USERS' PARTICIPATION AND SATISFACTION IN POST-DISASTER RECONSTRUCTION

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Abstract

Reconciling the objectives of the initiator of a building project with the expectations and requirements of the intended users is fundamental for the success of any project – and is particularly difficult to ensure in low-cost housing reconstruction. According to the theory of bounded rationality, project decision makers are confronted with limited information and resources, and thus, cannot achieve an *optimal* solution. They necessarily accept a *satisficing* [SIC] solution (Simon, 2004). However, users also accept a *satisficying* project outcome by balancing what is offered to them with potentially available alternatives.

Under the conditions of post-disaster reconstruction, the non-acceptability of project outcomes and users' dissatisfaction are the most frequent risks. This article reports the results of a study of a post-flood reconstruction project conducted in 2006 in a village in North Africa. It examines the relations between project stakeholders, the structure of the team (the Temporary Multi-Organisation, TMO) established to conduct the project and the most important concerns of end-users. Users' satisfaction was assessed through technology transfer indicators, based on the qualitative analysis of various interviews with end-users. The study explains *how* certain decisions related to the structure and functioning of the TMO affect the match between the project initiators' capacity to provide an adequate solution to housing needs and the users' expectations and requirements after the disaster.

Keywords: Temporary Multi-Organization; Post-disaster Reconstruction; Participation; Users' Satisfaction; Organizational design.

Introduction

This research project aims at exploring the relationship between (a) the structure of the project team established to conduct the project, and (b) the satisfaction of end-users. The document begins with an explanation of basic concepts: the TMO, the theory of bounded rationality, project risks and users' satisfaction. It then presents the research methods and the case study conducted. Finally the conclusions of the study and lessons learned are presented.

Construction projects are temporary endeavors with a defined beginning and end (PMI, 2008), conducted by a temporary and multi-disciplinary team called a Temporary Multi-Organization (Lizarralde et al., 2009; Cherns and Bryant, 1984). It is temporary because it only lasts for the duration of any one project, separating at the end and it is a multi-organization because of its multi-disciplinary composition, where each participant brings his or her specific skills (Davidson, 1988).

Actors of the TMO in the construction sector are constrained by three difficulties that affect project coordination and management: (1) The limited access to pertinent information for decision-making during project planning and development (PMI, 2008); (2) The temporariness of the project process (Lizarralde et al., 2009), which leads to an important emphasis on tactical planning and cause difficulties for implementing strategic planning; (3) The temporariness of the TMO, which increases organizational fragmentation and cause difficulties for inter-firm cooperation (Davidson, 1988). The first constraint is largely explored by the theory of bounded rationality, developed by the economist and Nobel prizewinner Herbert Simon (1969). According to Simon (1969), project actors are naturally limited by both cognitive ability and information availability. Therefore, they do not have a choice between satisfactory and optimal solutions because they rarely have the means for achieving the optimum possible solution. Instead, they accept a *satisficing* [SIC] solution (his term); that is, a solution that can be considered "good enough" considering the effort required to obtain it and the resources available.

Affected by these constraints, project decision makers must make decisions within high levels of uncertainty (Simon, 1969), which particularly increases project risks in the building industry (PMI, 2008; Lizarralde, 2004). In post-disaster reconstruction, additional constraints can be added: (1) Increased fragmentation of project actors (Lloyd-Jones, 2007; Mohsini and Davidson, 1992); (2) Reduced access to information in the state of chaos that characterizes post-disaster situations (Thanurjan and Seneviratne, 2009; Lizarralde et al., 2008; Johnson et al., 2005); (3) Increased difficulties for communication and collaboration between local and external participants (Lizarralde and Massyn, 2008; Kumaraswamy, et al., 2007; Sliwinski, 2007); (4) The pressure to act quickly (UNDRO, 1982); and (5) The lack of coordination between – necessarily interdependent – services and project outcomes (UN/OCHA, 2008; Kellet and Moore, 2003; Wisner, 2001; Salazar, 1999; May and Williams, 1986).

The review of the literature and previous case studies of reconstruction show that the principal sources of risk in post-disaster reconstruction are: (1). The non-acceptability of the project outputs by end-users (Davis, 1978; UNDRO, 1982; Oliver-Smith, 1992; Dikmen, 2006; Barenstein, 2008); and (2) The insufficient adaptation of project outputs to traditional values and local conditions (Barenstein, 2008; Bosher, 2008; Jigyasu, 2008).

The risk of non-acceptability is closely related with users' satisfaction, which – as we will see - is also related with user participation. Table 1 summarizes relevant studies, which examine the relationship between (a) user participation and (b) user satisfaction or project performance (see independent and dependent variables). This relationship has helped to emphasize the importance of effective user participation (Barenstein, 2008; Arslan and Unlu, 2006; Enginöz, 2006; Özden, 2006; Oliver-Smith, 1992; UNDRO, 1982) and to explain under what conditions participation in decision-making is valuable (Lizarralde and Massyn, 2008; McKeen et al., 1994). According to De Baar (2009) and others listed in table 1, the "top-down" approach causes "bottlenecks" which lead to inoperative communication and lower commitment and ultimately, lower users' satisfaction. However, it has also been shown that project success depends on: the complexity, the ambiguity and the uncertainty that characterize the system context (Ginzberg, 1976), and the level of centralization in decision making (Lizarralde et al., 2009; Lyon, 2009).

Research Methods

Keeping in mind the results presented in Table 1, we conducted an empirical study in order to explore the relationship between (a) the structure of the TMO established to conduct reconstruction projects, and (b) the satisfaction of end-users.

Table 1. Relationships found in the Literature on Post-Disaster Reconstruction.

Author	Independent Variable (IV)	Dependent Variable (DV)	Results (IV-DV)
Davis (1978, 1981)	Community participation	Users' satisfaction	Positive relationship
UNDRO (1982) et UN/OCHA (2008)	Local community participation	Success of reconstruction projects	Positive relationship
Maskrey (1989)	Community participation components	Successful implementation	Positive relationship
Oliver-Smith (1992)	Effective community participation	Community satisfaction	Significant positive relationship
Blaikie et al. (1994)	"Active measures" and approaches for the most vulnerable	Reduction of vulnerability and vigorous mitigation	Positive relationship
	Top-down approach	Increased vulnerability	Positive relationship
McKeen et al. (1994)	Users' participation	Users' satisfaction	Positive, but the strength is different depending on contingency factors
Choguill (1996)	Community participation	Project success	Depends on the efficient (or not) practice of community participation and involvement
Jigyasu (2000)	Appropriate technologies; local skills' participation	Vulnerability reduction	Positive relationship
El-Masri and Kellett (2001)	Top-down approach	Users' self-reliance and participation	Negative relationship
	Bottom-up approach	Users' self-reliance, development	Positive relationship: IV helps build DV
Alexander (2004)	Consideration of users' physical, emotional and economic attachment	Project success	VI increases the chances of VD
Lizarralde (2004) Lizarralde et al., 2009	Users' participation	Project performance	Weak positive relationship (project performance is more affected by strategic aspects)
	Project performance	Users' satisfaction	Depends on the context
	Decentralization decision-making	Successful project management	Positive relationship
Arslan and Unlu (2006)	Community participation	Understanding of community needs	Positive relationship
Dikmen (2006)	Lack of users' participation	Failure of reconstruction projects and users' refusal	Positive relationship
Enginöz (2006)	Users' participation	Users' satisfaction	Positive relationship
Monday (2006)	Principles of sustainability applied to local actions and decisions	Holistic recovery from a disaster	Positive relationship
	Public involvement and participatory processes	Sustainable reconstruction and local sustainable recovery	Positive relationship
Özden (2006)	Community involvement	Success of reconstruction projects	Significant positive relationship
Barenstein (2008)	Users' participation	Users' satisfaction	Significant positive relationship
Bosher (2008)	Centralized approach	Social refusal	Positive relationship
De Baar (2009)	Top-down approach	Users' dissatisfaction	Positive relationship
Lyons (2009)	Users' active participation and involvement	Users' acceptability	Positive relationship

Research hypothesis

Two characteristics of the TMO have an influence on the level of users' satisfaction in post-disaster housing reconstruction projects in developing countries:

- The level of decision-making centralization coupled with lack of information; and
- The capacity of the organizational structure to involve the active participation of users in project planning, management, financing and design.

The case study methodology, through qualitative analysis and observation, is the most suitable for this study because it allows developing an empirical approach to complex social and human phenomena within its own context (Lessard-Hébert et al., 1996; Yin, 2003). The case study chosen for this research is located in North Africa, more specifically, it concerns the

reconstruction project “Errous” conducted after the 2003 floods in the town of Boukamel. Considering the political context of the country and the fact that reconstruction projects in the region are often public initiatives with political interests, confidentiality clauses had to be established with project participants in order to guarantee access to information. This is a major limitation for the publication of research results. However, North Africa is a region that is poorly documented in the literature of post-disaster reconstruction. Relevant empirical knowledge is required about the way projects are conducted and organized in politically complex countries in the region. Therefore, anonymity and changes in the names of interviewees, organizations and cities are required in this article.

Printed information included official documents, reports prepared by the directions of the ministries involved in the project, agreements between actors, minutes of project meetings, studies on vulnerability, websites of the stakeholders and construction documents. The collected information was triangulated and validated (Proverbs and Gameson, 2008) with extensive site observations and data collected through three types of interviews:

1. Thirty interviews with households affected by the floods and which attempted to: i) analyze their real needs; ii) identify the consequences of relocation; and iii) reveal the possible differences between their requirements and their opportunities. Additional interviews were also conducted in Boukamel with residents who refused to be relocated, moved next to their original location and rented illegally their own reconstructed houses.

2. Five semi-structured interviews with well-known residents about the history of the city and the reaction of people regarding the reconstruction project;

3. Eleven semi-structured interviews with: the urban planner, the reconstruction project manager of the general contractor and nine officers of different ministries and agencies.

The analysis of data includes a graphic representation of the TMO and the identification of the most important decisions made during the reconstruction project. The criteria for selecting these decisions include: (a) the importance of their influence upon the choice of the relocation approach and (b) their impact on the selection of professionals and contractors for design and construction. This analysis seeks to reveal: the relations of authority, communication and coordination between the participants of the TMO, the level of centralization of decision-making and the level of users’ participation.

The ‘Logical Framework Analysis’ (LFA) was used for assessing users’ participation and satisfaction. The LFA is an important tool for managing development projects, originally developed in 1969 to help the U.S. Agency for International Development improve its planning and project evaluation system (European Commission, 2004). The LFA considers the sequence and life cycle of the process, establishes the consequences of the project application and takes into account the cause-effect relationships between different stages of the project, including: (1) the inputs, which involve the resources and the necessary activities for their exploitation; (2) the outputs, which comprise the products and services delivered; (3) the results or outcomes, which correspond to the immediate effects of the outputs; and (4) the impacts which include the final goal of the project.

Qualitative and quantitative indicators must be identified at each stage of the LFA model (Aubry and Hivon, 1994). The indicator is a pointer, a “measurement, a number, a fact, an opinion, or a perception that points to a specific condition or situation over time” (Beck et al., 1997). Following the revised version of the LF (proposed by Lizarralde, 2004), the level of users’ satisfaction was assessed through indicators based on the beneficiaries’ perception of facts and living conditions. Indicators of results correspond to the transfer (and acceptance) of knowledge, products, services or technology at the moment of outputs acquisition. It includes the use or participation of their

development by beneficiaries (Aubry and Hivon, 1994). They attempt to assess whether: i) end-users access to the product; and ii) the product meets their needs, desires and expectations
This research focuses on indicators of results, which must meet the following characteristics: (1) each indicator must support the hypothesis and represent only one aspect of housing reconstruction project; (2) indicators must have been already considered by other authors in the field of reconstruction; (3) indicators must be measurable through available methods and resources; and (4) the indicators must help compare the conditions of the reconstruction project and the conditions of the original settlement. The assessment of the indicators is based on both qualitative and quantitative information. The data is then represented and organized in standardized forms. Each indicator is analyzed in one form which includes: (1) the name of the indicator; (2) the number of the indicator; (3) the source: the reference to authors who have emphasized the influence of the indicator on users' satisfaction; (4) the definition of the indicator; (5) the statements: declarations which help define the level of users' satisfaction vis-à-vis the indicator; (6) statistics and quantitative data which permit to assess the statements; (7) the testimonials which correspond to the most relevant comments by the interviewees; (8) the assessment of the indicator which represents the level of users' satisfaction regarding the indicator; and (9) photos and plans that support the information collected.

Research Results

The village of Boukamel (36,061 inhabitants) is located in the northwest part of the country[1]. All households benefit from formal water supply and connection to electricity, whereas 94% of them are connected to the sewerage system. Meda wedi - the longest river of the country - which is at the confluence of four major wadis (water bodies) - crosses the town of Boukamel on a length of 4.4 km. In winter and during transitional seasons, climatic conditions are unstable and the average of the annual rainfall reaches 1500 mm (JICA, 2009). Water often overflows over the Meda banks resulting in floods over large areas of the town (Groupement UNI Conseils, 2006). The following vulnerabilities accentuate the risks of flooding: (1) the complexity and the heterogeneity of the Meda flooding system (Groupement UNI Conseils, 2006); (2) the unreliability of protective measures (SRPSS, 1987); and (3) the alternation of the most important floods occurred in 1973, 1990, 2000 and 2003 with exceptional drought events (Groupement UNI Conseils, 2006). Besides, the economy of the village is largely dependent on agriculture, and thus, is vulnerable to climatic conditions. The flood-prone plains are densely populated by 13.4% of the total population of the country, whereas they provide agricultural opportunities and jobs for the inhabitants of Boukamel.

In order to reduce migration to the cities, the proliferation of squatter settlements and unplanned urbanization, a set of urban and regulatory measures were originally developed by the municipality and the regional government. However, the success of these instruments was limited in terms of reducing the creation of informal settlements. The absence of citizens' participation and the lack of effectiveness generated the rejection of these measures by local citizens (Zribi, 2004). As a consequence, the floods of 2003 were amongst the most devastating in the region (see Fig. 1).

[1] The name of the country and the town has been disguised to respect confidentiality issues required by the participants that were interviewed.

Fig. 1. Damages Caused by 2003 Flooding in Boukamel (Louati, 2003-01-12).

Fig. 2. General View of the "Errous Project" (Photo: Bouraoui, 2009-05-28).

The government undertook two kinds of measures after the 2003 floods:

- **Immediate measures**: evacuate the victims, relocate the affected population, pump water and construct a culvert drain.
- **Preventive measures** planned for the medium and long term, including: (1) regulatory measures adopting new provisions for urban planning: gradual relocation of settlements located in risk-prone areas, strengthening the control of land use, refusing building permits in flood plains; and (2) technical measures based on the concept of integrated flood management.

The severity of damage led the Head of State to create two commissions which proposed the relocation of disaster 'victims' (Groupement UNI Conseils, 2006) to Errous, a piece of land located 6 Km from Boukamel (Fig. 2). The first phase of the project began in 2004 and was completed in 2006. It comprised 211 homes on a plot of 11.5 ha and included a primary school, a centre for disabled persons, a care unit, a post office, a National Guard post, a sanitation station and a pumping unit. This relocation was justified as a social project based "on solidarity, tolerance, democracy and human rights" (NAF, 2005). However, the quick selection of relocation sites is often a factor of failure of reconstruction programs (Oliver-Smith, 1992; Barakat, 2003, Dikmen, 2006). According to Oliver-Smith (1992) and UNDRO (1982), authorities often do not recognize the consequences of forced relocation, which can be more severe than the impacts of the disaster itself.

The presidential project was funded by the National Aid Fund (NAF) and involved the participation of several stakeholders (Fig. 3. illustrates the main participants and their relations in an organizational diagram - OD):

- The central government (CG)

- The Disaster committee (DC) formed by representatives of five ministries:

- The Ministry of Equipment and Housing (M4) which intervened in: (a) protection against floods through the Urban Hydraulic Direction (UHD) which implements the national strategy in this domain; and (b) urban planning by means of the Urban Direction (UD), the General Direction of

Equipment and Housing (GDEH) and the Regional Direction of Equipment of Jenba[2] (R4). The latter was an important stakeholder of the relocation including tender preparation, selection of professionals and contractors, coordination between stakeholders, and transfer of funds from the Ministry of finance (M7) to the NAF.

- The Ministry of Agriculture (M3), responsible for water management and planning specially through the Direction of Dams (DD), the General Direction of Water Resources (GDWR) and the Regional Direction of Agriculture of Jenba (R3).

- The Ministry of Interior (M6), which supports disaster prevention and rescue through the Office of Emergency Preparedness (OEP). The Governorate of Jenba (R6-1) is under the authority of this ministry. It cooperated with urban planning specialists and managed the budget of the project. It was also in constant communication with the delegation of Boukamel (R6-2).

- The Ministry of Defence (M1), which intervenes through the Regional Unit of the National Guard (R1), which works with the army and regional services of emergency preparedness on the protection against floods.

- The Ministry of Environment (M2), which intervenes through the Regional Direction of the Environment of Jenba (R2) and which seeks to implement the principles of sustainable development.

- The Technical Committee (TC), which sought medium and long term solutions through the Ministry of Agriculture, the Ministry of Equipment and Housing and the Ministry of State Land Affairs (M5) (Groupement UNI Conseils, 2006).

- The Permanent Committee of the NAF, which finances the intervention. The Regional Council (R8) developed the regional intervention program.

- The Land Agency of Housing (LAH), a private urban operator, which provides 20% of housing needs of the country (Zribi, 2004).

- The consultant in urban planning.

- The general contractor (GC).

- The firm of architecture (FA), selected by the Regional Direction of Equipment of Jenba.

Table 2 summarizes the most important decisions made during the project. The identification of the decision-makers and the stakeholders involved in each decision reflects the hierarchy of the decision-making system.

[2] Boukamel and Errous belong to the Governorate of Jenba

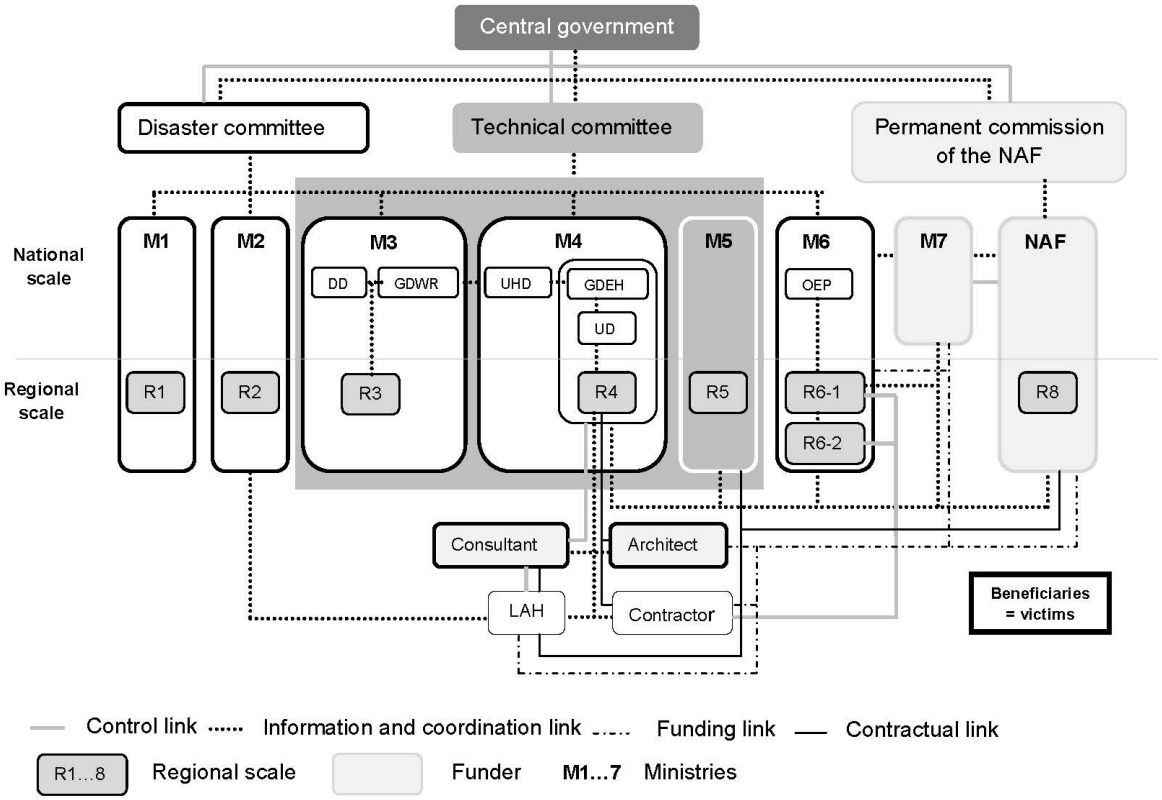

Fig. 3. Organizational Diagram (OD).

Table 2. Selected Decisions, Decision Makers and Stakeholders.

Date	Decisions	Decision makers	Stakeholders
1st decision January, 14th 2003	Formation of two committees	Central government	R6-1; R6-2; R4; M3; M4; M5
2nd decision February-march 2003	Identify short and medium terms solutions: - demolition of houses - relocation of beneficiaries	Central government Disaster committee: M1; M2; M3; M4; M6 Technical committee: M3; M4; M5	R3; R6-1; R6-2; R4
3rd decision June 2003	Development of the urban plan	R6-1	R6-1; LAH; consultant; M4: GDEH; UD; R4; M7; NAF
4th decision November 2003-January 2004	Approval of the urban design	Central government	Consultant; LAH; R4; R6-1; R6-2; NAF;
	Approval of the urban project	R6-1	
5th decision Early 2004	Selection of the architect and the general contractor	R4	R6-1; LAH; architect; general contractor

A series of diagrams (similar to the one presented in Fig. 3) were used in the study to identify within the TMO the level of decision-making centralization. This included: (1) illustrating each decision on a separate OD; (2) coloring the outline of bubbles corresponding to decision makers with a continuous line and those of stakeholders with a broken line; (3) including a vertical axis

next to each OD to project the level in which the decision was taken and executed (this axis allows viewing the organization hierarchy); and (4) superimposing all these layers on the same OD and axis. This analysis showed that:

1. Strategic decisions were concentrated at the highest level of the TMO. These decisions were made “by” the central government “for” beneficiaries with a “top-down” approach.

2. Tactical decisions were concentrated at regional level through the Regional Direction of Equipment of Jenba (R4) and the Regional Council of the Governorate of Jenba (R6-1). This regional council was composed by: the Governor, the General Secretary of the coordination committee of the democratic group (the Head of State party), the chief delegate of the Jenba Governorate, 7 members of the Council of deputies, 8 presidents of municipalities of the Jenba Governorate and 9 presidents of the Boukamel village council. In fact, many of these members represent the central government and, thus, their decisions are also top down. The interviews conducted with officials at the various ministries and the beneficiaries confirmed the lack of active participation of end-users in decision-making and the existence of a “top-down” approach developed from the central government to the regional units.

The selection of qualitative and quantitative indicators of users’ satisfaction was based on: (1) the review of the literature; (2) the investigation of the main concerns on site; and (3) the importance of users’ perception; that is, the context, the risk and facts as perceived by end-users, which are often opposed to those of experts (Jasanoff, 1998). The following indicators were finally selected:

- 1-The occupancy rate of rebuilt houses (an indicator used by Beck at al. 1997 and Dikmen, 2006)
- 2-The beneficiaries’ perception of the location of the rebuilt project in comparison with the original settlement: accessibility, distance from the town, etc; (an indicator previously discussed by Barenstein, 2008; Dikmen, 2006; Oliver-Smith, 1992).
- 3-The perception of the quality of the reconstructed houses in comparison with users’ original dwellings: including monetary value, area, number of rooms, building materials, functionality, reliability of services (this indicator includes criteria previously studied by Enginöz, 2004; Dikmen, 2006; Arslan and Unlu, 2006; Barenstein, 2008; Lizarralde et al., 2009).
- 4-The perception of the quality of the project infrastructure in comparison with the original settlement: it includes the rate of victims served by roads, water, electricity, gas, and sewer infrastructure (this indicator is based on criteria previously studied by Brown and Damery, 2002; Bosher, 2008).
- 5-The perception of preventive measures in the project in comparison with those that existed in the original settlement: they include structural and non-structural measures as diversion canals, dams, etc. This indicator reflects the level of users’ awareness and their perception of the efforts made by the State in disaster reduction (this indicator has been largely studied by Jasanoff, 1998).
- 6-The perception of community services (a primary and secondary school, a market, a mosque, a garden, etc.) in the project in comparison with the original settlement, (this indicator includes performance criteria studied by Özden, 2006).
- 7-The availability of means of transportation in comparison with the original settlement (including criteria studied by Barenstein, 2008; Özden, 2006).
- 8- Land/housing ownership (based on the criteria studied by Barenstein, 2008).
- 9-Offered/lost jobs: impacts of relocation on the creation and retention of jobs (this indicator in based on the criteria considered by Barenstein, 2008; Dikmen, 2006)

The analysis of indicators of technology transfer showed that beneficiaries feel uncomfortable in comparison with the level of well-being experienced in their original location in Boukamel. In fact, the relocation to an area located far from the former town is perceived as a major problem, which leads to a high level of dissatisfaction. A resident said:

> “Before, my family and I lived close to the town centre, where we could easily find all we need. Now, we are rather far away; we have to plan in advance because we can not commute daily, specially because I do not have a car”.

Cynic responses describe the perception of the residents regarding the preventive measures taken by the government. One of the residents said: “I have heard that there is a comprehensive plan of integrated management, including the construction of canals. But who can guarantee that I will be alive when [these projects] will be finished?”

The remoteness, coupled with a considerable lack of community services and affordable transportation means have caused both a break with the original cultural and social environment, and loss of employment opportunities especially for the poorest families. Some testimonies by the local residents confirm this pattern:

> “I am worried by my daughter, because she will have to find transportation alone to go to school. Before relocation, her mother or I used to walk with her to school.”

> “ I am not satisfied because at my age I cannot easily find a job. Before, I used to live close to the coffee shop where I could go to find available jobs. Now I lost my contacts, and here in Boukamel part-time jobs are obtained only through networks and friends.”

Discussion and Conclusions

The TMO of the Errous project adopted a largely centralized structure. This structure concentrated strategic decision-making power within a restrained number of participants located mostly in the central government. Only a reduced participation of regional stakeholders in tactical decision-making was effectively implemented and almost no participation of local stakeholders in project planning, design and management was implemented for the most important decisions regarding settlement relocation. The dissatisfaction of end-users regarding the project outcomes was identified in this study through nine indicators. The findings of the empirical study, regarding the correlation between the TMO structure, on the one hand, and users’ satisfaction, on the other hand, confirm the trend identified by many researches in the field of post-disaster reconstruction in developing countries.

In fact, confronted with limited and dynamic information, complex problems and many variables, decision makers are unable to obtain the project solution that would *satisficingly* fulfill all users’ needs and expectations. This is aggravated when the TMO adopts a centralized approach excluding users’ participation in planning, design and management of the project.

It is necessary for decision makers to reconcile perception differences, make end-users aware of the importance of their role in the reconstruction process and recognize the importance of beneficiaries’ adaptability and potential involvement. Rather than centralizing decision-making, authorities can benefit from decentralizing decisions at a level that optimizes the strengths of local stakeholders (including end-users). The study reinforces the importance of decision-making decentralization and appropriate distribution of responsibilities among project stakeholders for the success of post-disaster initiatives.

Key Lessons Learned:

- A centralized organizational structure that excludes users' participation in decision making over planning, design and management of the project increases risks and reduces the possibility of achieving end-user satisfaction.
- A balanced distribution of responsibilities among project stakeholders reduces conflicts and contributes to appropriate share of project risks.

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