expand and adjust their houses depending on their needs and income. It is also more likely to use local materials and local skills, being more sustainable (e.g. as materials do not need to be imported and there is no need for training of new skills) and promoting the local economy and jobs (e.g. as the construction allows for local labor). Often in a community that has become familiar with the construction, experienced neighbours and family members build their houses in a “do it yourself” approach.

Keep in mind:

- Not all materials provide the best alternative for incremental housing.
Materials such as wood construction, cement blocks and (particularly in rural areas also) bamboo are easily used in incremental processes while shipping containers, sackcrete (earthbag) walls are not easy to remove or exchange as independent pieces. Other materials such as straw bales are not easy to maintain, as they rot away quickly.
- Nevertheless, the best building material is the one locally available and that can be built with local skills.

Challenge # 4: Ok, incremental housing, but where to place it on a lot?

The fourth challenge addressed the question of adequate plot sizes and proportions, and where on the plot should construction begin. The exercise provided a plot divided in 9 quadrants giving participants the choice of positioning the initial unit in the front of the plot facing the street, in the center of the plot or at the back of the plot. Then they had to decide whether it should be shifted towards one side of the plot or in the center.



Positions of a house on a plot suggested by different groups. Colors relate to working groups at the tables.

Regarding the position of the plot in relation to the street it is important to keep in mind:

- Having the initial construction facing the street helps to define the street and enhances a sense of community. Also, the connection to infrastructure such as electricity and water is easier to access and cheaper than extending service pipes to the back of the plot.
- However, having the core unit facing the street means that probably the toilet, sometimes being one of the first elements to be built, will end up taking the most valuable and productive space of the house.

- Regarding whether the initial unit should be towards one side or in the center, it is important to keep in mind:
- If the initial unit is more central, it provides more flexibility and options for further expansions.
- However, positioning the initial unit towards one side means that it is possible to group two initial core units of adjacent plots together allowing units to share a wall and diminish costs.

Regarding plot sizes, it is important to keep in mind:

- Small plots meet families' interests as they are more affordable and at the same time benefit the city, as it uses land more efficiently and mitigates urban sprawl.
- However, small plots are likely to be entirely covered by construction lowering adequate livability standards.

Regarding proportion of plots it is important to keep in mind:

- Narrow and long plots have proven to be the most effective when it comes to designing low income affordable housing projects, as it allows more plots to have access to the street and space in the back to expand. It minimizes the cost of infrastructure fronting the plot.
- Nevertheless, too narrow plots can risk not having naturally ventilated and illuminated spaces and may restrict the possibility of making productive spaces and multiple independent entrances from the street.

Challenge # 5: “Incrementalize” it!

By now the training event had addressed some of the main issues concerning incremental housing: the direct relation with rapid population growth; lessons learned from past decades of pilot projects with regards to the different incremental housing schemes; the implications on available local materials; and the importance of an adequate plot size and spatial arrangement of initial core units. The experience of multiple successful and failed pilot projects, planners, architects and policy makers have gained a significant amount of knowledge on the challenges and potential of incremental housing processes. In particular, it is crucial to remember that incremental building processes of houses and neighborhoods can take a very long time.

With urbanization ongoing for decades, another trend is becoming increasingly important: due to increase in land costs in consolidated urban areas, incremental housing projects are often located on the periphery or far outside of the city. However, the isolation of remote sites tends to hinder dwellers to access opportunities (especially jobs) and infrastructure from the existing city. This raises the question of whether it is possible to offer, in more consolidated areas of the city, multi-storey incremental housing projects that can ensure higher densities in a shorter amount of time and provide a more efficient use of land.

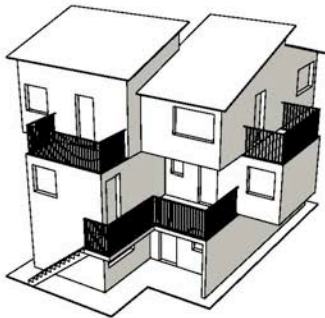
Therefore, the final exercise presented a real life case of a multi-storey affordable housing project in Manaus, Brazil. Participants were asked to imagine how dwellers had informally modified an apparently inflexible model.

RESETLEMENT PROGRAM

HOUSING TYPOLOGIES

TYOLOGY I

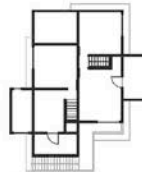
3 Family Unit
 Ground Floor Single Family
 2nd and 3rd Floor Duplex
 54 square meters per unit
 Load Bearing Masonry Structure



Ground floor



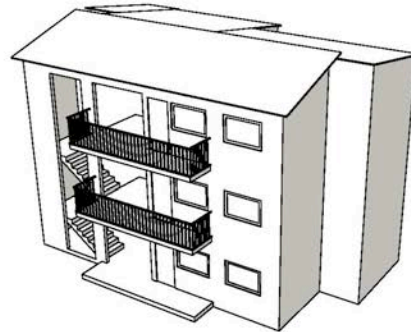
First floor



Second floor

TYOLOGY II

6 Family Unit
 Single Level Units
 46 square meters per unit
 Load Bearing Masonry Structure



Standard floor plan

Caleb Harper, Vasco Portugal, Layla Shaikley **SIGUS | MIT**

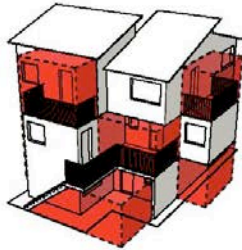
UN-HABITAT WORLD URBAN FORUM

The two types of public housing provided

Once participants had come up with various possibilities, a research group of students from the Special Interest Group in Urban Settlement (SIGUS) at MIT presented the actual expansions that inhabitants of this project had ingeniously done. In particular, balconies were closed in and incorporated into the inner house, and available ground-floor open space was quickly replaced with makeshift structures and used as small shops and stores. This clearly shows that no matter how rigid a housing project is and how much it tries to discourage modification, people will find the means to “incrementalize” it!

USER-INITIATED INCREMENTAL EXPANSION

HOUSING TYPOLOGY I

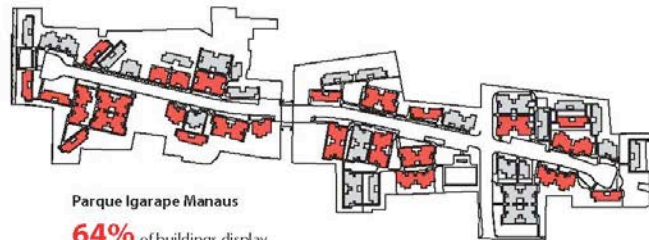


* red indicated observed locations
incremental expansion

TYPES OF EXPANSION:

62% Home-base Enterprise
26% Living Space
10% Storage

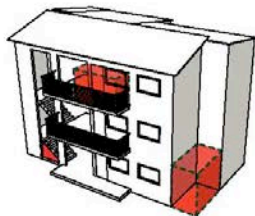
SETTLEMENT TYPOLOGY I



Parque Igarape Manaus

64% of buildings display
incremental additions

HOUSING TYPOLOGY II

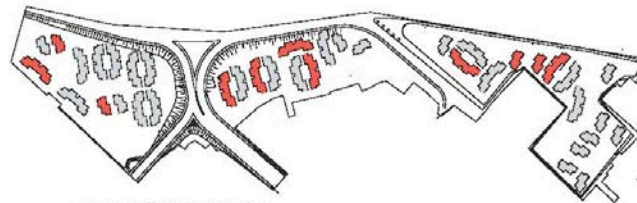


* red indicated observed locations
incremental expansion

TYPES OF EXPANSION:

38% Home-base Enterprise
41% Living Space
21% Storage

SETTLEMENT TYPOLOGY II



Parque Gilberto Mestrinho

38% of buildings display
incremental additions

Caleb Harper, Vasco Portugal, Layla Shaikley SIGUS | MIT

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Finally the SIGUS researchers presented possible alternatives to multi-storey incremental housing by offering a shell that ensured the structural safety of the building with multi-storey core units that can expand within a prefabricated structure. This planned growth not only enables an eventually denser project, allowing the pooling of land costs amongst a larger number of households and keeping costs low, but it can also ensure an adequate structural system decreasing the vulnerability of the dwellers.

Lessons:

As the world's population continues to grow at increasing speed, so does the housing deficit and the challenge for cities to efficiently meet the housing demand. The following conclusions may be drawn, when considering incremental housing as a way to address housing issues:

- By now there have been many successful and some unsuccessful projects that take into account the advantages of incremental housing and from which lessons can be learned. Nevertheless, it is essential to always evaluate and reconsider conventional theories and approaches. An example of this is the often-unsuccessful practice of providing an empty lot for the poorest of the poor or giving away inflexible completed houses.

- There is no universal recipe; everything heavily depends on location and context, especially incremental housing projects, since they develop within their socioeconomic and environmental tissue. It is crucial to always develop *flexible*, rather than rigid projects, so that people afterwards can “incrementalize” as *they* like.
- Size and proportion of plots, as well as the initial core unit’s position inside it, have a direct effect on the evolution of the incremental house and the impact on the community. The options for each of these elements have advantages and disadvantages and should be taken into consideration depending on the context.
- Incremental housing does not necessarily mean urban sprawl or houses in isolated areas. Innovative approaches, such as incremental multi-story housing, are needed in order to promote denser projects in consolidated areas of the city for a more efficient use of land.

All in all, informal sector supplying the bulk of the new housing for the poor and incremental housing has proven to be a very efficient strategy, as it caters to the needs and resources of the poor. Unfortunately, many times the construction quality of the dwellings is poor and it takes a long time for families to complete their home.

With this in mind, housing policies should support the incremental process by enabling the poor to construct their houses better and faster.

[Reviewer note: There has been much argument about how to house the ‘poorest of the poor’ who barely survive and use all their funds for food. Therefore, they have no resources left for housing so that they would not be able to expand and, thus, get stuck in whatever they receive as the starter option. In short, incremental would not work for them they say.]

Some people argue that they therefore need finished complete units. In some early projects they included blocks of rental units to address the ultra poor. However, others argue that if they are forced to pay full rent they will not be able to afford it. Alternatively, if they only pay a subsidized rent for (part of) depreciation costs, then they may as well receive a subsidized unit for which they likely care better and which is less of an administrative challenge. In order to reduce skimming off the subsidies and the ultra poor moving back to precarious conditions any such unit would arguably need to be of a low standard and/or extremely small size though, raising other ethical concerns.]