

# LEARNING FROM POST-DISASTER RECONSTRUCTION FOR PRE-DISASTER PLANNING

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## Abstract

In developing countries today, the housing crisis is aggravated by the consequences of natural disasters and armed conflicts, both of which require the construction of new housing. After natural disasters, speed is essential; to cope with the migration induced by conflicts, resettlement in safe locations is necessary.

In this paper, we compare a project in Bogotá (Colombia) where an influx of refugees can be accommodated, with a post-disaster project in Choluteca (Honduras). The risks of floods and the collapse of housing in case of an earthquake are major threats in Barrio Galan, a low-income settlement in Bogotá (Colombia) which recently benefited from a comprehensive project of urban infrastructure. Besides, a housing crisis is building up in this low-income settlement due to the continuous in-migration of rural families displaced by the ongoing, armed conflict in Colombia. An intervention in Barrio Galan is required to address an increasing housing crisis at the same time, to prepare a disaster-prevention plan.

Housing for the internally displaced population might be considered as a reconstruction project after a 'man-made' disaster. However it is one of the cases in which resettlement can hardly be avoided. Yet it is well known that resettlement (after 'natural' or 'man-made' disasters) is often accompanied by the creation of ghettos and ensuing problems in the provision of infrastructure and employment. In fact, a housing project after hurricane Mitch in Choluteca (Honduras) illustrates all the negative aspects of resettlement in the context of reconstruction. In contrast, we hypothesize that the infrastructure and services of Barrio Galan can be optimized through a re-densification and urban consolidation project in order to absorb the influx of IDP while avoiding resettlement with all its negative impacts.

*Reconstruction; urban consolidation; relocation; low-cost housing; disasters*

## INTRODUCTION

This paper is the result of the research conducted by the authors after being in contact with the ongoing debate about the search for housing solutions for the internally displaced population (IDP) in Colombia. It brings together important

aspects of the ongoing research on post disaster reconstruction at the same time that it reflects some of the discussions and hypotheses examined by the Taller Ubicar (at University Javeriana, Bogota Colombia) regarding housing for IDP. The paper is based on the notion that it is desirable to learn from previous post-disaster experiences to improve pre-disaster planning. The lessons learned from a reconstruction project in Honduras are used here to explore the way in which housing initiatives for IDP can be improved (using the case of a low-cost settlement in Bogota) and *vice versa*. Linked by the notion of resettlement (and its disadvantages) the project in Honduras and the case in Bogota are studied in parallel to draw out useful lessons.

## **BARRIO GALAN AND URBAN IN-MIGRATION**

Located in one the poorest sectors of the west valleys of Bogota, a low-income neighborhood called Barrio Galan consolidated in the last decades along the highly polluted Tunjuelito River. Even though it started as an irregular settlement of the city with the illegal and spontaneous occupation of vacant land, the neighborhood is now almost totally consolidated as a legal sector and is well integrated in the urban morphology of the city (see Fig. 1). In fact, during its lifetime, the neighborhood has been equipped with a complete infrastructure of electricity, potable water, sewage and telephone. Particularly during the last five years, Barrio Galan benefited from a systematic urban infrastructure upgrading program launched by the municipality (see Fig. 2). This program included the legalization of multiple lots, the re-identification of civic addresses and the construction of roads, sidewalks, multiple parks, urban furniture and public transportation. This infrastructure facilitates social activities and has revitalized the urban life of the neighborhood. In fact, the new parks are well equipped with playing fields and a sensible landscape for social gathering and interaction. Community services have also been completed through the construction of a school, a church and a community centre. Most of these services are the result of active lobbying and community organization lead by a local community group. Various shops, retailers and services have been spontaneously developed by the residents in their houses at the street level. These economic activities not only offer necessary services to its residents but also represent additional income to the homeowners.

Despite of the positive improvements gained by this settlement in the quality of habitat, three major threats and setbacks still exist in Barrio Galan:

- (i) High risk of floods due to the proximity of the river; (
- (ii) Risks of collapse of weak structures in the case of an earthquake; and
- (iii) Increasing housing shortage and overcrowding due to rapid and uncontrolled in-migration of IDP.



**Fig. 1.** Left. Residents of Barrio Galan work on spontaneous self-help. Right. With time, improvised shacks (like the one in the picture) are transformed into two or three storey high fully equipped houses.



**Fig. 2.** Left. Traditional typology of housing in Barrio Galan. Right. The infrastructure of roads, public services and sidewalks recently completed.

### **i. Risk of floods**

Seasonal increase of the water level of the Tunjuelito River causes dramatic floods in the sector at least once a year. The floods of 2002 and 2003 killed a number of residents and destroyed the homes and belongings of hundreds of families (El Tiempo, 2003). Even though these floods occur on a regular basis, the polluted river has not been properly channeled, representing a major source of risk for housing, public health and the environment. Obviously, the potential use of the riverside as a landscape feature and recreation is not at all optimized.

### **ii. Seismic risk**

The risk of collapse of weak housing structures: housing in Barrio Galan has been built through a spontaneous, organic and long process of self-help construction in which families complete their units over a long-time period and according to the availability of resources and in response to their needs. In fact, almost all of the houses started as small and improvised shacks made of available materials; after

some years, these units are transformed into one-storey houses of brick and concrete slabs. As materials and resources become available, the roof made of a concrete slab is transformed into the floor of a two-storey unit (see Figs. 1 and 2). This process is repeated until the house is three, and in some cases, four-stories high, keeping in the front facade successive cantilevers of 60 to 100 cm. (Barrio Taller, Especialidad, 2003). During this process of evolution, appropriate construction practices are often neglected or ignored (often due to lack of know-how). It is indeed common to find houses without a proper structure, columns on first floor that do not continue to the second floor, three and four storey units without columns, cantilevers without proper support and roof-top water tanks supported by weak structures (Fig. 3).

Despite the risks, this organic process of evolution is crucial for the sustainability of the housing process and reflects the economy of the owners. Not only does it permit the construction activities to be distributed in time following the availability of resources but it also permits the owner family to build extended houses in which very often one or two floors are rented for housing or for commerce.



**Fig. 3.** Successive cantilevers and multiple floors are built in the construction process, sometimes (like in these pictures) without the use of concrete columns.

Even when structural considerations have been included in the original design of the houses, in many cases their stability is challenged by later modifications that do not respect the original structural logic. The relatively high density of the settlement is based on a plot distribution of 6 by 20 meters, resulting in houses built with party walls side by side without space in between them. All of these characteristics emerge as causes of an increased risk of disaster in the case of an earthquake. In fact, the Western valleys of Bogota are located in an active seismic region; and previous urban earthquakes in Colombia (Armenia 1999 and Popayan 1983) demonstrate the potential urban vulnerabilities of the country.

### iii. Overcrowding

The third major threat is related with the rapid and uncontrolled migration of IDP to the West periphery of Bogota. The thirty-year armed conflict in Colombia has, in the last decade, increased the forced displacement of rural population to the periphery of major cities. As the nation's capital and a major economic engine in the country, Bogota has suffered a massive migration of displaced peasants looking for safe conditions and job opportunities (Barrio Taller, Desplazamiento, 2003). However, in reality, migrants have not found appropriate standards of living in the city. Many are unemployed and live outside the main systems of the urban life (health care, education, voting, taxation, etc.). Due to the lack of affordable housing, many opt for illegal occupation of vacant land or end up living in overcrowded conditions. This increasing phenomenon has received very little control from the national and municipal governments, resulting in high unemployment rates, higher rates of crime and an increasing housing shortage.

It is difficult to determine the scale of the problem of IDP in Colombia (Agier, 2002); however, it is estimated that there are more than 2 million displaced people. Others claim that this figure is overestimated and that it includes 'regular' migration movements from rural areas to major cities. In any case, it is agreed that there are at least eight hundred thousand (mostly rural) people displaced by increasing confrontations between leftist guerillas and extreme-right militia groups. In the case of Barrio Galan and its peripheral neighborhoods, IDP constitutes today a slow-impact housing crisis that threatens the stability of the neighborhood and the quality of life of its residents.

While the debate and the search for housing solutions for IDP in Colombia is beginning to be actively discussed at the academic and political levels, we propose here to consider the study of Barrio Galan as an exemplary case where multiple and complex variables need to be considered in a holistic way. Instead of concentrating on the traditional approach of considering housing for IDP as a 'different' problem from the regular housing crisis, we suggest that it is appropriate to analyze the habitat in an integral way that includes reducing vulnerabilities to sudden natural disasters (i.e. floods, earthquake), while controlling the long-term housing crisis due to uncontrolled in-migration.

What we are suggesting is that one can put together the lessons learnt (a) from infill approach to housing rather than the establishment of new suburban settlements, and (b) from strategies developed – hitherto independently – for coping with sudden natural disasters or with long-term population displacements.

## **THE LINK BETWEEN HOUSING FOR IDP, RECONSTRUCTION AFTER 'NATURAL' DISASTERS AND RESETTLEMENT**

Housing provision for IDP is often treated as a reconstruction project. In fact, the causes of displacement (wars and internal conflicts) are often regarded as disasters (man-made slow-impact disasters). The effects of man-made disasters are very often compared with the effects of disasters triggered by natural hazards. In fact, El-Masri and Kellet (2001) study the post-war reconstruction project in al-Burjain (Lebanon) from the perspective of traditional approaches used in post 'natural' disaster initiatives. However, at the same time, two major characteristics distinguish housing reconstruction for IDP from other post-disaster housing initiatives: first, it is one of the few cases in which resettlement can hardly be avoided, if only because the population *has* to move away from its previous location. As a result, building new housing (at least temporarily) away from their original locations is often mandatory, as affected families look to get away from the forces that are pushing them out of their villages. Second, it is difficult and sometimes impossible to determine if displaced families will remain in the new location or if they will eventually return to their original locations. If the families do return, it is also very difficult to determine when this return will occur as the end of armed conflicts is particularly difficult to predict.

However, resettlement (induced relocation), as a housing strategy after 'natural' or 'man-made' disasters, has been criticized by academics and practitioners and is considered as rarely feasible (UNDRO, 1982). According to UNDRO, induced relocation is beset by the following problems:

1. Relocation away from urban centers is largely motivated by the availability of cheap (and often undesirable) land.
2. Distances from jobs and the costs of commuting are a cause of either a reduction of income, or missed opportunities for employment.
3. Urban services are frequently missing (schools, hospitals, markets, etc.)
4. Utility systems (water, sewerage, and electricity) are often insufficient, or non-existent.
5. Few assisting groups are equipped to master-plan this type of development as part of relief management. The situation is worsened when the local authorities also lack resources and know-how.
6. If the economic and environmental situation worsens beyond endurance, people migrate back towards their original sites and jobs, leaving a vacuum behind them, quickly filled by rural-to-urban migrants, thus compounding problems of uncontrolled urbanization.

7. There are problems of default and difficulty to pay installments on time, creating, for example, problems of overcrowding (to obtain additional rent).
8. Settlements outside municipal boundaries subsist in a kind of limbo, with neither the local nor the regional authorities willing to bear the costs of development and maintenance.
9. In developing countries, urban infrastructure costs are extremely high, the per capita costs far exceeding the per capita capacity to amortize such costs. The price of serviced land has risen out of all proportion to the costs of resources and services, and especially in relation with wages (UNDRO, 1982).

In fact, re-settlements usually lack the flexibility and organic characteristics that are crucial for the sustainability of the spontaneous process from which informal settlements are created. Indeed, the following case of a project conducted after Hurricane Mitch in 1998 in Honduras is useful to analyse the effects of inappropriate planning and weak management in post-disaster resettlement. Even though the project was conducted after a 'natural' hazard, the lessons can be applied to other type of disasters such as the consequences of armed conflicts and housing for IDP.

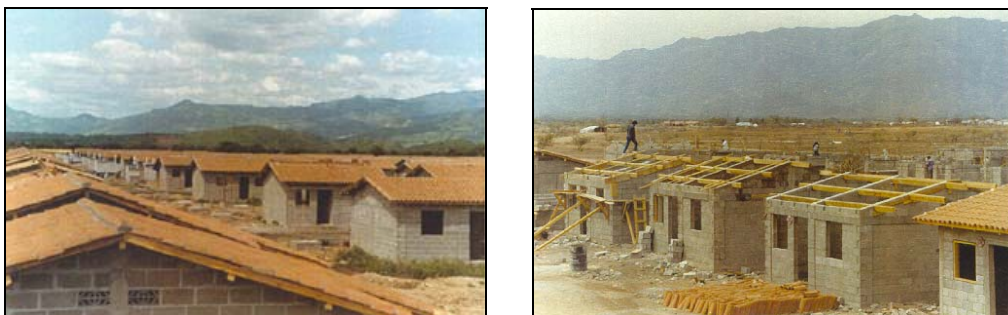
### **RESETTLEMENT PROJECT "NUEVA CHOLUTECA"**

Choluteca is an impoverished area of Honduras surrounded by no apparent economic activity. Extremely scarce agricultural production, no industry or manufacturing activities, very little new construction and an incipient tourist industry are clear signs of the dramatic poverty of the region. In fact, it is estimated that before the disaster triggered by Hurricane Mitch in 1998, only 40,8% of the potentially economic-active population was working. This figure was reduced to 32% after Mitch (Oseguera, 1999). Honduras' public debt in 1993 was greater than its Gross National Product (Atlapedia, 2003), the country was considered as highly corrupt, and despite the fact that almost 60% of the population was rural, Choluteca was a dramatic example of unequal distribution of rural land. Lack of affordable land for peasants combined with poverty has resulted in lack of housing, which leads many rural residents to occupy unsafe locations close to rivers and sources of water (for personal consumption, fishing and agricultural activities).

When the torrential rains and gale-force winds caused by Mitch washed out the country, one third of the population was badly affected, mostly the poor. Large amounts of resources were injected into the country in the first weeks after Mitch; however, these resources did not materialize as a housing reconstruction program coordinated by the national government. Within this context, more than one hundred NGOs had to assume the responsibility of housing construction (Ranganath, 2000).

The extensive damage in Choluteca and the lack of affordable safe land in the main city lead the organizations working there to believe that a resettlement plan was required. A local bank (Banco Occidental) proposed the use of one of its lots (117 hectares) in a 'safe' area 15 Kms away from Choluteca city. The land was subdivided in 2,154 individual lots without any apparent urban design, urban morphology, transportation or environmental considerations. The rough urban distribution included two principal streets of 12 meters width (exaggerated for a residential neighbourhood of one-story units) and lots of 10 by 20 meters. This rather randomly chosen distribution resulted in a spread out suburb-like plan of detached units that certainly challenged the sustainability of the project. As built, this urban configuration made construction and maintenance of infrastructure (water, sewage, electricity, drains, telephone, etc.) potentially more expensive, at the same time that it increased costs associated with the provision of other services (security, post, cleaning, waste collection, etc.) (Schoenauer, 1994).

In Nueva Choluteca, the units are setback three meters from the street and separated by 4 meters between them; even though space is available for expansion of the house, certainly the size of the plots does not allow for any agricultural or cattle raising activity. It can be said that lots are not large enough to allow the traditional exploitation of the land but neither are they well enough arranged to contribute, with a higher density, to the sustainability of the village.



**Fig. 4.** View of the units built in Nueva Choluteca. All the houses were built by the residents using a labour-intensive technology and were identical.

Individual lots were sold by the Banco Occidental to 'beneficiaries' on the basis of monthly payments of 1,701 Lempiras over 10 years (1USD\$ = 17.19 Lempiras, Dec, 2003). The housing projects lead by NGOs were built in these lots. If we consider that only 33% of the residents of Nueva Choluteca were working in 2001 (FUNDENUM-USAID, 2001) and that 80% of that 33% received less than 2,000 Lempiras per month, it is easy to understand that the housing projects were unfeasible in economic terms. However, a great number of local and international organizations got involved in this project. These included Caritas, Atlas Logistique, Iglesia de Cristo, Médecins Sans Frontieres (MSF), Organisation d'Immigration et de Migration (OIM) and the Canadian NGO CECI. This Quebec-based NGO already had experience of work in Honduras and Guatemala, and experience in reconstruction for IDP from a project conducted in Rwanda (1996-97). Consistent with the mission and objectives of the organization, a program of reconstruction was



then established by CECI for Honduras and Guatemala. This program included specific interventions in seven municipalities of Guatemala and six in Honduras. The program built a total of 2,087 houses in both countries from which about half of them were built in Honduras. The CECI's program of reconstruction at large (in Honduras and Guatemala) was funded by the Canadian International Development Agency (CIDA), The Ministry of Foreign Relations of Quebec (MRI) and several religious and private donors.

UNICEF also joined the NGOs in Nueva Choluteca to build a school. With no single leader, each organization assumed the construction of a sector. The Spanish neighborhood built by the "Cooperacion Espanola", the Samaritana neighborhood by the NGO of the same name, and so on. Even though more than 24 NGOs were working in place, none of them assumed the responsibility of building roads, water systems, electricity systems, sewage, drains, parks or sidewalks, all aspects of a reconstruction project which require overall planning and coordination. No trees, markets, urban commodities or public facilities were part of the project. The only infrastructure-related services offered in Nueva Choluteca are a small health centre, an improvised police station and two uncompleted schools.



**Fig. 5.** View of a suburb-like resettlement in Nueva Choluteca, where no roads, sidewalks, or infrastructure were completed.

Despite the fact that CECI recognized that major needs in Nueva Choluteca were related to the lack of infrastructure rather than to the construction of more and more houses (CECI, 2000) the organization got involved in the housing component of the relocation program. In partnership with the French NGO Atlas Logistique (that built a total of 250 housing units in Choluteca) and based on a self-help program, CECI started the construction of 52 units.

In Nueva Choluteca, the design of the 6 by 6 m units, without washroom and kitchen and with two 1 by 1 m windows in the facade, demonstrates little care in the detail design of the project. Walls are made of reinforced cement blocks and the roof of clay tiles (produced with local clay). Having the interior floor level elevated 15 cm from the ground, the houses are supposed to be protected from the rainy season. The costs of materials required to build one house were about US\$ 2,000 (June 2002) with a scheme to build them that involved very little user's participation in decision making. Self-help-induced activities were made by users without knowing

which house they were going to be allocated, this in order to mass produce identical units and prevent people from personalizing or putting more care in the construction of their own dwelling! The result of this scheme: a complete neighbourhood of identical units.

The later changes and additions made by users proved, three years later, that the units provided were no more than core structures and that, in reality, residents required a space for bathing, a kitchen, a washroom, and in many cases an extra room and a space for an economic or commercial activity. Not only did these additions represent extra costs for the residents but also many of them were made with poor quality materials and without proper construction and hazard-resistant standards (see Fig. 6).

Trying to overcome the limitations in infrastructure, other outputs provided by CECI in Nueva Choluteca included the construction of 118 kitchens and 172 latrines. A program of leadership and “reinforcement of democratic and participative structures” was conducted with a limited budget to which CECI added US\$ 7,000. The OIM promised US\$ 10,000 contribution to this initiative; however most of these funds came too late and therefore could not be accepted by CECI. According to a report prepared by CECI, the results of this initiative were mixed. Five meetings and work sessions were conducted with the residents, including women and local “leaders” (40% of the population of Nueva Choluteca lives in single-parent families lead by the woman).

By 2001, the figures obtained from a study conducted by FUNDEMUN-USAID showed the results of this collective failure: 4,704 people were living in Nueva Choluteca, only 42% of the houses were occupied by their owners, the rest were rented, transferred to non-owners (friends and family) or simply not used, 10% of the houses were already in irregular or bad condition. Out of the population that works (as was said before, a very low percentage) only 27% produce their income in the settlement (the majority work in agriculture and with cattle), elderly and children are forced to have non-paid jobs and a great number of crime groups of young people are reported. Crimes are frequent and the neighbourhood is considered by local residents as highly dangerous.

Obviously, the negative results of the settlement of Nueva Choluteca as a whole cannot be blamed on CECI alone nor on any other NGO. In fact, this can be considered as a case in which lack of leadership between organizations resulted in an accumulation of collective mistakes. Poor quality of housing, non existing infrastructure, increased segregation, lack of employment opportunities, high rates of crime, and public health problems characterize this new settlement and make of it a symbol of the negative consequences of badly planned induced relocation.



**Fig. 6. Top:** House as originally constructed. The fence is a later addition that many residents did on their own due to the high levels of insecurity and theft in the village. **Bottom:** later changes and additions made to the units.

Research proves that major difficulties in the construction of new low-cost housing in developing countries are associated more with the provision of infrastructure and, often in parallel, with the creation of ghettos than with the construction of housing units themselves (Bhatt, 1999). In the case of resettlement, lack of affordable land in areas located close to the sources of work (i.e. downtown or central areas) results in relocation to peripheral areas (as it was the case in Choluteca), where land is less expensive. Bringing infrastructure and services to these remote areas is usually extremely expensive and the new settlements have very little mix of use and concentrate low-income residents together, increasing the formation of ghettos and facilitating segregation between economic classes.

What can be improved in the way we deal with housing for IDP in Colombia, keeping in mind the problems often associated with resettlement and knowing that housing for displaced population can hardly avoid resettlement?

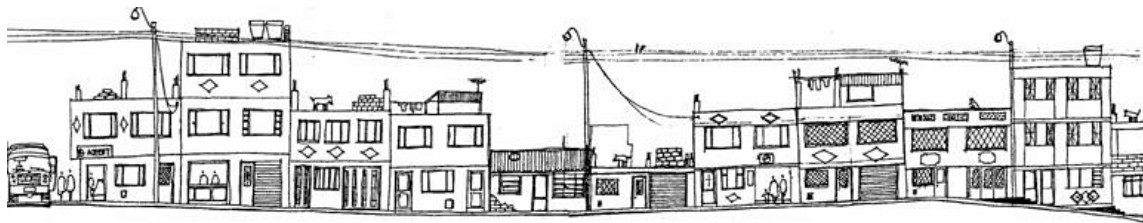
## **A DIFFERENT APPROACH TO HOUSING FOR IDP**

We propose to analyze here the problem of housing for IDP in an approach that integrates it into an existing low-income neighborhood, Barrio Galan; this approach can also, we suggest, help deal with the problems that are endemic in a low-income settlement. According to this approach, it is possible to take advantage of the organic process of the self-help provision of housing in the settlement to promote the consolidation of unfinished units with housing for IDP. In this way, it is possible

to develop reinforcement and consolidation of weak structures (incomplete structures in existing housing units) at the same time as completing unfinished units by building the second or third floors of the houses. The new space available is devoted for renting space for displaced families, representing an extra income to the owners of the units. We also hypothesize that this is a better approach than to develop (in a traditional approach to resettlement) areas outside the limits of the host city.



**Fig. 7.** The existing infrastructure of parks and public space in Barrio Galan could be optimized in a project of densification and consolidation. **Left:** a recently finished park. **Right:** The community hall.



**Fig. 8.** Typical street façade in Barrio Galan. The façade shows the potential of consolidation of unfinished houses.

In the proposed scenario, the following advantages can be exploited:

1. New rural immigrants do not get excluded from urban life in settlements exclusively for displaced families. Instead, they are absorbed into existing communities avoiding the creation of ghettos and reducing discrimination and segregation. We suggest that this might facilitate the integration of displaced families in the city and increase their capacity to enter to the regular economic and social systems.
2. In an integral project not only new housing units are built but also existing houses are consolidated and reinforced, reducing the risks of disaster in case of later earthquake.

3. Traditional typologies of construction are used in their natural form and with their normal organic and evolution processes.
4. New space for rent to IDPs represents additional sources of income for home owners and corresponds to traditional forms of the informal economy. If renting space is partially subsidized by authorities it might result in a sustainable form of housing provision.
5. The project of new housing does not require the construction of infrastructure and services from scratch. Instead, existing infrastructure and community services are optimized (maybe reinforced) for the increased density of use.
6. Densification and consolidation of existing settlements reduces urban spread, potentially reducing the destruction of agricultural land and providing obvious environmental advantages.
7. Densification and consolidation of existing settlements, instead of construction of new housing in spread-out settlements, do not challenge the sustainability of the project regarding the maintenance of infrastructure. The cost of providing services of police, fire, post, etc. is scarcely increased.

Obviously, the feasibility of this approach depends of public awareness about the importance of reducing risks and optimizing existing infrastructure and services. The role of external organizations can permit assuring financing and increasing safety in the settlement while assuming the advantages of the organic creation of housing. Much more research is still needed in this area to validate the feasibility of this approach; however, we are convinced that alternative solutions to providing housing for IDP - such as this - can avoid the negative effects of resettlement. If enough public awareness is obtained, pre-disaster planning brings a unique opportunity to consider holistic and long-term sustainable solutions while avoiding the rush and chaos of the post-disaster crisis.

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