

Dedication

to **Allah**

The Lord and the Sustainer of the
Worlds

May Allah accept my work and forgive any errors or
short outcomes.

Verily, my prayer, my sacrifice, my living,
and my dying are for **Allah**, the Lord and the
Sustainer of the Worlds.

He has no partner.

And of this I have been commanded, and I
am one of the Muslims.

Acknowledgment

All Praise belongs to

Allah

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A- Brief

Lately, Participatory Planning (PP) has been the focus of national and international interest by governmental and planning authorities. At the national level, this interest increased immensely after the successful Egyptian revolution on the 25th of January. More than ever before, national development needs a vision that guides the applicability of PP towards fulfilling its aims and abiding to its principles.

Three main hypotheses are proposed as success criteria for PP. These are: *Level, Time* and *Outcome of Participation*. This criteria is further presented for investigation, analysis and applicability.

The literature review of PP has shown abundantly contradictions between principles and applications. Some applications serve as good practices, but generally fail to provide a flexible model for PP. The lack of such a model makes applicability difficult in various social and environmental settings.

In addition, current applications are categorized and typified according to different scopes of interest. This led to a lack of an integrated model that tackles different aspects.

Consequently, the present research aims at providing an integrated adaptive model. In doing so, a paradigm shift is inevitable to transform the current conventional "Participatory Planning" (PP) which is inherently product oriented to "Participatory Planning Process" (PPP) which is process oriented.

PPP is intended to overcome well known drawbacks of PP such as "Low level of participation", "Long time of participation", "Unsustainable life cycle", "Difficult applicability" and marginally targeting "Helping communities".

The paradigm shift to PPP gave way to two threads of analysis which are strongly inter-related. The first is: A multidisciplinary analysis of PPP, and the second is: Complexity focused analysis of PPP.

The Multidisciplinary Analysis of PPP

Success criterion of PPP is analyzed from the three aspects.

A Planning aspect which investigates planning factors affecting level, time and outcome of participation such as dependency on planners, donor and organizers, tasks per participant, ease of practice, PP learning process and sustainability of the process.

A sociological aspect which investigates social factors affecting level, time and outcome of participation, such as social organization, resources of PP, public motivation, social exclusion, social cohesion, transparency, commitment, technophobia, and public acceptance.

An informational aspect which investigates informational factors affecting level, time and outcome of participation such as means of acquiring and updating information, impacts of using IT, collaborative information system, community networking and knowledge engineering process.

The above mentioned multidisciplinary factors are then tested in two case studies (with different settings) to assess their impact on the success of PPP.

Based on the Multidisciplinary analysis Model Requirements have been identified.

To specify governing factors of the multidisciplinary PPP, a matrix has been built mapping the success criteria (Level, Time and outcome of participation) against the governing factors grouped in the three main PPP aspects; planning, social and informational. Literature has been reviewed to study every factor to assimilate its impact on the success criteria. To verify the outcome of the study, a questionnaire was designed focusing on these factors and applied to two Egyptian case studies. Field work resulted in a list of requirements for successful PPP.

The Complexity focused Analysis of PPP.

PPP is a complex process to a great extent. This complexity could be categorized as follows:

Planning complexity could be further categorized as follows:

- the multiplicity of entities, aspects, actors, environments and steps,
- the dynamism which considers “time” as a major factor affecting all aspects of PPP,
- the non-linearity and irreversibility nature of the process.

Social complexity could be further categorized as follows:

- accumulation of unsolved problems,
- social embedment,
- external restrictions,
- internal limitations
- weak self-correction mechanisms

Informational complexity could be further categorized as follows:

- over-information,
- Fragmentation
- Volatility
- Inconsistency
- Implication of information.

Based on complexity analysis, model specifications have been identified.

Driven by a biological perspective, Object Orientation technique used in computer science was found instrumental in combining bottom up PP and information technology. Following this pass has led to investigate Agent Based Modeling which in turn lead us to what’s known as Multi Agent Modeling (MAM).

The results of the two previous analyses were finally combined to design a conceptual model for the PPP.

MAM was used for explanatory purpose utilizing its decompositional capabilities to surmount PPP inherent complexity. This enabled the decomposition of PP steps and distributing them among all entities involved in PPP. Those entities were also decomposed into packages of agents and sub-agents. The model presents the inter-relations between

agents and their collaboration to perform PPP major activities while fulfilling success criteria requirements.

An integrating matrix is presented to capture the relation of the three studied aspects of PPP, where the planning aspect is used in the model as the driving force to the social one, and the informational aspect served both to achieve their targets.

The final outcome of the conceptually built PPP model provides an approach to a genuinely bottom up PPP which enhances;

A Dynamic PPP, which provides a proactive response to threats and shortens “Time of participation” for participants.

An Adaptive PPP, which provides a reactive response to suit different settings; social and environmental.

A Regenerative PPP; which has the ability to replicate its workgroups and maximize “level of participation”.

Collaborative information system; that takes local knowledge as its fundamental base in addition to other governmental and scientific knowledge as one of the major “outcomes of participation”.

Social community network; which provides a multi modal communication center. A one which is considered as a major “outcome of participation”.

Community self-learning mechanism; which decreases dependency on external donors and organizers, provide multi meta data levels to various participants. Such a mechanism is considered as one of the major “outcomes of participation”.

Community self-organization; which depends on the biologic self-referentiality principle to initiate workgroups. Community self organization is considered as one of the major “outcomes of participation”.

Regardless the challenges involved in implementing PPP, its implementation will enhance cost effectiveness and guarantee sustainability.

B-Research Problem

The difference between the theoretical PP and the applied one is the main reason behind this research.

After going through an experience of applying PP in one of the Egyptian villages and one urban-slum area, the researcher encountered several difficulties and problems in application such as;

Low level of participation: concerning number of participants and their representation to the community.

Undetermined time of participation: as a whole, Participatory Planning could take in one area 5 times the time in another one. Also the time of participation for each participant, is extremely variable from one area to another.

Outcome of participation: undetermined outcomes of Participatory Planning.

Personal experience in PP applicability led to identifying a gap between principles of PP and methods of applying it. Currently adopted PP methods actually minimize participation, marginalize the poor, and give more power to the rich over them.

Such applicability significantly reduces participation, and leads to deviating it from its real objectives, thus renders PP ineffective and unpractical.

Research problem could be briefed in two points:

1- Lack of a realistic PP: The reductionist ineffective applicability of PP proved its failure in fulfilling the main aims and objective of PP. This failure empties PP from its real meaning.

2- Lack of an adaptive model: Even though it is recognized that there are enormous numbers of case studies and best practices that serve as useful methodologies and tools of applying PP, none could serve as an adaptable model suitable for application in various social, economic and environmental settings.

C-Research Questions

To tackle the discussed research problem, the research seeks to find answers to four questions:

What are the features of the theoretical PP that could help understand problems of applicability?

How could the “Level of Participation” affect the success of PP?

How could the “Time of Participation” affect the success of PP?

What are the “Outcomes of Participation” required for the success of PP?

D- Research Hypothesis

The research adopts an analogy between the plant and the PP.

On the right is an analogy previously undergone by Muf Art and Architecture for the Urban Summit, 2002 concerned mainly about architecture and participation. It symbolized the participation as a plant where its roots is the participation of the local artists, local communities, City council, county council, etc and its fruits; community cohesion, increased sense of security, valuing cultural assets, valuing local knowledge, civic pride, etc.

On the left is an extension of Muf’s analogy to PP, where the root of the plant represents the “level of participation”, the stem represents the “Time of participation” and the fruits represents the “Outcome of Participation” .

This analogy has further acceptance and rationality due to the similarities found between the plant and the PPP;

- They both grow bottom up.

- They both have duration of growth.

- They both have roots, stems and fruits.

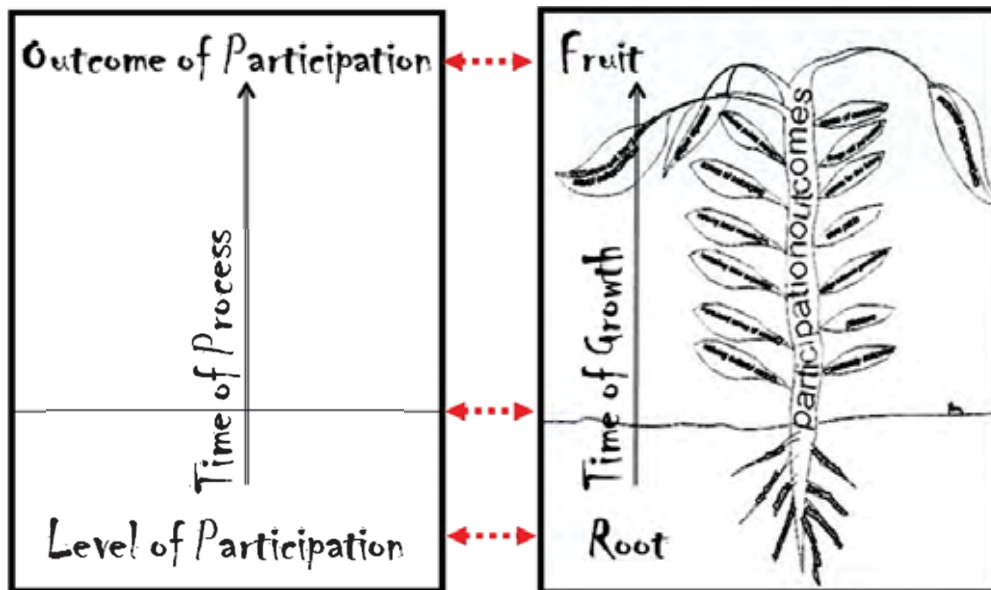


Fig. i: research hypothesis: biologic analogy between the success factors of the P.P.P. and the fruitfulness of a plant

Source: right: biological plant adopted from Muf Art and Architecture with modifications, edited by Jones, et al, 2005.

Left: researcher. 2007.

If PPP roots are the participants;

The more citizens participating in the process, the stronger the PPP is.

If PPP stem is the PPP set up;

The more sustainable the PP committee is, the more outcomes the process could produce.

If time of fruitfulness is the "Time of participation;

The shorter the time of PPP is, the higher the rate of outcomes.

If fruits are PPP outcomes;

The more useful, acceptable, sustainable and public satisfying the outcomes are, the higher the value of PPP.

Such a hypothesis forms the success criteria of the PP which the research seeks to analyze, through literature review then test it in local case studies.

D-Aims and Objective of Research

The proposed PPP model aims to;

1. maximize level of participation
2. Study the PP from multidisciplinary aspects to identify various factors affecting its success.
3. Explore flexible means of PP applicability.
4. Shorten time taken to reach outcomes of PP.
5. Form a guideline of the expected outcomes of a successful PP.
6. Explore means to simplify PP tasks and shorten time contributed by each participant.

E- Research Methodology

The study goes through four methodological steps illustrated in fig. ii in the process of solving the research problem :

- Problem analysis
- Investigating solution features
- Identifying solution
- solution design

Each of these steps could be briefed as follows:

First: the research starts by reviewing PP origins, principles, aims and methods, discovering if application abides with original principles and aims or not.

Second: the research investigates features of a successful PP, through which solutions could be figured out.

Third: Solutions are consequently tested together with the research hypothesis on local case studies.

Fourth: a solution for PP could be designed with some sort of precision.

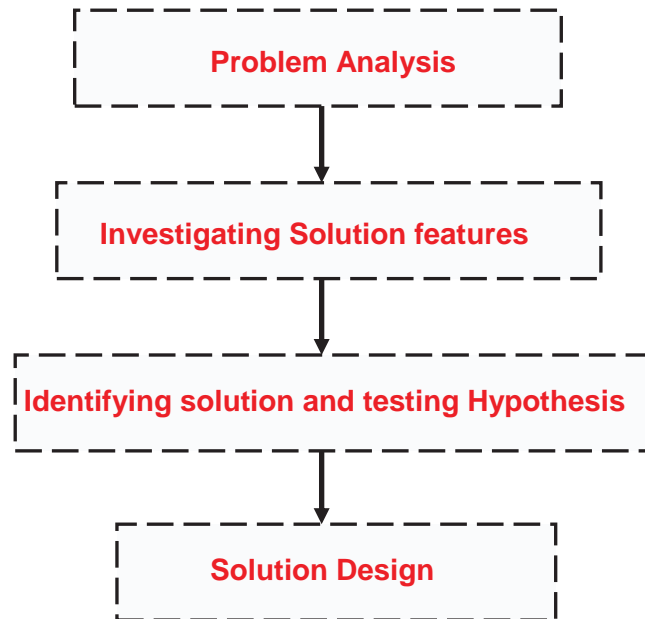


Fig. ii: methodological parts of the research
Source: researcher

F- Organization of the Study:

The research is divided into four parts and seven chapters. Fig. iii, illustrates the organization of the study.

The four parts of the research are sequenced and briefed as follows:

Part one: *Literature review and critical analysis of the Participatory Planning*

Part one presents the research problem, where it identifies the gap between the principles and aims of the PP and the applied one. This part comprises one chapter, Chapter One: “Participatory Planning Revisited”

Part Two: *Analysis of Solution Space; Success Criteria and Complexity*

Part two presents the analysis of the solution space presented in the success criteria, and the third paradigm shift features. It concludes with

the PPP model requirements and specifications. This part comprises two chapters; Chapter Two: “Participatory Planning; The Third Paradigm Shift” and Chapter Three: “Complexity of PPP; Problem and Solution”.

Part Three: Solution identification and testing Hypothesis

Part three presents PPP model abiding with both requirements and specifications form part two. It comprises two chapter; Chapter Four: “PPP through Multi Agent Modeling” and Chapter five:” Analysis of PP Model; The Egyptian Experience”.

Part Four: *Solution Design*

Part four presents design of PPP model and conclusions of research. It comprises two chapter; Chapter Six:” Design of PPP Model” and Chapter Seven: “Conclusion and Further Research”.

The seven chapters of the research are sequenced and briefed as follows:

Chapter One: Participatory Planning Revisited

Chapter one identifies of the nature of Participatory Planning, its origins, principles, aims, objectives, methods, functions and the two paradigmatic shifts of its development.

Furthermore, it provides critical analyses of the current Participatory Planning and compares between Participatory Planning the "Hoped for" and "The Applied", articulating on how the latter shows little respect for the former.

Chapter Two: Participatory Planning; The Third Paradigm Shift

Chapter two presents the literature review that analyses the research hypothesis of the success criteria of the PPP. It then identifies dominant features of PPP that could help mend the gap between PP principles and its applications.

Multidisciplinary nature is the first feature of PPP. This feature urges the analysis of the challenges of PP from three aspects; planning, social, and informational. Each aspect has an effect on the Success criteria of PPP;. Each aspect is counter checked with the three success criteria; Level, Time and Outcome of Participation and factors affecting each.

Complexity is the second feature on the PPP. This feature is interconnected with the first, where the complexity of PPP has three aspects, social complexity, planning complexity and informational complexity. The chapter concludes with identifying the problem space of the research.

Chapter Three: Complexity of PPP; Problem and modeling Solutions

Chapter three analyses of the PPP complexity from multidisciplinary aspects; Planning, Informational and Social, then clarifies the need for **Modeling** to face complexity of PPP, and nature of the required model to face previously analyzed complexities.

Finally it explores biologic solutions offered by complexity science and cybernetics through the presentation of their development in general, and how each of them could reflect solutions to the PPP problem space.

Chapter Four: PPP Through Multi Agent Modeling

Chapter four presents PPP model specification concerning type: Multi agent Model (MAM), level: Conceptual, language: Unified Modeling Language (UML). Each specification is studied according to the conceptual bases of MAM, the “Object Orientation Analysis and Design” or the (OOAD) as an introduction to the analysis and design phases in the chapters five and six.

Chapter Five: Analysis of PP Model; The Egyptian Experience

Chapter five completes the analysis phase by presenting analytical comparison of PP in two Egyptian case studies according to success criteria of PPP. It records measurements of the *level, Time and Outcomes* of participation in the two case studies, with detailed analysis of the

factors affecting each of them. Conclusion of analysis ends with the formation of PPP model requirements table,

Chapter Six: Design of PPP Model

On bases of OOD, chapter six presents the PPP model design using UML diagrams. The presented PPP model identifies fundamental agents, their functions, internal and external relations, and their collaboration to satisfy all PP functions.

Chapter Seven: Conclusion and further Research

The last chapter presents thoughts about model applicability especially in Egypt, challenges of applicability and further research.

Coordination between research organizations with the methodological steps is presented in fig. together with the outcomes of each chapter through the undergone methodological step.

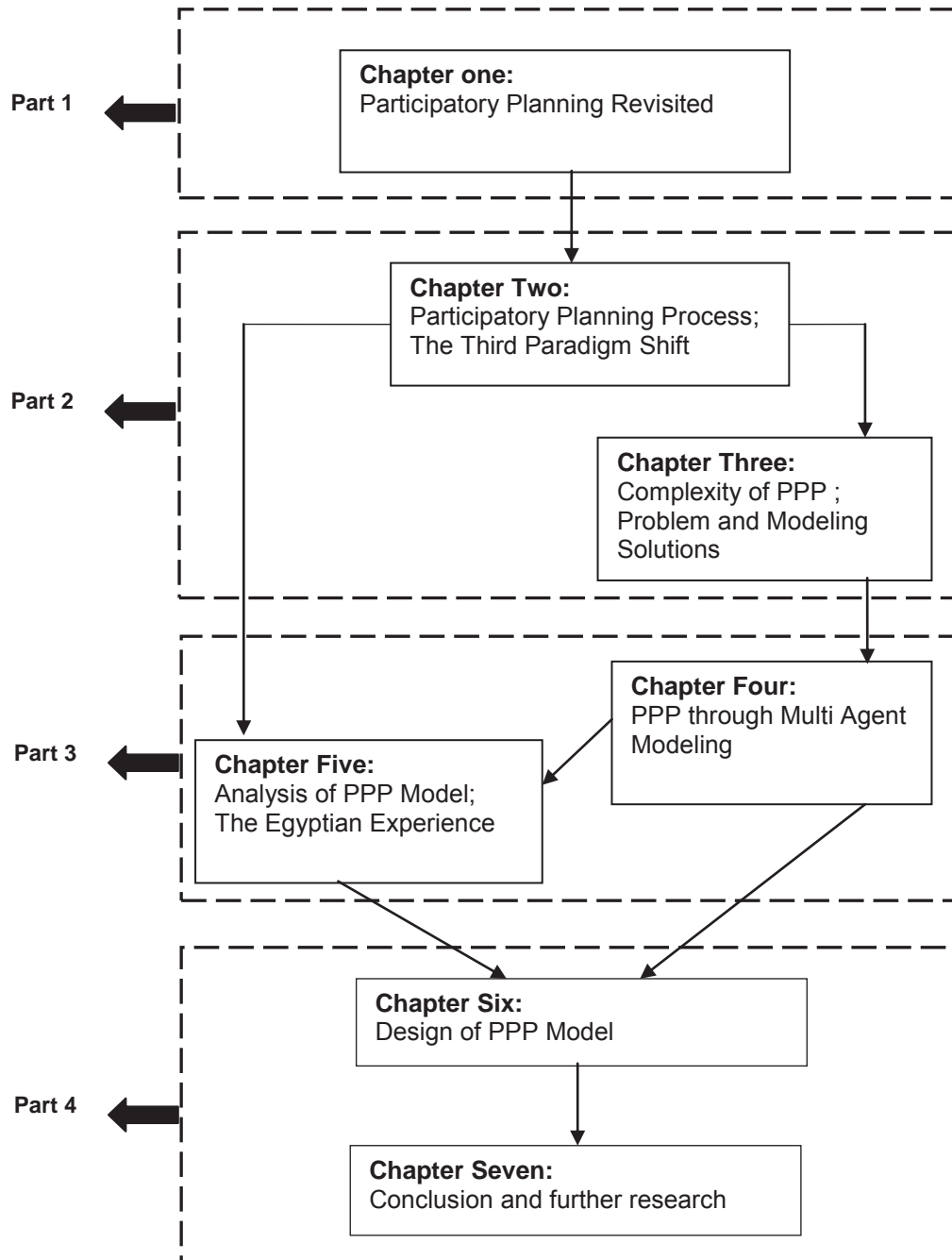


Fig. iii: Research Organization
Source: researcher

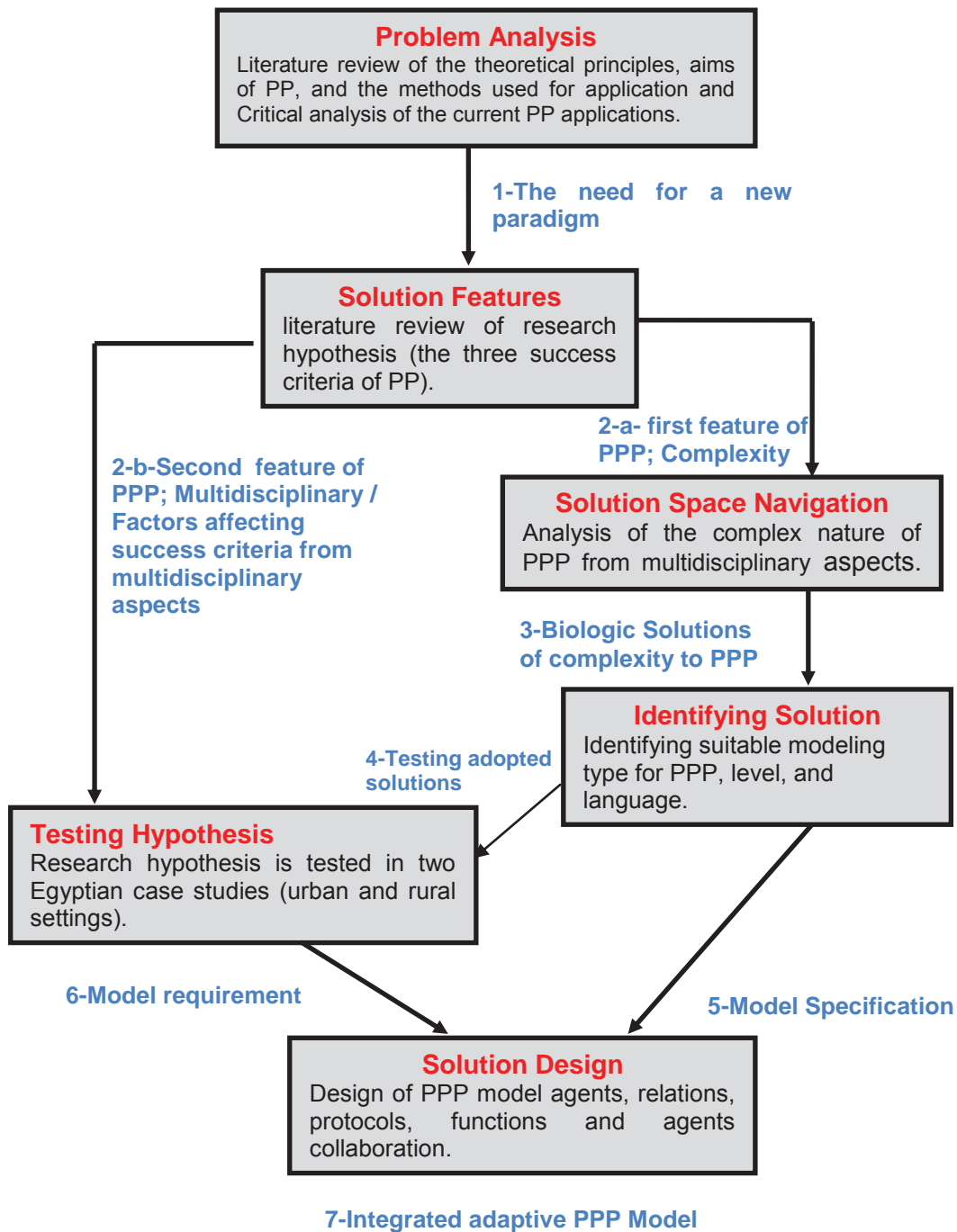


Fig. IV: Research skeleton showing Methodological steps and outcomes of each step

Source: researcher

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K- Acronyms

ABM	Agent Based Modeling
ABM/LUCC	Agent-Based Models of Land Use-Cover Change
AML	Agent Modeling Language
CA	Cellular Automaton
CAPMAS	Central Agency for Public Mobilization and Statistics
CASE	Computer Aided Software Engineering
CL	Collective Intelligence
CIML	Computational Intelligence and Machine Learning
CP	Community Profile
DNA	Dynamic Network Analysis
EA	Evolutionary Algorithms
FIPA	Foundation of Intelligent Physical Agents
GIS	Geographical Information System
GOPP	General Organization of Physical Planning
GTZ	German Technical Cooperation
HBNRC	Housing and Building National Research Center
HDGC	Committee on the Human Decision of Global Change
IAPAD	International Approaches to Participatory development
IBP	International Budget Partnership
IDG	Integrated Development Group
ICA	Institute of Cultural Affairs
ICT	Information Communication Technology
IIED	International Institute for Environment and Development
KFW	The German Bank of Development
KISS	Keep it Simple and Stupid
LAAP	Local Area Action Plan
LAP	Local Area Profile
LIF	Local Initiative Fund

LPC	Local Public Council
PLA	Participatory Learning and Action
PP	Participatory Planning (The product oriented)
PPC	Participatory Planning Committee
PPP	Participatory Planning Process (The process oriented)
RRA	Rapid Rural Appraisal
PRA	Participatory Rural Appraisal
PRA	Participatory Reflection and Action
SNA	Social Network Analysis
SWOT	Strength-Weakness-Opportunities-Threats
MAM	Multi Agent Modeling
MAS	Multi Agent System
MHUUC	Ministry of Housing Utilities and Urban Communities
MN	Mansheit Nasser
NGO	Non-Governmental Organization
OO	Object Orientation
OOA	Object Orientation Analysis
OOD	Object Orientation Design
TOR	Terms of Reference
UML	Unified Modeling Language
UNDP	United Nations Development Program

Introduction

This chapter identifies the origins of Participatory Planning, its principles, aims, objectives, methods and steps.

Furthermore, it provides critical analysis of the current Participatory Planning and compares Participatory Planning the "Hoped for" with "The Applied", articulating on how the latter shows little respect for the former.

This in turn would shed more light on the discrepancies present in the current approach and its deviation from principles of Participatory Planning.

Critical analyses of the conventional PP procedures manifested many reasons for its failure in confronting challenges of applicability such as complexity and dynamism and interaction.

Chapter one is divided into three sections;

- 1.1 Presents the development of the planning process in terms of two major Paradigmatic shifts as follows;

The first shift from "Planning" to "Planning with "Participation"

The second shift form "planning with participation" to "participatory planning".

Such level of participation turned planning process to be bottom up oriented rather than top-down as in conventional planning.

- 1.2 Presents the aims, origins, principles, methods and steps of the Participatory Planning

- 1.3 Identifies the gap between principles of PP and its applications, critically analyzing current methods of applications.

1.1 MAJOR PARADIGMATIC SHIFTS

Participatory Planning PP is the outcome of more than a paradigmatic shift¹ that helped in shaping it to reach its current status. Many reasons were behind those shifts. The most dominant of them all is the rising call for democracy from population side added to the stress, frustration and failure of conventional planning to meet people's dreams, hopes and planning aims.

Through revising the literature review of early identification of Participatory Planning, Jamieson Neil in 1987, was one of the early recognizers of "Participation in Planning" as a new paradigm. In his paper "The paradigmatic significance of RRA (Rapid Rural Appraisal)," delivered at the International Conference on Rapid Rural Appraisal at Khon Kaen in 1985. Jamieson argued that RRA, with its rapid learning, fitted and supported a new and emerging paradigm of development.

This was the beginning of the first shift identified by this research as a transformation; from "Conventional Planning" to "Planning with Participation" At that time, "Planning with Participation" included people's right to know government's plans and budgets, as well as the right to approve or reject them.

In 1984, Clavel presented an early application of the so called "Planning with Participation", in his book "Progressive city: Planning and participation". He presented an application that took place in 1979 at Berkley in the U.S which opened up the process of government to wide citizen participation. The great procedural change the Berkeley progressives brought about was

¹ Refer to appendix A for the definition of paradigm and paradigm shift

the Fair Representation Ordinance, where Berkley citizen action gained control of the government which made certain organizational reforms in the internal process of the government.

After 13 years from Neil's identification of the "Planning with Participation" as a new paradigm, Chambers described PRA (Participatory Rural Appraisal) as an emergent paradigm (part of a more general paradigm and new professionalism as he called it), which moves in parallel with paradigmatic shifts taking place in four major domains in human experience: the social and natural sciences, in business management, and in development thinking. (Chambers R.1994)

Chambers PRA calls for even more democracy and gave local people the right to actually plan for themselves, with minimal support from professional planners, who act as facilitators and catalysts for the planning process.

The shift from Neil's to Chamber's identifications of the participatory planning, is highlighted in this research as the second paradigmatic shift from "Planning with Participation" to what's currently known as conventional participatory planning "PP".

As will be seen in the following section, though the first shift was a sharp one; adding a new dimension to planning by involving people for the first time in the planning process, the second shift was a smooth one. During the second shift, participatory planning went through several steps to reach Chambers paradigm. It commenced with mere public right to know (budgets, plans, etc.) and increased step by step (as will be shown later in participation ladder) to reach what's known as the conventional participatory planning PP.

A close look at the first and the second shifts is presented as follows:

1.1.1 FIRST SHIFT: FROM CONVENTIONAL PLANNING TO PLANNING WITH PARTICIPATION

The Conventional Planning is one kind of the "Top-Down" approach which is dealing with problems of urban/rural planning at both the local and national level from a speculative view of hierarchical authority chains.

The calls for democracy that rise increasingly day by day could have never got that loud except with the increasing frustration and oppression resulting from the top-down approach that prevails in bureaucratic environments. The top-down approach has so long dominated the lives of developing nations, and took their rights away, while serving the interests of governments and powerful entities.

Chances of success of such approach depend mainly on the wisdom and knowledge of a group of people, those in charge. In this approach, identification of problems arising at any level comes from higher authorities. Application, maintenance, management and evaluation of the condemned plan (if it exists) also come from higher authorities.

"First, the complex nature of the fast changing cities and the problems faced by their low income majority cannot be successfully managed by reductionist, professionally dominant, top-down planning, nor can city plans be easily rationalized deductively according to prescriptive blueprints or master plans. Planning based on these means is mechanistic and often makes things worse. It demands sources of information, accuracy of data, surveys and site plans as well as comprehensive understanding, political goodwill, economic stability and institutional capabilities- all of which are in short supply."

(Hamdi Nabil R: Chapter 2, P:30, 1997)

There appear to be so many reasons why conventional (Top-down) planning practice is changing in different countries and shifting towards a more participatory one. Cliff Hague, et al, (2009) highlighted three of those reasons;

- *public distrust of planning based on past practices;*
- *governments' desire to improve the co-ordination between different sectors (eg transport, housing, economic development etc), and between different scales of policy and action (eg national - transnational in some cases - regional and local);*
- *Recognition amongst governments and nongovernmental organizations that sustainable development requires consensus-building and engagement with citizens.*

Consequently the calls for passing more authorities to the poor, and starting the planning from bottom up, aroused as poverty and chaos spread rapidly in poor developing countries, as Mark Malloch Brown a UNDP administrator mentioned;

"(If we are to realize) ...having extreme poverty by 2015, good governance must operate... at the local level, through effective targeting of poverty and its chains... For this we need programmers that are light in terms of overhead, are leverageable, and, above all, enjoy full community ownership, participation and control over direction setting. "

Therefore the rise of the term "Public Participation" was inevitable. Pragmatically it means "Planning with Public Participation" as Cliff Hague, et al, (2009) defined it as follows:

"Public participation is a process led by the planning authority. The planners try to anticipate the needs of the public and to synthesize them into a plan that meets the needs of everyone, while also conforming to national policy. Participation fits a timetable that is set, but not necessarily adhered to, by the planning authority. It involves a series of formal stages beginning with exploration of issues and ending

with a plan. The flow of information is mainly from the planners to the public, who are given opportunities to comment.”

This definition shows how Public Participation was comprehended just as the right to comment on plans done previously with planners. Small as it might seem (regarding the degree of participation), but the first shift was a big one in its concept and meaning. Taking people into consideration and involving them was the start of the bottom up approach which paved the road to a whole new meaning to Planning as planners used to know and practice it. It wasn't until the second shift took over, that the degree of participation in planning steps increased gradually.

1.1.2 SECOND SHIFT: FROM PLANNING WITH PARTICIPATION TO PARTICIPATORY PLANNING

Unlike the first shift which came with a new kind of Planning and took a sharp change of path from the Top-Down approach to the Bottom-Up one, the second shift, from "Planning with Public Participation" to "Participatory Planning" was smoothly climbing up the ladder of Participation presented in Fig.1. While the former is done by the planners and higher authorities and the public have the right to know and object or accept, the latter is done by the public themselves, with the help of planners and higher authorities. It involves the wide range of public local communities in identifying the emerging problems in their communities, the needs analysis and the formulation and configuration of projects aimed at improving their circumstances.

The second shift was actually a shift in public's share in the planning process. It is a shift from having the opportunity to comment on the government's plans (the optimum share that could be given to the public

when applying the former term) to having the upper hand in handling the whole planning process. It manifests the Bottom-Up approach as could be more clarified with the definition of "Participatory Planning" stated by Cliff Hague, et al, 2009:

*"Participatory planning is a set of processes through which **diverse groups** and interests engage together in reaching for a consensus on a plan and its implementation. Participatory planning can be initiated by any of the parties and the forms it will take and the timetables are likely to be negotiated and agreed amongst participants. The process is rooted in the recognition that society is pluralist and there are legitimate conflicts of interest that have to be addressed by the application of consensus-building methods. Participatory planning is culturally aware and sensitive to differences in power, and seeks to ensure that these do not pre-determine outcomes".*

The tone of participation even went louder and more explicit to involve the whole community as stated in this definition:

*Participatory planning is an urban planning paradigm which emphasizes involving the **entire community** in the strategic and management processes of urban planning or community-level planning processes, urban or rural. It is often considered as part of community development processes.*

(Pierre et al, 2000)

The steps of Public Participation could be easily identified on the mentioned participatory ladder (see fig.1-1). They represent gradual increase in the level of involvement of the public in the planning process itself. Though considered a paradigmatic shift, "Participatory Planning" stressed at planning and taking decisions, excluding "Monitoring" and "Evaluation" of the resulting plan which is a public right to make sure their plans are implemented in the right way, and that their plans were right in the first place.

Important and crucial as they are for the sustainability of the process, those two steps of Monitoring and Evaluation of the plans were not mentioned neither in the definition of Cliff Hague, nor on the famous Ladder of Weidemann. Reducing "Participatory Planning" to "Public participation in the final decision" makes the process more like an open control system, which has no measurement of the difference between what is achieved and what was planned.

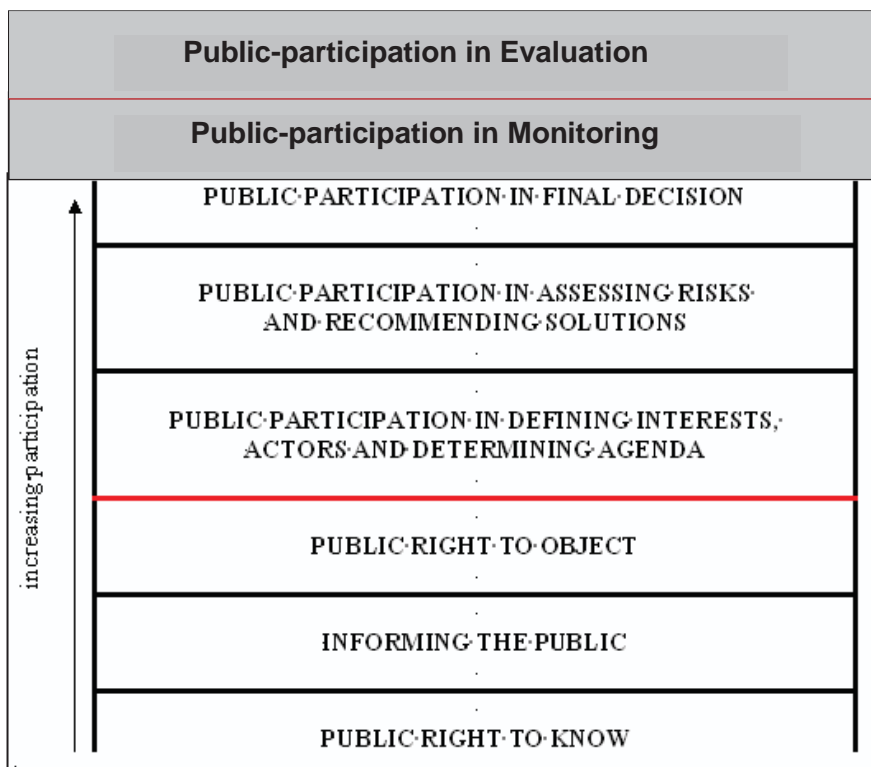


Fig. 1-1: The Public Participation Ladder

Source: Adopted from Weidemann and Femers, 1993 with researcher additional two steps

Adding those two important steps on the participation ladder renders the process sustainable through what's called "self-correction mechanism". This mechanism identifies the difference between the expected results and the actual ones. It also shows the impacts of public's plans on the socio-economic and natural environments. It serves as an alarm that something went wrong and shows the ways to correct it. It is the public's right to practice performing this mechanism to ensure transparency in implementation and to enhance communities learning capabilities. Those two steps are added and highlighted by the researcher on the participatory ladder in fig.1-1 and if applied would help turning the process from the "open control system" to the "closed loop control system" through the feedback of the community. (see Fig.1-2)

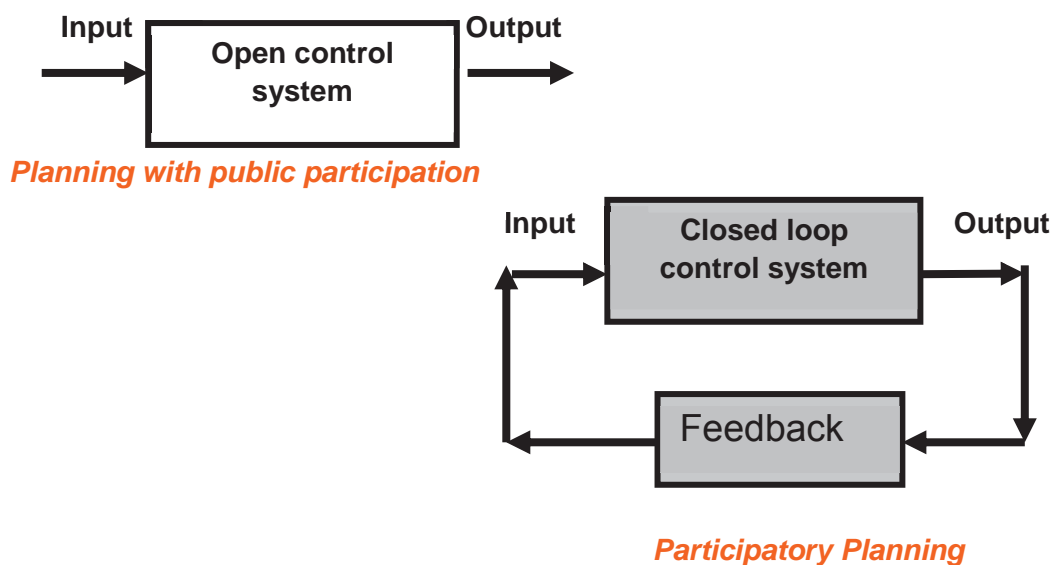


Fig. 1-2: planning with public participation diagrammed as an open control system and participatory planning diagrammed as closed loop system

Source: researcher

1.2 PARTICIPATORY PLANNING FRAMEWORK

As much as the current application of the Participatory Planning showed some kind of failure to abide to its principles, as much as its applicability deviated from the principles and aims of the original Participatory Planning of democracy and Poverty eradication. Principles and aims of the original Participatory Planning are shortly met by the current methods of applicability. As for the steps of the Participatory Planning, there is no certainty about what it is, were it took so many names and brands.

This section draws the framework of the original Participatory Planning, its Origins, aims, principles, steps and methods. This would lead to the comprehension of Participatory Planning “the hoped for” before criticizing the current applicability.

1.2.1 PARTICIPATORY PLANNING ORIGINS

The origin of the Participatory Planning was shared between sociologists, educators and planners. This origin manifests that Participatory Planning is a multidisciplinary field, shared mainly between planners and sociologists. Fred Fisher, president of the International Development Institute for Organization and Management, identifies **Paulo Freire** (1921-1997) and **Kurt Lewin** (1890-1947) as key pioneers, as well as claiming planning fathers **Patrick Geddes**² (1854-1932) and **Lewis Mumford**³ (1895-1990) as participatory planners.

² A Scottish biologist, sociologist, philanthropist and pioneering town planner.

³ An American historian, philosopher of technology and science, and influential literary critic. Particularly noted for his study of cities and urban architecture, he had a broad career as a writer.

The Brazilian Freire who came out of a poor family and worked as an educator, had an influential role in theory of critical pedagogy. He changed a lot of rules in his country when he became the Director of the Department of Education and Culture of the Social Service. (Wikipedia encyclopedia "Paulo Freire", 2010)

"Freire's belief that poor and exploited people can and should be enabled to analyze their own reality was a fundamental inspiration for the participatory planning movement".

(Fisher, 2001)

The German Kurt Lewin was known as the founder of social psychology and dedicated lots of his studies to group dynamics and organizational development. (Wikipedia encyclopedia -2-, 2010)

"Lewin's relevance lay in his integration of democratic leadership, group dynamics, experiential learning, action research and open systems theory, and his efforts to overcome racial and ethnic injustices."

(Fisher, 2001)

In the UN Habitat document "Building Bridges through Participatory Planning", Fisher identified Participatory Reflection And Action (PRA) as the leading school of Participatory Planning. (Fisher,2001)

"(PRA) is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programs."

(Wikipedia Encyclopedia , PRA, 2010)

1.2.2 PARTICIPATORY PLANNING AIMS

In general PRA has been supplanted by Participatory Learning and Action (PLA), which emphasizes the links between the participatory process and action. Related work has been done on Community-Based Participatory Research (CBPR). In 2010, the African organization Khanya Acidd, working under the CBPR umbrella, summed up the Participatory Planning Aims into the following points,

- Empowering communities - empowerment in terms of resources and authority, distinguishing communities which make the best use of funds as the ones that deserve increased grants.
- Empowering local governments – transferring power from central government to local ones in order to provide local communities with quick adequate services.

"Municipal/ local finances currently represent only 2-3% of national revenue in most countries. Sustainable decentralization requires that local governments get an assured share of central revenue".

(Khanya Acidd, 2010)

- Realigning the center – Decentralization- governments should give up the role of running services on the local level, but rather turn another role of

"Facilitating local government activities, setting standards, monitoring outcomes, providing training to lower levels, and providing rewards and penalties to improve local government performance".

(Khanya Acidd, 2010)

- Improving accountability – Transparency and Trust -reaffirming that Participatory planning follows a bottom up approach that provide sufficient accountability (transparency and trust) for the various social base of the community and ensures equity among all participants and citizens as well.
- Building capacity – taking over more responsibilities in decision making, would demand higher capabilities from society members who could serve as leaders in their communities. Technical assistance is a key factor to higher local capabilities that could further help communities in performing Participatory planning.

"Getting the participation of the poor involves a lot more than finding the right technique. It requires strengthening the organizational and financial capacities of the poor so that they can act for themselves. In searching for ways to build local capacity, we found it useful to think in terms of a continuum along which the poor are progressively empowered."

(World Bank Participation Source Book, 1996)

1.2.3 PARTICIPATORY PLANNING PRINCIPLES

Robert Chambers- identified in the research as the pioneer of the second paradigmatic shift and a leading icon of the movement of Participatory Planning- deduced the following principles from the PRA;

- Public taking over the planning mission

"Handing over the stick (or pen or chalk)"

(Chambers, 2010)

Public are generators and owners of the outcomes of Participatory Planning. Giving public the chance to learn and express themselves, while taking the role of a listener and a facilitator.

-Making sure Professionals and fund donors are only advisors of the Public

"Self-critical awareness: facilitators continuously and critically examine their own behavior."

(Chambers, 2010)

-Enabling communities with all available techniques

"Sharing: which involves the wide range of techniques now available, from chatting across the fence to photocopies and e-mail."

(Chambers, 2010)

All kinds of techniques from face to face intervention to e-mailing.

-Success of Participatory planning depends on: Trust – Transparency-

equity- openness, accountability- diversity.

"Success with participatory planning depends on the extent to which those who engage in planning accept and are guided by six principles: diversity, equity, openness, transparency, accountability and trust."

(Fisher, 2001)

1.2.4 PARTICIPATORY PLANNING STEPS

Pragmatically, it is no easy job to find clear steps of Participatory Planning. Even the term "step" which the research chose as a pragmatic means of translating aims and principles of the Participatory Planning to actions is not common. Endless tools and practices, techniques, methods, formats are everywhere in worth trusted resources like the World Bank, UN Habitat, NGOs, and CBPR. However, no clear translation into a one, two, three step could be comprehended and applied.

Forming functional steps of the Participatory Planning was a deduction task that the research could not skip at this point of analysis. Functional steps

are commonly found in literature of Participatory Planning under the term “Action Planning”. Although Action Planning is commonly used in urban areas and could be used in both small and large scale strategic planning, yet there are many common characteristics between PRA and action Planning as distinguished by Hamdi Nabil. Those operational characteristics are as follows:

- *Problem based and opportunity driven*
- *Based on achievable actions*
- *Participatory, encouraging rapport and partnerships*
- *Reliant on local knowledge and skills and traditional wisdom*
- *Non-reliant on complete information*
- *Small in scale, community based*
- *Incremental rather than comprehensive plans*
- *Starting points rather than end states*
- *Fast, not rushed*
- *Visible, tangible outputs.*

(Hamdi, 1997 P: 30)

Menu of operations and techniques of action planning mainly characterized as an urban setting is shown as Hamdi, 1997, identified it as follows;

- *Direct observation(looking)*
- *Semi-structured interviews(Listening)*
- *Measuring and learning from precedents*
- *Resource surveys*
- *Prioritizing*
- *Brainstorming*
- *Diagramming*
- *Mapping and modeling*
- *Gaming and role play*
- *Workgroup and intermixing*

(Hamdi, 1997 P: 34,35)

On the other hand Chambers had another menu of the PRA which is more applicable in rural settings;⁴

"Hundreds of participatory techniques and tools have been described in a variety of books and newsletters, or taught at training courses around the world. These techniques can be divided into four categories:

- *Group dynamics, e.g. learning contracts, role reversals, feedback sessions*
- *Sampling, e.g. transect walks, wealth ranking, social mapping*
- *Interviewing, e.g. focus group discussions, semi-structured interviews, triangulation*
- *Visualization e.g. venn diagrams, matrix scoring, timelines"*

(Chambers, 2010)

Fig.1-3 presents a sum of up both urban and rural operations of both Hamdi and Chambers respectively, regrouped into general functional steps in a deductive way by researcher. The presented functional steps serves as a general presentation of PP that applies to both rural and urban settings.

1-Data Collection: which includes several types of data (local, municipal, and scientific), and collection techniques.

2-Internal Structuring: this step has to do with the internal social organization of the workgroups.

3-Problem Analysis: this step has to do with the reasons and impacts of the problems as well as the techniques of analysis.

4-Learning: introducing participatory planning to the public and public's capacity building and experience over time and practice.

⁴ See appendix B for PRA Common Principles

5-Decision Making: has to do with decision support systems, parameters of evaluation and public voting.

6-Self-Correction: this is an additional step added by this research to ensure that monitoring and evaluation sustain the adaptability of the solution chosen / applied to the dynamic environments.

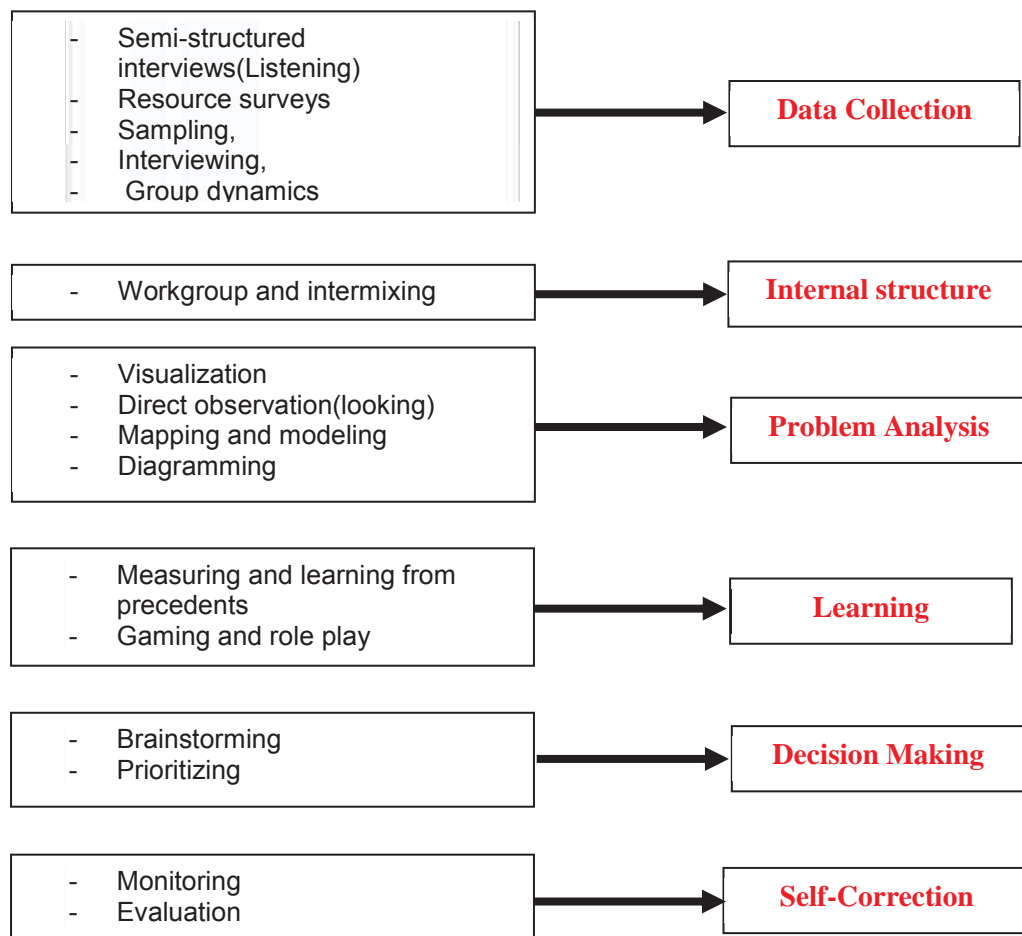


Fig. 1-3: Deduced Functional Menu of the Participatory Planning. The function of Self-Correction is added by the researcher.

Source: researcher.

1.2.5 PARTICIPATORY PLANNING METHODS

There are many types of methods for applying PP. The research at this stage is not trying to mention and explain each of the PP methods; rather it is trying to reach to a categorization of those methods to identify which is suitable for which case. Categorizing and typifying methods of PP would be presented according to purpose of usage, setting of applicability, aspect of interest, special function accomplishment, and still could be typified under many other categories.

The World Bank offered a detailed study of some of PP methods and tools⁵. Also The International Institute for Environment and Development (IIED) mentioned a lot of the methods under the name of inquiry tools;

"The interactive involvement of many people in differing institutional contexts has promoted innovation, and there are many variations in the way that systems of inquiry have been put together.

(IIED, 1994)

The interests and scopes of each of methods or inquiry tools listed by the IIED, or mentioned by the World Bank are very variant. Whenever there is a special peculiarity of the setting of the PP, or the problems that it might face in applicability, there emerged a new method to try to help the complexity of a peculiar situation. The research at this point had to analyze which method serves which purpose, or which method is suitable for which situation and setting. Table 1-1 is an organization of the chaos of methods mentioned by the IIED into previous mentioned types of categorization.

⁵ Refer to the World Bank Source Book, Appendix I, (1996), for details on each method, its definition and applicability.

Those methods could be typified and differentiated according to the following interests and scopes;

- a- Settings based methods; differentiating between methods that are suitable for urban settings and those that are suitable for rural.
- b- Function(s) based methods; methods typified to serve one or more of the functional steps mentioned in the previous section, like data collection or analysis, education (learning), monitoring and evaluation.
- d- Aspect based methods; special methods interested in one of many aspects (environmental, social, technological, agricultural, etc.).
- c- Problem based methods; in any aspect (environmental, social, technological, agricultural, etc.) there are various methods tackling a special kind of problem, like for example poverty and food security, health methods, all concerned with the social aspect.
- e- Workshop and based methods; methods performed mainly inside workshops in urban settings.
- f- Community based methods; methods performed mainly in field (learning by doing on site) in rural settings.

Detailed study of each of the methods stated by the IIED in table 1-1 is not the aim of the research at this point. Discussion and analysis is focused on the search for a method that could be applicable in any setting, suits all aspects, convenient to broad spectrum of society and easily applicable to the identified PP functional steps. It is very difficult to go through each and every one of these methods, but organizing them under these categories makes it clear that there is no method that suits all cases. In addition, any case might require more than one method for its application.

Table 1-1: Different methods of Participatory Planning	
Source: IIED, 1994, and categorization done by researcher	
Method Name	Abbreviation
Community based methods Self-esteem, Associative Strength, Resourcefulness, Action Planning, and Responsibility Participatory Rural Appraisal	(SARAR); (PRA)
Workshop based methods Appreciation-Influence-Control Objectives-Oriented Project Planning Team Up Micro-Planning Workshops; Planning for Real	(AIC), (OOPP), - - (PfR);
Function(s) based methods Participatory Monitoring and Evaluation Development Education Leadership Teams Diagnosis and Design Participatory Analysis and Learning Methods Beneficiary Assessment Process Documentation; Rapid Appraisal Rapid Assessment Procedures Rapid Assessment Techniques Rapid Catchment Analysis Rapid Organizational Assessment Theatre for Development; Training for Transformation Visualisation in Participatory Programmes Zielorientierte Projekt Planung	(PME); (DELTA); (D&D); (PALM); (BA); - - (RAP); (RAT); (RCA); (ROA); (TFT); - (VIPP); (ZOPP).
Setting based methods Diagnostico Rural Rapido Groupe de Recherche et d'Appui pour l'Auto-Promotion Paysanne Participatory Rural Appraisal Participatory Rural Appraisal and Planning Participatory Urban Appraisal Rapid Rural Appraisal Village Appraisal	(DRR); (GRAPP); (PRA); (PRAP); (PUA); (RRA); (VA);
Problem based methods Farmer Participatory Research; Farming Systems Research; Agro-ecosystems Analysis Participatory Poverty Assessment Participatory Poverty Monitoring Rapid Food Security Analysis Rapid Assessment of Agricultural Knowledge Systems	- - (AEA); (PPA); (PPM); (RFSA); (RAAKS);
Aspect based methods Participatory Technology Development Rapid Ethnographic Assessment Participatory Social Assessment	(PTD); (REA); (PSA);

For example if Participatory Planning is to be applied in a rural setting, one might want to go through rural methods highlighted in table 1-1, as well as community-based methods, for those special groups that learn by doing, workshop -based methods, for those who have time and space for workshops, and then go through analysis methods, data collection methods, monitoring and evaluation methods, and so on for each single functional step of the P.P.

In fact, this argument is supported by the Committee on the Human Decision of Global Change (HDGC), which states that participatory methods proved their success in some cases, while proved their failure in others;

"So it is reasonable to ask if certain formats (methods) work better generally, or in some circumstances, than others. However, the evidence does not support such conclusions. Various public participation formats have been successful in achieving the goals of high-quality and widely acceptable assessments and decisions, and each format has also failed at times in achieving these goals."

(HDGC) 2009.

As a sample of the inflexibility of IIED methods, the World Bank critically compared between the "Community based methods" and the "workshop based methods". (See table 1-2). Such a comparison supports the argument that neither method provides flexibility in application. The World Bank's comparison distinguished the difference between the "workshop based methods" and the "community based methods" in a trial to come out with what's positive and negative about each of those two methods.

Both workshop and community based methods are targeting short term, small scale projects with little or minimal participation. Both considered the community as one group of people in a naive simplicity. A Community is far more complicated and diverse than reducing it to one homogenous group of people.

By applying the first method, “workshop based method”, there is an assumption that the whole community could agglomerate in workshops in addition to the assumption that all community is qualified to do that i.e. Educated, have enough time, there is room for everybody, and everybody is willing to take part in PP, etc.)

Workshop Based Methods		
<p><u>Definition</u> Collaborative decision making often takes place in the context of stakeholder workshops. Sometimes called “action-planning workshops,” they are used to bring stakeholders together to design development projects. The purpose of such workshops is to begin and sustain stakeholder collaboration and foster a “learning-by-doing” atmosphere. A trained facilitator guides stakeholders, who have diverse knowledge and interests, through a series of activities to build consensus.</p>	<p><u>Strengths</u></p> <ul style="list-style-type: none"> • Encourages “social learning” • Promotes ownership • Produces a visual matrix of project plan • Stakeholders establish rules of the game • Stakeholders establish working relationships 	<p><u>Avoiding Pitfalls</u></p> <ul style="list-style-type: none"> • Completed matrices should not be considered unchangeable. • Workshops should be part of a plan that involves all stakeholders • Not all stakeholders are comfortable in workshop settings. • Measures should be taken to give voice to less experienced public speakers. • Choice of workshop location should be accessible to local stakeholders
Community Based Methods		
<p><u>Definition</u> In many projects, Task Managers and project staff leave government centers and board rooms to undertake participatory work with local communities. Task Managers work with trained facilitators to draw on local knowledge and begin collaborative decision making. In such settings, local people are the experts, whereas outsiders are facilitators of the techniques are there to learn. The techniques energize people, tap local knowledge, and lead to clear priorities or action plans. Such techniques use local materials and visual tools to bridge literacy, status, and cultural gaps.</p>	<p><u>Strengths</u></p> <ul style="list-style-type: none"> • Based on interactive, often visual tools that enable participation regardless of literacy level • Demystifies research and planning processes by drawing on everyday experience • Participants feel empowered by their participation and the sense that their contributions are valued. 	<p><u>Avoiding Pitfalls</u></p> <ul style="list-style-type: none"> • PRA or training alone does not provide local communities with decision-making authority or input into project management. These features must be built into the project. • These techniques generate positive energy, which will quickly subside if it is not channeled into actual tasks and programs. • Trained facilitators are necessary to guide and synthesize these exercises.

Table 1-2: comparison between workshop based method and community based method

Source: Bremer A. and Porst C., P: 13, 14 (2001) adopted from World Bank source, R: Appendix I, P: (1996),

The second method, “community based method”, adopted the assumption that all community members could move together in one group to solve their problems on site and that most participants are illiterate and completely unqualified to manage their community in workshops.

In any community there is diversity of social characteristics; there is the rich and the poor, there is the educated and the illiterate, there is the active and the passive; there is the youth and the elder... and so on. If this diversity is ignored or reduced through an assumption of social unity in P.P. application methods, then the outcomes would be far from those aimed for and mentioned in the first section.

1.3 CRITICAL ANALYSIS OF CONVENTIONAL PARTICIPATORY PLANNING

The main target of the critical analysis is highlighting the research problem. There is a gap between PP principles and aims, and the methods used to apply them. Methods used are inefficient to reach the targets, principles and level of participation depicted in the principles led beforehand.

More specifically, short comings of the current methods could be summarized as;

- a-Poor flexibility,
- b-Non-easy, time consuming applicability,
- c-Participation minimization,
- d-High dependency on professionals and donors,
- e-Challenges of public learning,
- f-Moving down the ladder of participation.

Each of the previous points is further explained with more details as follows;

a- Poor Flexibility (Absence of a model for PP)

From previous analysis of methods, there is no perfect method or a model that could be flexibly applied to any case study, be it urban or rural.

This fact was actually acknowledged by the World Bank which presented several tools and practices based on which it concluded that;

"We do not offer these examples as perfect models of how, for example to plan a development project in a participatory manner. In fact, we believe that no perfect model" for participation exists. The form- participation takes is highly influenced by the overall circumstances and the unique social context in which action is being taken."

(World Bank Participation Source Book, 1996)

Confirming the above statement, different Best practices and guided steps of the P.P.P. are numerous, but those that could work for one place could not work for the other, and those which could work for one community could not work for another.

Furthermore, Current methods could hardly contain all community members in the participatory process. Needless to say, those qualified, trained, and active members need methods different from those who are far to reach, unwired, illiterate and poor.

So it is up to every case peculiarity that the methods are gathered from here and there, to form a guided path for what to do and how to do it. Difficult as it is for planners, it is quite challenging for local people to go through all of these methods and practices to search for the most appropriate to their case peculiarity.

b- Non-easy, time consuming applicability

Implementation of current methods is characterized as extremely difficult. Current methods are not easily applicable due to the intensive detailed work it requires. In fact, they face difficulty in application due to the following:

- High dependency on the face to face intervention or deliberation.
- Difficulty of orientation and training at different levels of participatory planning phases.
- Conventional methods of workshops and seminars. The training process assumes that every actor has to participate in a wide range of activities tackling simultaneously a set of problems some time conflicting with each other
- Difficulty of translating the planner's vision to concrete actions governed by clear set of bench marking. i.e. deskilling the planning capabilities
- Difficulty of data capturing and aggregation into major trends and indicators.

c- Participation Minimization

In contrast with the principles of P.P. previously mentioned, which considered equity, trust and diversity as success factors for PP, current methods failed to fulfill community's equity in containing all voices, and views and community's social diversity (the rich and the poor, the educated and the illiterate, the wired and the unwired, etc.). Obvious as it is through previous analysis of PP methods, and yet manifested bluntly through the clear declaration of some practioners and expert that participation had been minimized to surmount complexity;

"As such, Action Planning avoids maximizing information, co-ordination, integration and participation".

(Hamdi, 1997 P: 30)

d- High Dependency on Professionals and Donors

Based on actual experiences, Dependency on professionals and donors is not restricted to the financial and professional matters, but it also influences other PP functions. current methods urges their existence in every step, and makes applicability impossible without them. In many cases they may take decisions different than those of the community to achieve their own interests (publicity, less budgeting, quicker implementation).

Considering the World Bank as a major stakeholder in any projects that it finances, it reserves the upper hand right in all decisions taken for influential stakeholders.

Instead of triggering the developmental process, they are actually governing it. Such behavior by donors and professionals conflicts with PP bottom up approach.

e- Challenges of Public learning programs

It is a difficult job to identify "*who needs to learn what*". According to the World Bank, this quotation shows the difficulty in identifying community members' education level and interests and providing the equivalent appropriate education for each. Due to this difficulty, the world bank has gained insight to identify the reasons why a number of bank financed projects have run into so many problems. (World Bank Participation source Book (1996)

f- Moving down the ladder of participation

It is disappointing to see how applied PP diverged so much from its defined principles. With their admission that they had to move down the ladder of participation, the World Bank announced in its source book that they shifted *"Form popular to stakeholder participation"*

"When we began preparing the Sourcebook, we assumed we would be writing about "popular" participation, that is, participation of the poor and others who are disadvantaged in terms of wealth, education, ethnicity, or gender. It seemed obvious to us to focus on the participation of these poor and disadvantaged groups because, although often the intended beneficiaries, they are usually without voice in the development process.

(World Bank Participation source Book (1996) R: Chapter One P: 6.)

The World Bank highlighted the Stakeholders who have power and an influential voice in P.P. as follows: a- those directly affected by the project b- borrowing governments, c- NGOs and private sector, d- the Bank and its staff and shareholders!

Instead of enabling the poor to participate and take the upper hand in PP, the current applicability favored the powerful over the powerless. It is difficult to believe that working with powerful stakeholder would serve the need of the poor who are voiceless in the participation. Powerful stakeholders have their own needs which they will work hard to serve. Following are the reasons the World Bank stated for its moving down the ladder of participation.

"We also noted that, sponsors and designers of development activities had to work with and through powerful stakeholders to serve the needs of the poorest people. Attempts to bypass powerful stakeholders often resulted in opposition from them; this opposition usually compounded the problem of getting anything useful accomplished.

For these reasons, we shifted our focus from popular participation to stakeholder participation. This is a decision that we have made consciously and that will have important implications for the way the Bank works"

(World Bank Participation source Book (1996) R: Chapter One P: 6, 7)

1.4 Brief

Difficulties of PP applicability are highly interrelated. Those short comings showed the extent of the gap separating the actuality of implementation and the targeted objectives. One could say that while claiming a bottom up approach, the process has been once again retreated to some sort of a top-down approach.

Those short comings are due to lack of insight of PP problematic. They failed to assimilate the nature of PP and its inherent sources of difficulties. In other words they indulged in solution without clear identification of problem at hand.

Therefore there is an urgent need for another shift from the conventional participatory planning. A shift that would render the participatory planning more applicable and sustainable.

This proposed shift would be the third shift for the participatory planning.

Chapter two is a presentation of this proposed shift, its features and requirement.

Introduction

Chapter Two proposes the third paradigmatic shift that could help mend the gap between PP principles and its applications, exploring the difficulties and features of the third shift and concluding with identifying the problem space of the research.

Through reviewing its different methods, the applied PP, could be recognized more as a product oriented than a process oriented paradigm. Tailored to satisfy a specific case or a particular problem, PP methods yielded in helping communities solving particular problems, while showing little records of sustainability, capacity building and poor enablement.

Consequently, there is an urge for a new paradigm that deals with Participatory Planning as a process, and not as a project with time limit (*participatory process should not be a onetime experience. A critical challenge facing the Project is how to institutionalize this process.*—Asia Development Bank, 2005)- and budget, and bound with a specific product. This does not mean that a process had no products, but it should be more worried about enabling people to solve their problems, and take a larger responsibility in the community team work in a continuous and sustainable manner.

If communities are trained to perform PP functions with little or even without external help, have the capabilities of organizing themselves, have the learning techniques that help them build their own capacities and have the potential to play their fair and suitable role in the Participatory Planning, then Participatory Planning would come closer to fulfilling its aims and abiding to its principles. At this stage, PP would shift from being a product oriented to a process oriented one. This shift is what the researcher would refer to latter through the research as the Participatory Planning Process (PPP).

2.1 INVESTIGATING RESEARCH QUESTIONS

This section is seeking answers to the following research question:

How could “Level, Time and Outcome of Participation” affect the success of PPP?

Literature review is presented to identify what’s meant by level, time and outcome of participation and analyze their influence on the success of PPP.

2.1.1 LEVEL OF PARTICIPATION IN PPP

The level of participation in this context means the number of citizens taking part in PPP.

Public participation is a success when it involves the whole spectrum of the community, where the idea of affected parties is used to define “the public”. This idea is the foundation of democracy.

Current methods of PP don’t encourage maximizing participation, which renders the level of participation very low in most cases, in comparison to the affected parties.

The literature review indicates that it is very important to have representation for the spectrum of interested and affected parties and that, especially at the outset, it is important to identify all such parties in order to engage them.

The Committee on the Human Decision of Global Change (HDGC) analyzed the breadth of participation using various PPP methods, and categorized them under three types of participation; Information Exchange, Involvement and Engagement.

One very important and relevant conclusion of their study is that the breadth of public participation decreases when moving from information exchange to Involvement, and from the former to Engagement.

In addition, increasing the number of participants in a working group has an advantage not only of increasing participation, but a higher tendency in obtaining a balanced social representation and balanced forces between the rich and powerful.

"For example, individuals who know more of the arguments about a particular issue tend to be more influential regardless of the quality of their arguments. Those with higher occupational status and educational attainment tend to speak more and are more influential, even if their information is not more accurate than other group member. Individuals who focus on the merits of an issue tend to have more influence in a group, even though they are also less willing to change their views based on meritorious arguments. Second, persons who possess these resources are much more likely to be recruited to participate than are their less advantaged peers." (HDGC),2008

Format (Method) Type	Breadth of Public Participation
Information Exchange (used both to inform and consult) Includes public hearings, comment periods, scoping meetings, focus groups, workshops, open houses, and listening sessions	Open access; often oriented toward individual citizens, but often includes interest group representatives
Involvement Includes citizen panels, deliberative polling, charettes, some advisory committees, citizen juries, study groups, town meetings, future search conferences, and online deliberation	Predefined group selected to represent diverse perspectives; may include individual citizens or group representatives
Engagement (in both decision making and collaborative action) Includes joint fact-finding, policy dialogues, negotiated rulemaking, blue-ribbon commissions, summits, community partnerships, and co management of projects or programs	Predefined to represent interested groups, sometimes geographically defined in the cases of partnerships or co management of projects to include stakeholders with local knowledge
NOTE: it is not meant to imply that all the formats(methods) in the same row of the table are alike, but rather that they have more in common with each other than they do with formats(methods) described in other rows.	

Table 2-1: Classes of Participation Formats (methods) Often Used by Government Agencies
Source: (HDGC), 2009.

As stated before by Hamdi, 1997 (refer to chapter one) current practice, conventional PP is avoiding having a lot of participants in particular. Marginalizing this factor is due to the difficulties associated with it.










LEVELS of Participation	COMMUNITY ROLES	OUTSIDER ROLES
NONE	-	 SURROGATE
INDIRECT		<  ADVOCATE
CONSULTATIVE	INTEREST GROUP 	<  ADVOCATE
SHARED CONTROL	STAKEHOLDER 	=  STAKEHOLDER
FULL CONTROL	PRINCIPAL 	>  RESOURCE

Fig. 2-1: Roles of Community and Outsider related to levels of Participation
Source: Hamdi, 1997

Fig. 2-1 presents roles of community and outsider (presented in Governmental authorities and representatives) in accordance with sought levels of participation. Shared control was what Hamdi sought through methods like Community action Planning, Planning for Real and ZOPP. However, he mentioned the **Full control** as the “*Dream in Practice*”, where the community dominates and the outside practioner is a resource. This is

the complete empowerment of the community as he stated, but avoided as being slower and much more complex. Hamdi, (1997).

Conventional PP can't afford to maximize participation with its current methods and resources.

It is having great difficulty in resolving conflicts between various participants, so it uses what is called facilitator or mediator who is an outsider trained person (paid or volunteer) to resolve conflicts.

It is having great difficulty in funding the process, so it uses international enabling organizations like the UN-habitat, World Bank, GTZ, etc.

Professional are having a great difficulty in passing their experience to the citizens, a one they spent a lot of their life time learning and practicing to gain it, so they use that's called workshops and training centers to try to raise normal (most of the time under normal, like illiterates) human capabilities to take over the stick as Chambers mentioned in the first PP principle.

In some areas where PP had been performed, few numbers of citizens knew of its existence. This is obviously due to the little attention given to raising awareness of the targeted community.

Aside from transparency, awareness and motivation difficulties, there is yet another very important factor missing which is the commitment to a non-easy (a participant identifies and analyses lots of problems, prioritizes them, finds solutions and alternatives, calculates budgets, etc., and even sometimes has to take GIS courses!) and lengthy task (most probably around two weeks).

In brief, for PP to abide to previously mentioned principles (i.e. maximize participation) through current methods would lead to maximizing conflicts, cost, and time. Thus levels of participation are intentionally being kept low by all parties involved in PP due to the complexity of having it maximized.

Consequently, avoiding complexity of PP, leads to reducing the process and deviating it from its real targets and finally renders the process ineffective, reducing its benefits to its few numbers of participants.

If a higher level of participation is to be sought, higher level of complexity has to be confronted.

2.1.2 TIME OF PARTICIPATION

Time of participation is meant to represent the time of participation for each participant, and not the whole time of the process.

In the increasingly unpredictable changing environments and the nonlinearity of both the participatory Planning as a process and the society as the planners, time has become more crucial and one of the most influential factors of the success of PP.

Short feedback loops is a necessity when dynamic changing environment had accelerated and unpredictability had increased, making accurate and timely feedback more than ever vital for effective adaptive change.

Quick, accurate learning and action are also crucial for the success of PP. (Chambers, 1994)

“Time of participation” is highly interrelated with “level of participation”. The two of them are affecting each other in many ways, but in this section each is considered as one of the major issues affecting the success of PP, where each has its own factors affecting it.

Participatory Planning is a voluntary work which entails that community members put time and effort to solve community problems. For some, this could be seen as a job of a monk or nun in a church, a sheikh in a mosque, and a minority of philanthropists. In poor and developing countries, most people are struggling to feed their children; some of them might work two

shifts, trying to provide their families a decent life. Even employees in the governmental sector who probably finish work by noon, strive to find themselves other jobs in the private sector, (bus or taxi driver, shop keeper, etc.). Time consuming PP requires workshops, training courses, and long commitment making it very difficult for almost all varieties of people in any community to participate.

"Cutting time" is a challenge, and one of the main and most critical issues in raising the level of participation. Time consuming PP discourages a lot of people to take part in the process, while a fast and easy one is of much more attraction to the public.

The use of IT has been used in conventional PP as an effective mean to shorten time of participation, yet it served as an empowerment tool for the rich and wired, which even widened the "digital divide" between the wired and unwired participants.

The use of ICT is a necessity to shorten time of participation, but it has to be sought as a mean to solve problems of the poor and not the rich, which is a new the challenge for professionals.

2.1.3 OUTCOME OF PARTICIPATION

Conventional PP is targeting short term outcomes. These outcomes are merely solving problems of the community, those which had been distinguished by community members.

Product oriented PP even cares less about implementation of community plans. Added to the frustration of the community members to know their plans would never see the light, conventional PP fails to put a foundation for any further continuity. Sometimes conventional PP leaves a negative influence among community members, for which most of them would feel reluctant to participate once more.

On the other hand, process oriented PP is targeting long term outcomes. The long term outcomes of PPP aim at the sustainability of the process. Its benefits lie further behind the physical and individual scope, to the institutional and group one.

- 1- Enabling the community to solve any problem,
- 2- Building leadership and citizenship, and most of all,
- 3- Institutionalizing the process to ensure its sustainability are all long term benefits and fundamentals of any PP taking part in a community.

It should ensure a mechanism of how to motivate public, how to collaboratively collect data, how to analyze it, and most of all how to monitor and evaluate community work and decisions. Its interests even stretch to raising funds, and how to communicate internally within community members, and externally with governmental agencies and other communities. If these fundamentals are established, it is easy to perform the process to solve any problem, and at the same time reach to the level of implementation. It builds up on the community trust and raises level of participation.

2.2 DOMINANT FEATURES OF PPP

This section discusses the transfer from the product oriented PP to the process oriented PPP. To seek such a transfer two main dominant features of the sought PPP has to be further analyzed. These features are; Multidisciplinary, and complexity.

“Human society is a complex non equilibrium system that changes and develops constantly. Complexity, multi variability, and contradictoriness of social evolution lead researchers to a logical conclusion that any simplification, reduction, or neglect of the multiplicity of factors leads inevitably to the multiplication of error and to significant misunderstanding of the processes under study.”

(Korotayev A. et al. 2006)

The first feature recognizes that PPP is a one with multidisciplinary aspects.

It seeks to perform planning tasks. Its planning aspect is a leading one. These planning tasks are done by the society with its various interests, ages, educational background, etc., so it has a strong social aspect. Its backbone is the information transfer between society members, so informational aspect is a key one in its success. Each of these aspects- if taken into consideration in analysis- would help transfer PP to PPP.

The second feature recognizes that PPP is a one with high complexity. This complexity was previously faced by the conventional PP with ignorance and reduction. Complexity of PPP, if acknowledged, celebrated and confronted would yield in a much more successful, non-reductionist and rich sustainable process.

A detailed discussion of these two features is presented in sections 2.2.1, 2.2.2.

2.2.1 MULTIDISCIPLINARY ASPECTS OF PPP

In this section Multidisciplinary aspects of PPP are studied in relevance with the success criteria of PPP. Each of the PPP aspects stated earlier has their effect on level, time and outcome of participation. Table 2-1 shows that the study of each aspect will help identify several factors affecting the success of PPP.

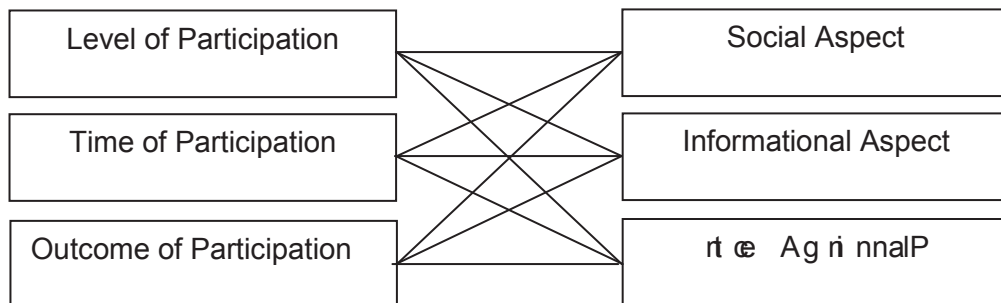


Fig.2-2: success criteria of PPP from multidisciplinary aspects
Source: researcher

The following section would present challenges of PPP from the three studied aspects and the factors affecting the success of PPP from each aspect.

2.2.1.1 Challenges of PPP form a Planning Aspect

Planning practice has never been an easy task for planners themselves. It is a task that needs learning, and experience for those who perform it. Giving the public the right to plan their own communities in a participatory process adds up to the difficulty of the planning process, where the spirit of

participation is missing in some of the communities, added to the lack of experience, lack of basic and formal education, (Increase in the percentage of illiteracy especially in developing countries) and adequate methods of performing PP.

In fact turning the society as a key performer and a decision maker in PP makes it a very difficult and different job.

For example some of the apparent differences between Planners and Society as a performer of the process:

- While Planners in general could be regarded more or less as one homogenous group of people, the society is more or less far more diversified.

- Professional planners are so familiar with planning steps and experienced in performing the process while society is completely unfamiliar with the condemned steps added to the wide range of diversified educational backgrounds or even illiteracy that prevails in most of the societies where PP is being performed.

- The number of planners performing the process is countable and individually known, while the society's number varies and in the case of the proposed PPP is preferably a big number.

- Planners have their materialistic motivation and short term interests that keeps them dedicated and committed to the planning job, while the society has non-materialistic motivation and most probably long term interests that turns quite a big percent of them either passive or reluctant to participate.

All of the above mentioned difficulties has to be faced in the third paradigm shift with new methods, tools and factors.

From the planning aspect there are some factors affecting the success of PPP as shown in table.

Table 2-2: Planning factors affecting success criteria of PPP.

Source: researcher

Planning Factors affecting	Level of Participation	Dependency	Ease of practice
	Time of Participation	Tasks per person	Learning process
	Outcome of Participation	Sustainability	

Dependency

The third paradigmatic shift calls for viewing the Participatory Planning from the planner's social point of view. It is not calling for the end of the planner, where the society would be the one in charge, on the contrary! It calls for planner's vision to distinguish what the society needs to know about planning, and how to transfer this knowledge in a simple, practical and diversified comprehensible language.

The higher the dependency of the process on the donor and organizer, the less successful it is.

Ease of Practice

Participatory Community planning differs from conventional planning done by professional planners. Community planning is simple and small parts of the planning steps done by individuals of the community by different means, if agglomerated and converged in the right direction would end up in a magnificent collaborative work.

The real challenge is how to turn a difficult job into an easily comprehensible step by step planning; *“The challenge is to make it easier for poor women and men to participate actively in planning, monitoring, and evaluating development projects that touch their lives in very real ways”* (Asian Development Bank, 2005) and how to collect bits and pieces of work into a comprehensive and coherent whole.

Tasks per Participant

Planning tasks if distributed over small number of participants would lead to long time of participation for each participant. Lengthy and time consuming participation is not practical and inconvenient for majority of people.

On the other hand, reducing planning tasks per participant would lead to decreasing the time each participant has to spend in voluntary participatory work. This in turn would lead to increasing number of participants and collectively having a shorter time of participation.

Participatory Planning is a Learning Process

Non-formal education which depends on Excessive courses of participation through workshops used in conventional participatory planning is not suitable for community members. It should be rather directed towards community leaders and NGOs. These workshops are both time consuming, (where in most cases it takes from two to three weeks, four to eight hours a day), and difficult for common street person to understand, in addition it

requires high levels of commitment from participants. The normal education provided by these workshops could be summarized in the following points (UNESCO 2001):

- Participatory Education Planning
- Community Participation and social mobilization
- Competency bases learning assessment

Such manuals if given to NGOs through regular and continuous manner, would give them the ability to lead PPP in an independent manner and a sustainable cycle.

Little attention has been given to targeting common street person.

A non-formal and indirect kind of education should be considered to engage society in a self-learning participatory education. If PPP is a learning process, society achievements are expected to improve in a steady slowly manner as long as this education is indiscrete and dynamically improving according to the societies levels of participatory comprehension.

Sustainable PPP (mentioned before in Outcome of Participation)

2:2:1:2 Challenges of PPP Informational Aspect

PPP is a one in which information plays a major role. Some went to the extent of viewing PPP as a series of information exchange. Dandekar suggests that involvement of the public to stimulate good ideas and build a consensus amongst a diverse community is a mere process of information exchange, that follows the following steps;

- *presentation of information to the public;*
- *receipt of information from the public;*

- *exchange of ideas and opinions that build upon shared information as the ideas evolve*

(Dandekar 1982, P: 131)

Moreover, Participatory Planning , from Anderson’s point of view, is a one in which the public is stimulated to come up with good ideas and build a consensus amongst a diverse community to satisfy the following targets:

- 1- *Stimulates local people to come up with good, workable ideas;*
- 2- *Develops a broad consensus; and*
3. *Uses to good advantage the professional skills of the local planning staff or consultants.*

(Anderson 1995 P: 36)

Crucial and dominant as it is, the information issue is a one on which success of PPP greatly depends.

Analyzing challenges of PPP from an informational aspect requires the discussion of several factors that affect information.

Transparency, updating, dissemination, agglomeration, Knowledge, technology and marginalization /empowerment, are all factors affecting the information aspect of PPP. (see table 2-2)

Table 2-3: Informational factors affecting success of PPP.

Source: researcher

Informational Factors affecting		
Level of Participation	Time of Participation	Outcome of Participation
Awareness	Acquiring and Updating Information	Collaborative information system
Transparency of Information	Problem-solution Data bank	Knowledge engineering process
Interface	IT; empowering (Learning tools)	Community networking

Awareness

When the main target is increasing the number of participants, there are two kinds of awareness; awareness of the existence of a participatory planning in the local area, and awareness of its importance and positive impacts of participatory planning, individually (benefits of participation on the personal level) and collectively (benefits of participation on the community level). To raise level of awareness several advertising tools and formats are required to reach to all social categories in the community.

Insuring Transparency of information

Transparency of information ensures equity between participants, build trust between the government and the people. It also helps PPP in satisfying its aims and targets of increasing the breadth of participation and enriching the outcomes of the process.

How to leverage Information transparency is a crucial factor for the success of PPP The International Budget Partnership (IBP) has done several serious efforts to try to record transparency, especially that related to budget which help reform ways to increase transparency. (IBP) reported in its open Budget Survey, 2008, how the lack of transparency could negatively affect participation and public decision making;

"The Open Budget Survey 2008 finds that, overall, the state of budget transparency around the world is deplorable. In most of the countries surveyed the public does not have access to the comprehensive and timely information needed to participate meaningfully in the budget process and to hold government to account. This lack of transparency encourages inappropriate, wasteful, and corrupt spending and—because it shuts the public out of decision making—reduces the legitimacy and impact of anti-poverty initiatives."

(IBP, 2008)

Acquiring and Updating Information

Information acquisition and updating is a great burden on planners shoulders, added to the high expenses it requires and the great effort it takes. Putting plans on the base of old information renders the whole plan un-equivalent to solving the problem at hand, and the decision taken to deviate from the aims it was meant to target.

The cost also plays a great role in data acquisition and updating;

"A very important issue is the cost of data acquisition. For any geographical information system, generally speaking the cost of data amounts to five to ten times the price of hardware, software, org-ware, staff training and maintenance"

(Laurini, 2001, P:70)

One has to be very cautious what sort of data is needed to avoid collecting unnecessary data that would increase the cost and form a kind of over-information burden on the participants. Also finding an inexpensive, easy way of acquiring and updating information is an important factor that affects the success of PPP.

Interface

Information dissemination is the input of information to the society. This input could have different aims like; raising awareness, raising capabilities, informal learning of the participants, forming a data base about a problem, data exchange (exchange of ideas) among participants.

Information Technology (IT) has proved to be crucial as a mode of communication and visualization in PPP. It is therefore the modern delivery system for communication of information. Shiffer (1996) writes,

"Information is only powerful when it is effectively comprehended by those who use it. IT can help people to comprehend information, (thereby delivering knowledge)."

If this input does not have different forms, (from written formats, to voice formats, to picture formats, and 3d formats), then people's comprehension of this input would be questionable. Accordingly, the input format should have the flexibility to suit the nature of information and the nature of the recipient. The crucial thing about this format is that it has to be comprehensible to the participant and sufficient to fulfill the requirement of its sender.

Nevertheless, data collected from local people should be of various formats. This is due to various education levels of participants and various nature of information. When reducing formats of getting data from participants into one or two, this would indeed have a negative effect on the variety, quantity and sufficiency of information.

Problem Solution Data Bank

Best practices, common problems, well known solution, relevant examples are all very helpful ways to guide communities and enlighten participants of how to solve their problems. This does not reduce each case studies peculiarity; it rather cuts time short when searching for a solution, where a hybrid solution could most commonly come from combining more than one solution into a suitable one for a local problem.

If information technology could help form this kind of data bank, and present it to the participants in a multi format output, it could save a lot of time and help shorten time of participation.

IT: From Marginalizing to Empowering (Learning Tools)

The numerous and various differences between traditional and participatory planning force us to look differently at the IT and at the hopes and expectations held on it in solving problems. This is simply because, IT in traditional planning is solving problems facing professional planners, while in participatory planning IT should be solving problems facing whole range of diversified groups within society.

The difference between planners and society as users of the IT is one of the major reasons forcing us to think different of IT when talking about PPP.

IT has been used as a very useful tool in the field of P.P. for example; practices of the participatory planning GIS (PPGIS) and distributed geographic information (DGI), proved to be very useful tools in PP, where they empower those participants who are wired and educated to a great extent.

"Participatory GIS is the result of a spontaneous merger of Participatory Learning and Action (PLA) methods with Geographic Information Technologies and Systems (GIT&S) to compose peoples' spatial knowledge in the forms of virtual or physical, 2 or 3 dimensional maps used as interactive vehicles for discussion, information exchange, analysis and as support in advocacy, decision making and action taking. PGIS practice is usually geared towards community empowerment through measured, demand-driven, user-friendly and integrated applications of GIT&S, where maps become a major conduit in the process".

(iapad, 2010)

Yet they are questioned to be one of the reasons behind marginalizing the poor and illiterate sector of the community. Howard, 1998.

Borrowing solutions tailored for planners (like the GIS) and forcing it in the current form in the Participatory Planning is unpractical, and it helps widen the digital divide in the community.

Enabling the poor and the wide variety of the community to make good use of the IT would empower them and render them more capable of handling their own problems and handling the whole process themselves.

Ken Snyder, 2005, Director for PlaceMatters.com,¹ argues that improvement in planning can only come from bringing democracy and accessible technology into the decision-making process. His trial was to stress the fact that involving the public in planning and getting people (even hundreds of diverse people) to show up to a meeting does not necessarily improve the planning process or planning outcomes, except when the public involved are empowered with all technical means to confirm the reliability and viability of the participatory planning results.

He highlighted two important actions to be taken in the way of reforming the traditional way of top-down planning:

- *commit to the notion that democracy in planning is worth improving, and*
- *take advantage of a variety of communication, visualization, mapping and impact analysis tools to make it happen.*

(Ken Snyder, 2005)

The challenge is how to tailor IT to serve the community needs, i.e. easily comprehensible, applicable, cheap and practical IT, to serve the poor and the wide range of social varieties.

¹ A national organization working to engage communities in democratic, holistic and place-based planning

Community networking

Community networking is the infrastructure of PPP. This network if established would enable community members to communicate and exchange information with all its various formats, both synchronal and asynchronous.

All means of communication should be incorporated in the community network to ensure social convenience according to wealth, culture, education and electronic connectivity.

Such a community network is an essentiality for a collaborative information system, which updates itself dynamically depending on local resources of community members.

Collaborative information system

A Collaborative Information system is a one which has various information data bases, from Governments, national and international institutions, NGOs, public and private sector, collaboratively collected in one coherent whole. According to UN Agenda 21 (1992), that such an information system would requires,

- strengthening coordination between existing sectoral data systems,
- strengthening national capacity to gather and access data,
- provide the appropriate technical information necessary for informed decision-making
- Support for low-cost, community-managed systems for the collection of comparable information.

Transforming Information to knowledge (Knowledge Engineering)

Earlier Lewis Thomas, 1978, highlighted the problem of dealing with information saying:

“The trouble is that the flow of information is mostly one way. We are all obsessed by the need to feed information in, as fast as we can, but we lack sensing mechanisms for getting anything back”.

Therefore, this information is useless, except when it is transformed into knowledge.

“In the mantra of information science, data must become information, information must become knowledge. Knowledge must be translated into decision support’s informing choices.”

(Barndt, 1998)

In PPP, knowledge is concerned about what counts and what does not, what is relevant and what is not.

When information is collected by planners following the top down hierarchy, meaning following the governmental chain of ministries, governorates, local authority central government, local popular council, hardly could it present knowledge for local people who participate in PPP.

Information coming the other way round, following the bottom up paradigm is in itself the local knowledge of people in the community. It has intimate relevance with the problems they face every day, and it counts in the decision making and plans to confront the problem.

This doesn't mean that there is no need for information coming from higher authorities; it rather renders them as followers of the local knowledge emerging from the community. Local knowledge directs the path of what counts and what does not and what is relevant and what is not.

Depending on Local knowledge as the bases of data banks would help participants from drowning in the over information presented by top-down authorities

2.2.1.3 Challenges of PPP from the Social Aspect

Since PPP gives public the right to take the stick in their hands and to govern the whole process, social challenges of the communities arise.

From social aspect many variables might have an effect on the success of PPP, such as social exclusion, social coherence, motivation, commitment, technophobia, public acceptance and social organization.

Table 2-4: social factors affecting success of PPP

Source: researcher

Social Factors affecting		
Level of Participation	Time of Participation	Outcome of Participation
Motivation	Commitment	Social organization
Social exclusion	Technophobia	resources of PPP
Social cohesion		Wide public acceptance
Transparency/ trust		

Motivation

Motivation is a key factor in acquiring a high level of participation from community members and its sustainability is a key factor in the sustainability of PPP.

"The word "motivation" indicates the willingness to work, or to get something done. The meaning has been corrupted when someone says she or he wants to be "motivated," meaning that he or she wants payment. Cash is only one possible factor of motivation. People can be motivated to do things on the basis of loyalty, or of love of person, family, lineage, tribe or country. Someone may be motivated to do things because they want to see the results (job satisfaction). Motivation is the desire to act, not the payment".

(Bartle, 1998)

Motivation of the public to participate in PPP deeply depends on the relevance of the issues (that PPP is tackling) to the targeted individual and the benefits (physical and direct, to non-physical and indirect) that this individual would gain from participation. Therefore motivation should have various means equivalent to the various perspectives of the targeted individuals.

Motivating various citizens -with various interests and needs- to participate needs a new perspective than the conventional one. For example, motivating poor citizens needs an approach -which goes down to them, speaking the same language and sharing the same aspirations- of direct and very short term benefits. Individuals of poor societies don't think of the environment, neither do they understand development. According to Maslow's² hierarchy of human needs, (see fig.2-3) satisfying basic needs from food, water, sexual activity and shelter, form the bottom base of the pyramid of human needs. One does not feel the second need until the demands of the first have been satisfied, nor the third until the second has been satisfied, and so on. Needs like problem solving and creativity form the top of Maslow's pyramid. Maslow's pyramid is an indication of how to approach and motivate people to participate according to their needs.

Accordingly, the social analysis is a key factor in triggering the society's needs and interests that would help assess the means and tools by which people could be motivated to participate.

From the social aspect, there are several variables affecting success of PPP as follows;

² Abraham Harold Maslow -April 1, 1908 – June 8, 1970- was an American psychologist. He is noted for his conceptualization of a "hierarchy of human needs", and is considered the founder of humanistic psychology.

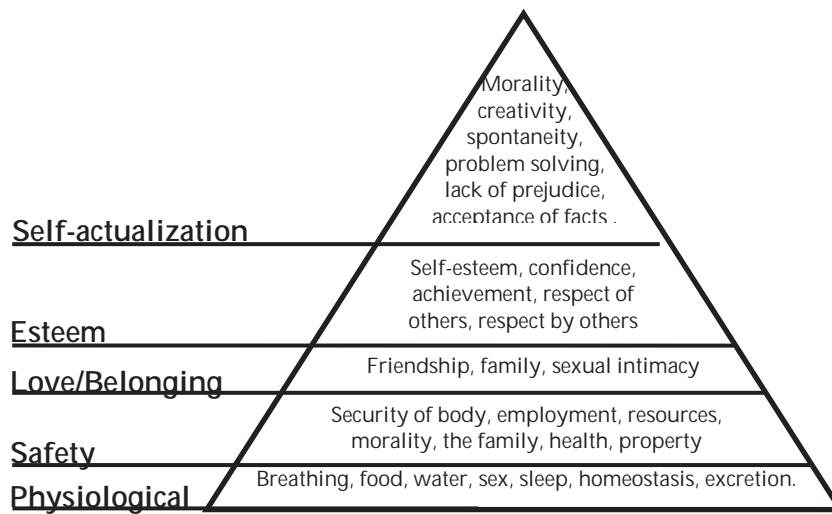


Fig.2-3: An interpretation of Maslow's hierarchy of needs, represented as a pyramid with the more basic needs at the bottom.

Source: Janet et al, 1987

Social Exclusion

Social exclusion is a manifestation of social inequality that goes along with persistent high unemployment rates and increasing poverty. Consequently, high levels of social exclusion provide a multidimensional and dynamic perspective of the resultant weakened possibilities to participate in social life. Petra Böhnke.

In principle, social exclusion can be related to any lack of essentials in the domain of daily life, be it income, employment, housing, education, social networks, health etc.

“Where citizens are unable to secure their social rights, they will tend to suffer processes of generalized and persisting disadvantage and their social and occupational participation will be undermined. It is therefore necessary also to examine patterns and processes of generalized disadvantage in terms of education, training, employment, housing, financial resources, and so on: in short, disparities in the distribution of life chances”

(Room 1998 P: 291)

As indicated, several factors affect the success of PPP from the social aspect. Poverty, Education and Employment are three main factors that could have great influence on social exclusion in general and on the participation specifically.

-Poverty

Poverty is in the heart of social exclusion. As a social problem it is a deeply embedded wound that permeates every dimension of culture and society. It includes sustained low levels of income for members of a community. It includes a lack of access to services like education, markets, health care, lack of decision making ability, and lack of communal facilities like water, sanitation, roads, transportation, and communications.

Poverty has a negative effect on the level of participation. A poor citizen would hardly think of participating in any community development or actions when he has to think daily of means to feed his hungry children. Taking about participation as means of eradicating poverty is only one way to look at the situation, when poverty is an obstacle in the participation process.

"The poor face a special challenge in their effort to participate in economic development. Unlike other citizens, they often lack the time, ability, or access required to articulate their interests. They spend their resources meeting their basic needs for food, shelter and clothing. They spend their time seeking access to goods and services that others obtain far more easily, such as education, credit, health services, physical safety and property rights."

(UN-habitat, 1996)

-Illiteracy

High levels of illiteracy might have a negative effect on participation. The experience of formal schooling is the key factor in transforming self-images whereby one tends to view the world as an actor than a spectator.

Communities where there is reluctance to educate girls and consequently low levels of schooling might have a negative effect on participation.

"From a sociological perspective, schooling is a learning experience in a much broader sense than in terms of exposure to a formal curriculum. The children also acquire social skills, such as functioning in a group other than that of a family or kin, and observe codes and practices governing behavior when interacting with others, such as teachers and fellow students, in distinct non-formal roles."

(Tecke et al, 1994)

-Employment and income

Employment and job security promise an income to satisfy basic needs and provide social integration and social identity at the same time.

The Human Development Report uses the long-term unemployment rate as a proxy for social exclusion in its construction of the Human Poverty index for industrialized countries. (UNDP, 2000).

"Employment and job security promise an income to satisfy basic needs and provide social integration and social identity at the same time."

The hypothesis underlying the approach is that the interdependence of social disadvantages and weak labor market attachment is key to the vicious cycle primarily responsible for social exclusion".

(Petra Böhnke P:6)

Highly educated, financially comfortable people are much more likely to be active in public affairs than are less educated, lower income people, not

because they are more concerned about public matters or more willing to make the effort, but rather because of differences in the control of politically valuable resources (cognitive skills, money, and a sense of political efficacy), embedded-ness in social networks that include influential people, and the targeted efforts of political organizations to activate the citizens who control those resources. (HDGC, 2008).

On the other hand, there are other opinions that the lower the income, and the social class the higher the participation would be. Hamdi, 1997. Through this vision, Hamdi and Goethert, 1997, identified three types of participation; the ideal one or the highest in participation levels, in which the poor are the most involved as they have the most to gain from any proposed involvement, and the reluctant one, or the least in participation are the higher income communities, which have little to gain from involvement since they have access to political power.

Social Cohesion

Social cohesion is the strength of the relation interaction and ties. Social cohesion would affect whether community members would work together successfully or unsuccessfully.

Social cohesion affects PPP directly in multi supportive ways. Homogenous society tends to have common dreams and targets, common interests, most probably having the same cultural and social backgrounds, and economic standard.

On the other hand, social heterogeneity has a negative impact on PPP.

Communities could suffer from Social heterogeneity for many reasons and in many shapes, for example: Religious struggles, cultural diversity, transitory or stepping stone-communities as Hamdi, 1997, identified them as

those communities that contain old timers and new comers , or those going through a class turn-over from middle income to upper income for example.

Commitment

Commitment is putting enough time and effort to get a job done or a target achieved according to a schedule. Commitment is highly related to other factors previously mentioned like social exclusion, education and employment.

Social commitment to perform PPP is variable. It is not easy to achieve high records of commitment is a voluntary work. Some participants (as will be mentioned later in the case study of Manshiet Nasser) would participate only if there is a reward whether materialistic, or even advantages. (Payment, a job, a prize, praise, etc.). the way PPP is currently performed makes it even harder for participants to commit themselves to it. Long workshops, small number of participants, lectures given by professional are all very demanding jobs for volunteers.

Technophobia

Introducing IT means to facilitate PPP functions, shorten time taken, and increase number of participants is a double edged weapon, where most communities performing PPP record high in illiteracy in general and computer illiteracy in specific.

"Technophobia is the fear or dislike of advanced technology or complex devices, especially computers. The term is generally used in the sense of an irrational fear, but others contend fears are justified. First receiving widespread notice during the Industrial Revolution, technophobia has been observed to affect various societies and communities throughout the world. In some of these cases, the new technologies conflict with established beliefs, such as personal values in simplicity and modest lifestyles."

(Wikipedia Encyclopedia, 2010)

Social organization

Organizing the community into focus groups, or work groups according to topics of interests, and at the same time balancing the capabilities of each workgroup to ensure sufficiency representation, adequacy of representation and equivalence of tools, training and support of professionals to the problem at hand, all come under the challenges of social organization.

Being a no easy task, social organization faces many problems itself, like inadequacy of representation, social disparities, conflicts, reluctant groups.

Inadequate representation of interested and affected parties is one of the leading criticisms of PP. Achieving full participation by interested and affected parties can require substantial diligence.

Resources of PPP

Outcomes of PPP as plans and strategies need resources to see the light and their way to execution. Governmental budgets, fund (either from local donors, NGOs, and international agencies) and participatory collective resources play an important role in the success of PPP outcomes. If resources where not planned for form the beginning of the process, participatory planning would not exceed paper works. This actually happened a lot, and it causes people mistrust and frustration.

Public acceptance

The consensus conclusion of research on PPP (such as public hearings and citizen advisory committees) and on public participation in governance more generally is that the vast majority of the public is uninvolved in, or even unaware of, participatory options that are, in principle at least, available to them (HDGC), 2008.

Excluding large number of citizens from participation and even from voting on the condemned plans and strategies reduces PPP and even questions if it is that planning was participatory in the first place.

2.2.2 COMPLEXITY OF PPP

Previous argument reveals that PPP is a complex process par excellence. Generally this fact was previously acknowledged by pioneers, like Jane Jacobs, and Michael Batty, that cities and planning is not an easy task, and that their problems and changes are making them even more complicated; Jane Jacobs (1961: 433) emphasized the complexity of cities.

"problems in organized complexity [...] They present situations in which a half-dozen quantities are all varying simultaneously and in subtly interconnected ways.

Cities [...] do not exhibit one problem in organized complexity, which if understood explains all. They can be analyzed into many such problems or segments which [...] are also related with one another."

While Batty (2005) writes that

"[systems of cities are no longer thought as being "complicated" but rather "complex", in that there is always uncertainty about the outcome of the processes of change that originate from the bottom up. This is what we mean by "complexity".

Further he writes in a later article (Batty 2008), that

"cities are the example par excellence of complex systems", as they are "emergent, far from equilibrium, requiring enormous energies to maintain themselves, displaying patterns of inequality ...".

The specific complexity could be deduced from the definition of PPP and from the previous feature; PPP a multi-disciplinary field of research. This complexity could be seen in the following points;

- Participatory planning is a set of processes (multi-functional), and not one process.

- The challenges arising from having different parties involved in PPP, for example;
 - Conflict in interests and the impact of this conflict on the organization and management of the development process
 - Different educational backgrounds (ranging from illiteracy to professionals and consultants)
 - Large numbers makes it hard to gather in one place, work in organized groups, listen to everybody's viewpoint, and communicate in an efficient and fast way to exchange information.

-The information exchange which is one of the main and most important issues about this definition, nevertheless, the various kinds, levels, channels, scale, accessibility and authority given to this information, and the way it could be transformed to a useful knowledge to the participants.

2.3 Brief

The third paradigmatic shift as it solves a lot of participatory planning problems; it initiates a lot of problems itself. These problems are presented in the multidisciplinary aspects and the complexity of PPP according to each of those aspects.

If this shift is to confront all mentioned problems of PPP, then it needs a new way of tackling problems.

The problem space of the third shift is illustrated in fig. 2-3 where the two features of the third paradigm shift; multidisciplinary aspects and complexity are shown as; social complexity, informational complexity, and planning complexity.

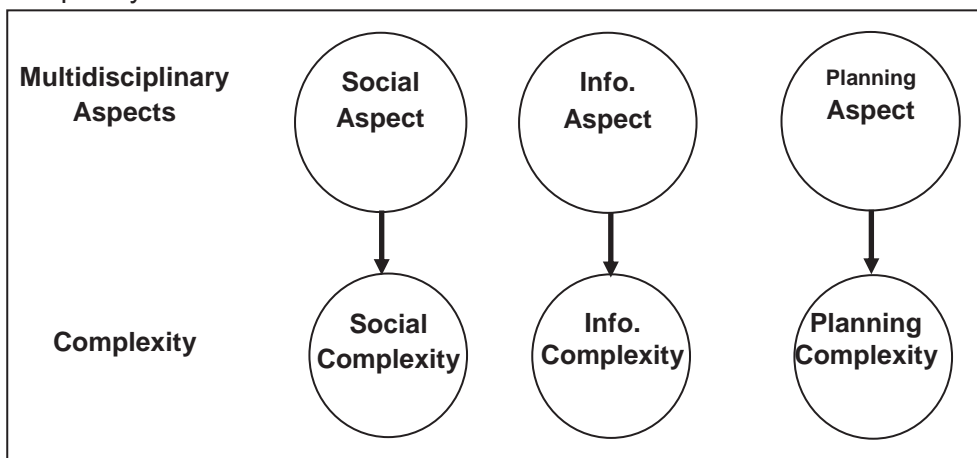


Fig.2-4: Problem Space
Source: researcher

This chapter gives way to threads of analysis:

-The first thread is the analysis of PPP complexity from the three studied aspects. Investigation of applied methods in dealing with complexity through literature review of complexity science and cybernetics is required to investigate possible solutions for PPP complexities. Chapter three presents such investigations.

-The second thread is the investigation of the factors affecting success of PPP from multidisciplinary aspects in local Egyptian case studies. This analysis is presented in chapter five.

Introduction

PPP is a process of high complexity as defined by the proposed third paradigm shift. Complexity of PPP has multidisciplinary aspects as well. This chapter analyzes the many features of PPP complexity, and then seeks solutions from Complexity Science and Cybernetics.

Complexity Science has led scientists to understand how complex systems and phenomena work, and how to deduce solutions from natural and biological complexity.

Consequently, exploring complexity science in general, its definitions, roots, progress could lead to threads of clarification -from various fields- on what the solution space (to our previously mentioned problem space in chapter two) might look like.

Complexity theory is the interaction of its three roots; Cybernetics, System Dynamics and General Systems theory (theoretical biology). (Abraham, 2002). (Each of them would be defined and clarified later in this chapter). While Complexity science took a long journey across the development path to reach to the recent studies of Dynamic Network Analysis in Social Science, Cybernetics took another parallel path of development to reach to what is now known as the Multi-Agent Modeling.

Chapter three is divided into three sections;

3.1 presents an analysis of the problem space of the PPP, identified earlier in chapter two, from multidisciplinary aspects; Planning, Informational and Social.

3.2 clarifies the need for **Modeling** to face complexity of PPP, and nature of the required model to face previously analyzed complexities.

3.3 explores solutions offered by complexity science and cybernetics through the presentation of their development in general, and how each of them could reflect solutions to the PPP problem space.

3.1 COMPLEXITY OF PPP FROM MULTIDISCIPLINARY ASPECTS

The third proposed paradigm presents a new vision of dealing with complexity of PPP this vision could be summarized as follows:

- a- Understands complexity; kinds of Complexities of PPP from multidisciplinary
- b- Decompose it into smaller less complex sub-parts, rather than simplifying it in a reductionist way.
- c- Faces complexity of PPP with new methods and tools tailored to its problems, and not by the same methods and solutions that were used with the conventional participatory planning.

To understand PPP complexity, there are three sets of Complexities, as identified by Ali Nabil, 2005; Complexity as a general term, complexity of information and complexity of communities (from an Arabic social perspective). These sets of complexities are illustrated in the matrix below:

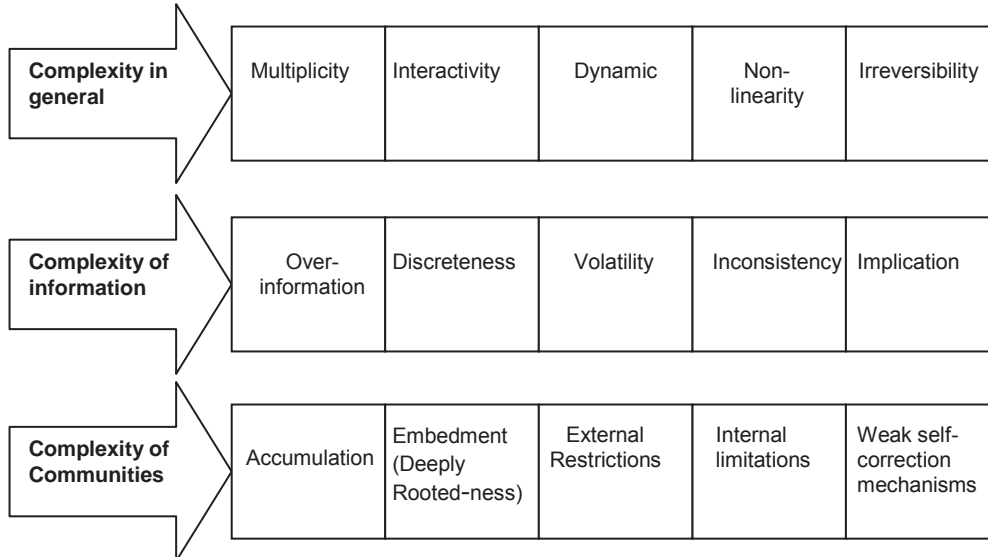


Fig. 3-1: Complexity matrix
Source: Adopted form Ali Nabil, 2005.

The researcher would adopt this matrix as a start point to co-ordinate between:

- Complexity in general and that of PPP
- Complexity of information in general, and that of the information involved in PPP ; and
- Complexity of communities and the social complexity of the communities where PPP is being applied.

3.1.1 COMPLEXITY OF PPP: PLANNING ASPECT

The complexity of PPP comes from a set of features that are acquainted with it. First; multiplicity of entities, aspects, actors, environments and steps, second; the dynamism which considers the time as a major factor affecting all aspects of the process, third and fourth are the non-linearity and irreversibility nature of the process. Each of these features of planning complexity is explained as follows:

Multiplicity:

- Multiple entities involved in PPP, presented in the form of communities/interest groups/individuals, local politicians as well as technical staff of local governments, service providers including national and provincial Departments and non-governmental organizations (NGOs).
- Multiple aspects with which PPP is concerned. (Social, economic and environmental aspects).
- Multiple backgrounds of participants involved in PPP (educational, cultural,,,))
- Multiple environments in which PPP is taking place. (Urban – rural).
- Multiple functional steps of PPP were it is a set of many process; (see chapter one for PP steps)

Interactivity:

PPP is greatly dependent on the interaction between participants while exchanging information and knowledge, and building consensus over the action plan of their communities. The most important channel of interactivity is the feedback, which is the most important constituent of the characteristic of self-correction of PPP.

Dynamics:

PPP is a dynamic process, where it faces socio-economic and environmental changes along with the change in time. These changes could range from simple and expected changes, to rough and sudden ones.

Non-linearity:

PPP is a non-linear process where it takes different courses of actions in different setting. If repeated in different communities, its behavior and results can never be expectedly the same.

Irreversibility:

PPP is an irreversible process. While linear process could get back to its initial state after removing all external forces with equal and opposite forces, complex processes like PPP could never get back to its initial state. This could be illustrated when undergoing PPP with inequity and corruption forces (from both within the community and outside it). If these forces were removed with equity and transparency, PPP could never go back to its initial state, for there would be layers of mistrust that could never be removed easily.

3.1.2 COMPLEXITY OF INFORMATION: INFORMATION ASPECT

The complexity of PPP from an information aspect comes from a set of features that are acquainted with it. These features form a challenge to handling information exchange in PPP. First feature; over-information, second; fragmentation, third; volatility, fourth; inconsistency and fifth; implication. Each is explained as follows:

Over information:

The development process which PPP is seeking is a multi-process one which has three aspects; economic- environmental- social. In order to be able to build consensuses for the new development, huge amount of information is presented to stakeholders/participants involved in the decision-making process. This results in the first problem which is “Over information”. In addition, quality of information forms the second problem, where information presented should be up-dated and relevant to the problem at hand. Challenge of information lies in finding means to protect participants from drowning in the overflow of information and selecting information needed for each phase of the process for specific work groups or participants.

Fragmentation:

Discreteness of information originates from the various and variable sources of information (information from government sources, community sources, organizations sources...). Here appears the role of technical systems in collecting discrete information in a linguistically cohesive and logically coherent whole.

Volatility:

Information has a very short life time. This means it is greatly liable to being lost if not properly archived. Here appears the need for a self-achieving system for the important information so as not to get lost by time.

Inconsistency:

Discrete Information is liable to being inconsistent both in shape and content. This complexity needs a technical mechanism for standardization.

Implication:

This characteristic might occur due to the different understandings of the participants to given information. This is quite normal where our human comprehension of the same information could probably be different.

3.1.3 COMPLEXITY OF COMMUNITIES: SOCIAL ASPECT

The complexity of PPP from social aspect comes from a set of features that are acquainted with it. First; accumulation, second; embedment, third; external restrictions, fourth; internal limitations and fifth; weak self-correction. Each is explained as follows:

Accumulation:

The problems of communities that PPP is facing might be complex and difficult to solve, but it gets more complicated when it accumulates over time with ignorance and the lack of solutions or actions. –Slums” are good examples for accumulation, where they originate as a result of problems which were ignored or not solved, to grow and surrender metropolises with endless poverty rings. Un-slumming slums is now like untangling a ball of tangled threads. Accumulation makes it even harder to distinguish between cause and effect, which might lead to uncertainly in providing solutions.

Embedment (Deeply rooted ness):

Problems of communities that PPP is facing could be deeply rooted in the society, which makes it a complicated task to overcome it. A good example for the –embedment” is the passive and non-participatory behavior in some of the bureaucratic communities.

External restrictions:

Some of the complexities of communities results from external restrictions like legislations and hierarchal top-down governmental agencies, which

forces decisions at the local level to be more like a reaction rather than actions

Inherent limitations:

Some of the complexities of communities results from internal limitations whether economic, social, or environmental (e.g.: lack of resources, weak women representation, high levels of illiteracy, natural barriers). This in turn results in the slow reaction of problem solving.

Weak-self-correction mechanisms:

Complexities of lack or weak self-correction mechanisms are very dominant in communities where transparency, equity and security are absent or weak. This is articulated by the lack of the mechanisms of self-correction: monitoring and evaluation which results in the complication of problems instead of identifying and solving them.

3.2 CONFRONTING COMPLEXITY OF PPP THROUGH MODELING

Modeling has been an effective tool used to better understand, simplify, predict, explain and control complex phenomena in various fields of science and knowledge.

A simple early definition states that a model is a representation of reality (Ackoff and Sasieni, 1968), of which there are several types.

There are several classifications of model types under several terms, the researcher would state the classifications that would help further in identifying the most helpful model in fulfilling the research task.

According to Christian J. E. Castle, 2006, the space of possible models could be divided and typified into;

- Physical or digital (computer models);
- Static, or dynamic,
- Individual or aggregate,
- Explanatory or predictive.

Each of these types is explained according to PPP model requirements. To multidisciplinary PPP complexity, the desired PPP model needs to have the following characteristics;

From the planning aspect, PPP complexity needs

- An effective multi-entities, aspects and settings based modeling to face multiplicity.
- A model with advanced communication system to assure high Interactivity
- a dynamic model type of model that takes time as a main factor affecting model's constituents and outcomes.
- An adaptive model to deal with PPP Non-linearity

From the informational aspect, PPP complexity needs

- A model that takes local knowledge as the basic reference to confront Over-information.
- Multi data formats each with different Meta data levels to confront implication and fragmentation
- A digital model that faces volatility through archiving
- A digital model that face inconsistency of information through standardization

From the social aspect, PPP complexity needs

- An individual modeling type that faces complex accumulated problems through decomposition of all entities into basic constituents.
- A physical model that faces embedment through awareness campaigns.
- A model that faces internal limitations and external restrictions through self-organization of its basic constituents.
- A model that enables the community to perform an easy and effective self-correction mechanism, through monitoring and evaluation

3.2.1 NATURE OF THE REQUIRED MODEL

To further elaborate on the nature of the required model according to Castle's classification of model types, and the requirements stated to face each complexity, PPP needs the following:

a- Physical model facing social complexity and digital model facing informational complexity

Physical models are those models that exist and perform in real world. An example of this type of model is the conventional participatory planning, where representatives of the community altogether with facilitators and NGOs are gathered physically in a real-time meeting to perform the planning process.

Digital models are those models performed using computers to represent different elements of the problem at hand and their interrelations through the interaction that the system predicts.

The desired model needs to be a blend of the physical and digital type. Taking the advantages of the two types would help the model to compress time and effort required for PPP by the help of computers, and at the same time physical, in a sense of being applicable in real life and has a presence and effect on all various societies even those who are unwired and at the last mile of connectivity.

b- Dynamic model for PPP sustainability

There are static and dynamic models. Models can be static if the input and output both correspond to the same point in time, or dynamic if the output represents a later point in time than the input. Static models provide indexes or indicators that can provide some predictors of impacts or sensitivities. Dynamic models go further by attempting to project quantifiable impacts into the future and are used in developing some (what if) scenarios.

The required PPP model is of the dynamic type, where time and place play a great role in the change of outputs. This type would improve community's

PPP learning and the process adaptability and accordingly guaranty its sustainability.

c- Explanatory model to face implication

Explanatory modeling explores theory and generates hypotheses. The primary purpose is not to predict the future behavior of a system, but rather to provide a framework in which past observations can be understood as part of an overall process.

One of the main requirements of PPP model is to clarify and simplify the process to its performers through abstraction as well as improve the efficiency of its performance. Though dynamic (time plays a big role in PPP and its adaptability), the model doesn't need at this level of interpretation to predict any future results. Therefore, the explanatory type of modeling is more suitable for the required PPP model.

d- Individual model to face social complexity of accumulation

Models could also be typified into individual models or aggregate ones. This classification determines the design type. While the individual model deals with the basic constituent element of its architecture, aggregate model studies the behavior of group of elements and the common characteristics and rules that govern this aggregate. However, progress has been made in the individual modeling due to the increased speed and storage capacity of computers.

PPP is by nature a bottom-up process hence it is more practical to use the individual type of design which starts from the basic constituent element to the whole.

Individual modeling assumes that individual elements act freely without a central control or a pacemaker. However, they act upon rational bounded regularity i.e. working within rules.

This individual modeling type could help understand the role of each performer, the relations between them, and help untangle accumulated problems each as a separate unit.

3.3 COMPLEXITY; A SOLUTION TO PPP PROBLEMS

Complexity has always been a general problem common in almost every field of knowledge. One of the known scientists' key to solving complexity was biology. Biology was the basis or origin of both Complexity Science and Cybernetics.

Complexity science and cybernetics went through two parallel lines of development. The former was an interpretation of complexity or complex systems from biologic approach, and trying to reach to governing rules of biologic phenomena to understand how complex systems worked, while the latter was a translation of the biologic interpretation into computer models that help solve certain problems, or give a way to new wider capabilities.

The relation between biology, complexity and cybernetics used what's known as the General System Theory¹ to translate the main biologic phenomena into other scientific fields. —Self-organization”, —Regeneration”, —Adaptation”, —Survival for the fittest”, —Genetic coding” are all familiar terms in the biology field. Each of these terms was the key to understanding complex systems and was, in a way, the key to solving certain problems in sociology, computer science and physics.

3.3.1 COMPLEXITY SCIENCE SOLUTIONS FOR PPP

—Complexity science” is a new approach to science that is studying the behavior of systems performing or producing complicated tasks or phenomena, by studying their basic constituents and their interrelations with each other and with the surrounding environment.

¹ GST is a theory that supports the notion that multidisciplinary fields could be brought together to build a more comprehensive sort of knowledge, or to face complexity of real life. It was defined by Von Bertalanffy as the theory that faces similar problems and concepts which had evolved in different fields and needs derivation of multidisciplinary rules to govern them in general, regardless of the nature of their components. (Bertalanffy, 1975)

Complexity science comes under many titles, and serves many fields;

"Complex systems" is a scientific field which studies the common properties of systems that are considered fundamentally complex. Such systems are used to model processes in biology, economics, physics and many other fields. It is also called complex systems theory, complexity science, study of complex systems, sciences of complexity, non-equilibrium physics, and historical physics."

(Wikipedia Encyclopedia, 2009)

It is the purpose of this kind of science to model complex systems to understand how their constituents work to give rise to higher collective behavior.

A pioneer in the field, the Nobel prize economist and philosopher Friedrich Hayek dedicated much of his work, from early to the late 20th century, to the study of complex phenomena, not restricted with one field, where his work reached human economies, psychology, biology and cybernetics.

Ever since Hayek's work of complex systems, Complexity science developed through many other scientists in continuous trials to model complexity and explain system's complex behavior. "Self-Organization, Autopoiesis and Adaptation, Emergence, Dynamics in Systems, New Science of Networks and Global Network Society" are all milestones in Complexity Science Development.

This part is dedicated to explaining generally what each of these developments means, and their possible reflections on PPP problem space.

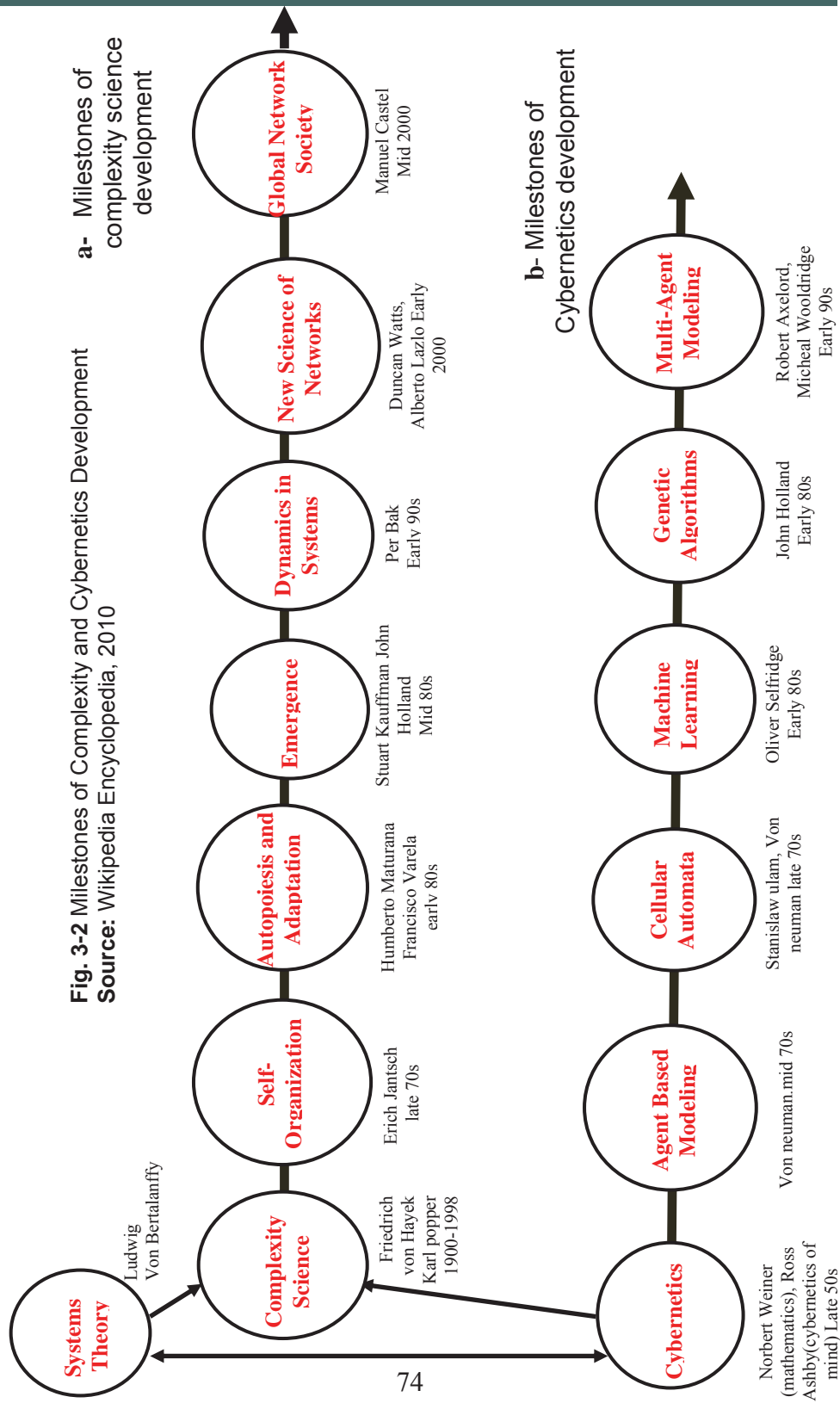


Fig. 3-2 Milestones of Complexity and Cybernetics Development
Source: Wikipedia Encyclopedia, 2010

3.3.1.1 Self-Organization

Self-Organization is a process of attraction and repulsion where the internal referentiality (without being guided or managed by outside source) is the guiding internal relations of a system which gives rise to complicated structures. (Wikipedia Encyclopedia, 2010)

a- General perspective:

A commonly seen example of "Self-Organization" in the biological systems is birds flocking

"In biological systems self-organization is a process in which pattern at the global level of a system emerges solely from numerous interactions among the lower-level components of the system. Moreover, the rules specifying interactions among the system's components are executed using only local information, without reference to the global pattern."

(Camazine et al, 2003)

Another example of "Self-Organization" in Physics is the crystal lattice shape of molecules found in diamonds and precious stones, and many physical composites.



Fig.3-3: Birds flocking, an example of self-organization in biology

Source: Christoffer A Rasmussen, 2010

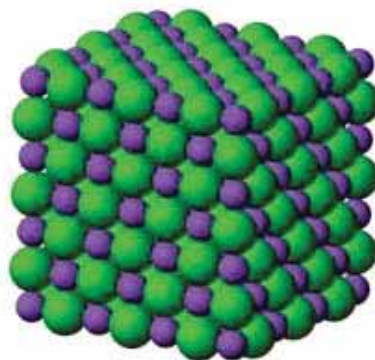


Fig.3-4: Crystal structure of sodium, chloride

Source: Mills, 2010

A contemporary example of the self-organization is the Egyptian youth revolution of the 25th January 2011, where millions of protestors burst to demand freedom, dignity and social justice. There was no leader for this revolution, even the organizers didn't expect the numbers of protestors to reach millions and to spread all over the country in almost all of its governorates.

a- PPP Perspective:

If "self-Organization" is to be reflected on PPP it might help in understanding how large number of community members could organize to participate in PPP.

Self-referentiality is the social application of Self Organization. This is actually the basis of a social theory introduced by Niklas Luhmann in 1984. He stated that elements of a social system are self-producing communication. Through continuous reproduction of communication chains, a social system can reproduce itself as long as there is dynamic communication. Facebook and twitter are good examples of such intensive kind of communication.

Self-organization is dependent on an internal rule that governs the interrelation of the system, or organization components. This is why it is called self-referentiality. Also the growth of such systems is usually fuelled by an ideology or social force that is adhered to or shared by all participants in the network.

Luhmann describes modern society as a complex system of communication which is distinguished from other societies though its interconnected social subsystems.

"Each of these systems reproduces itself recursively on the bases of its own, system-specific operations. Each of them observes itself and its environment, but whatever they observe is marked by their unique perspective, by the selectivity of the particular distinctions they use for their observations."

Luhmann, 1995

This self-referentiality forms the social identity of any social association, be it a group, organization or a network. This social identity identifies what is meaningful and what is not. If this association fails to maintain that identity, it ceases to exist as a system and dissolves back to the environment it emerged from. (Fuchs, 2001)

To understand how self-organization could occur in communities performing PPP, rules governing self-organization should be very clear.

Community's self-organization is dependent on two basic rules. Producing communication chains among participants, and self-referentiality of each social group.

First rule: Intensive communication chains;

Conventional PP that mainly depends on face to face deliberation can hardly meet the needs of self-Organization of excessive communication. This face to face deliberation, though has its own convenience and appeal in some communities especially where illiteracy and low income prevails, yet it demands high commitment, time consumption, travel costs, and many other obstacles. Multiple asynchronous communication means could help solve this problem and at the same time increase interaction between participants with low cost, little commitment, and convenience privileges.

Furthermore, Communication means used in performing PPP by a community should be equivalent to their culture and average income.

Second rule: Self-Referentiality;

It is the secret ingredient of grouping people. Normally People gather around common problems and hopes. If there is a technique, rule or framework that they all settle on, to tackle their problems and reach their goals, then social groups would be organized without any external intrusion neither from governments nor from donor organizations.

3.3.1.2 Autopoeisis and Adaptation

Autopoeisis is the process of transformation and destruction of a group of entities bound together by self-referentiality and their own cognition as a response to dynamically changing surroundings to perform a certain task.

a- General Perspective:

The term was originally introduced by Chilean biologists Humberto Maturana and Francisco Varela in 1972.

An autopoeisis is a cell organized (defined as a unity) as a network of processes of production (transformation and destruction) of components which:

- (i) *through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and*
- (ii) *constitute it as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network.*

(Maturana and Varela, 1980)

They define living systems not as objects of observation and description, nor even as interacting systems, but as self-contained unities whose only reference is to them. The consequence of their investigations and of their living systems as self-making, self-referring autonomous unities is that they discovered that: living systems are cognitive systems, and living as a process is a process of cognition.

Cognition is considered as the ability of adaptation in a certain environment when experiencing external factor that threatens its existence or the purpose of its being.

"Any cohesive social institution is an autopoietic system- because it survives, because its method of survival answers the autopoietic criteria, and because it may well change its entire appearance and its apparent purpose in the process."

(Humbert R.1980²)

² This quotation said by Sir Stafford Beer, who wrote the preface -on Autopoeisis- for Humbert R. book. See Bibliography for information on the book.

b- PPP perspective:

This Biologic concept of Autopoeisis and adaptation pragmatically has no direct application in the planning or urban fields, yet as a concept it implies the key to the third paradigmatic shift. Adaptation serves the purpose of survival and sustainability. If the Participatory Planning could survive and sustain its being, then it would turn form product, time limited project to a sustainable process.

Sustainability is the reflection of Autopoeisis and adaptation on PPP. If PPP is to be sustainable, then basically it needs a permanent institution.

For this institution to survive it needs to dynamically adapt to all changes around it, weather internally or externally, social, political, economic or environmental.

Sustainability of PPP institution demands a self-corrective mechanism, where it follows flexible internal monitoring and evaluation specifications to correct plans, actions and projects. Therefore, monitoring and evaluation measures should differ from one place to another, according to internal and external environment of any community.

3.3.1.3 Emergence

Emergence is the way complex systems and patterns arise out of a multiplicity of relatively simple interactions. Emergence is central to the theories of integrative levels and of complex systems. Professor Jeffrey Goldstein in the School of Business at Adelphi University provides a current definition of emergence in the journal, *Emergence* For Goldstein;

"the arising of novel and coherent structures, patterns and properties during the process of self-organization in complex systems".

(Goldstein 1999)

a- General Perspective:

A relative example to the production of higher complex functions from simple blocks is the human brain. As Marvin Minsky³, 1986, constructs in his famous book of "The Society of Mind" a model of human intelligence, which is built layer by layer from interactions of simple parts called agents. These agents as he describes them are mindless. Higher abilities of mind and intelligence are the product of this interaction between those mindless agents. This reinforces the idea of emergence which states that the whole is more than the sum of the parts.

The great power in viewing a mind as a society of agents, is that different agents can be based on different types of processes with different purposes, ways of representing knowledge, and methods for producing results. This idea is perhaps best summarized by the following quote:

"What magical trick makes us intelligent? The trick is that there is no trick. The power of intelligence stems from our vast diversity, not from any single, perfect principle".

(Marvin Minsky, 1986 , p. 308)

b-PPP perspective:

In order for higher patterns and properties of PPP to emerge, diversity and large numbers of participants is basic requirement for the satisfaction of emergency rules.

Emergence in PPP could appear in different forms, patterns and properties, for example;

-Emergent Social Patterns: may be children working groups, grandparents working groups, local bands for concert shows dedicated to raising awareness,

-Emergent communication patterns (like ~~Mansheia~~ local channel"⁴)

³ Marvin Minsky Cofounder of the Artificial Intelligence Laboratory, MIT

⁴ Local channel in Mansheit Nasser locally transmitted and dedicated to weddings parties in the local area

-Emergent community properties like collective intelligence, which would yield in uncommon local solutions for problems.

Collective intelligence is one of the very useful emergent properties and could help enhance the success of PPP. Grasping diversity and maximizing participation could be the starting point for evolution and development, which would yield in the natural emergence of higher levels of intelligence of the community.

Collective intelligence (CI) is defined by the Wikipedia encyclopedia, 2005, as:

-A working form of intelligence which overcomes "groupthink" and individual cognitive bias in order to allow a collective to cooperate on one process—while maintaining reliable intellectual performance. In this context, it refers to robust consensus decision making —

Another CI pioneer, George Pór, (1995), defined this phenomenon as:

"The capacity of a human community to evolve toward higher order complexity thought, problem-solving and integration through collaboration and innovation."

The main function of a community's collective intelligence, from his point of view, is to provide it with the ability to respond to changes and challenges that are emerging in the conditions of complexity and chaos in a dynamically adaptive behavior.

Indeed George Por, 1995, went further to metaphor the community as a living organism and the CI as the nervous system of this organism.

This biologic perspective of the urban entities was earlier adopted by Jane Jacob, who conveyed a vision of the city as far more than the sum of its residents – closer to a living organism, capable of adaptive change.

-Vital cities have marvelous abilities for understanding, communicating, contriving, and inventing what is required to combat difficulties".

(Jacobs, 1961)

Indeed the brilliance of Jacobs lies in her early belief that “interaction” enabled cities to create emergent systems. That belief was the cause of her fighting against any urban planning that “got people off the street”.

Consequently, the number of participants in PPP is one of the great factors affecting this interaction that emerges the CI of the community.

Maximizing the number of participants along with the information and integration is a key factor affecting the emergence of CI and thus the success of the whole PPP as well as the key to the rootedness of democracy and enhancing development of the community.

This belief was also adopted by Fuchs who said;

“If knowledge implies creativity and social relationships this means that full creativity of a system can only be realized if active participation of all members of a social system is encouraged.”

(Fuchs, 2004)

Contrasting with Nabeel Hamdi (in his attempt to avoid complexity of the PPP rather than face it) who characterized participatory action planning as one which *avoids maximizing information, co-ordination, integration and participation*, Steven Johnson argued that “collective intelligence” emerges only when large numbers of individual elements interact and organize themselves. (Hamdi, 1997, Johnson, 2002)

The magnificence of the emerging CI of the community as Johnson argues, being a complex system, is that over time the whole community persists over its constituents, generating coordinated global behavior out of local interactions

“the persistence of the whole over time – the global behavior that outlasts any of its component parts – is one of the defining characteristics of complex systems.”

(Johnson, 2002)

Furthermore, George Por, 1995, argued that the emergence and evolution of the communities' CI depends on how effectively it can perform the following four functions:

- *To facilitate the exchange and flow of information among the subsystems of the organism and with its environment.*
- *To effectively coordinate the harmonious action of the subsystems and the whole*
- *To store, organize, and recall information as needed by the organism*
- *To guide and support the development of new competences and effective behaviors.*

(George Por, 1995.)

If Por's functions could be translated into an information system, he could be very well talking about a special one, a one that is now known as collaborative information system"

Hence knowledge also has ethical implications; a fully knowledge-based society is a participatory society. Participation allows an effective usage of the knowledge of human beings in such a way that they can share and jointly co-ordinate their knowledge in order to produce new knowledge. Sharing and communicating knowledge in order to co-operate allows creative synergies between human beings that result in the emergence of new knowledge in a system. Sharing, partnership, and co-operation also seem to be ethical imperatives for a sustainable and participatory management of knowledge that allows benefits for all members of an organization. (Fuchs, 2004)

3.3.1.4 Systems Dynamics

System dynamics is the field of studying complex system behavior over a period of time. What distinguished system dynamics is its study of the internal feedback loops and stocks and flows⁵. These elements show how non-linearity of a system could affect its behavior causing its complexity. (Wikipedia Encyclopedia, 2010).

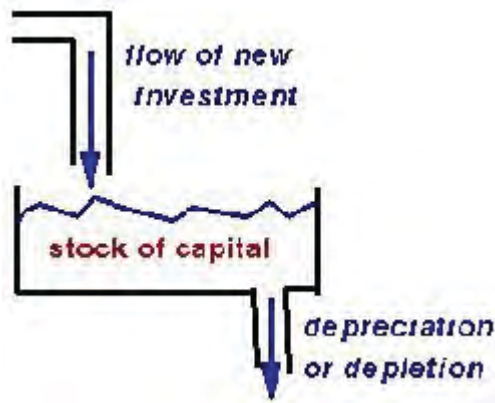


Fig.3-5 : Stock versus flow
Source: Devine J., 2004

–System dynamics is a methodology and computer simulation modeling technique for framing, understanding, and discussing complex issues and problems. Originally developed in the 1950s to help corporate managers improve their understanding of industrial processes, system dynamics is currently being used throughout the public and private sector for policy analysis and design.”

(Robert, 2010).

System dynamics was created during the mid-1950s by Professor Jay W. Forrester of the Massachusetts Institute of Technology (MIT). (Robert, 2010). System dynamics is an aspect of systems theory as a method for understanding the dynamic behavior of complex systems. The basis of the method is the recognition that the structure of any system — the many circular, interlocking, sometimes time-delayed relationships among its components — is often just as important in determining its behavior as the individual components themselves. (Wikipedia Encyclopedia, 2010).

⁵ A stock variable is measured at one specific time, and represents a quantity existing at that point in time, which may have been accumulated in the past. A flow variable is measured over an interval of time. Therefore a flow would be measured per unit of time.

a-General Perspective:

System dynamics has many application, a relevant one is in the social dynamics.

–Sociodynamics is a general modeling strategy for the quantitative description of dynamic processes in the human society. The central concepts of sociodynamics include transition rates depending on dynamic utilities and the master equation for the probability distribution over macro variables.”

(Wolfgang Weidlich, 1997)

Some social variables are easily measured, while others need additional research and even the development of auxiliary models. A constructive synthesis of the social sciences with mathematics calls for the introduction of adequate methods for the measurement of those variables. One social variable that is relatively well accessible to direct measurement is population size. (Korotayev A. et al. 2006)

Population size is affected by birth-death rates and by migration. Each has so many variables affecting it. For example migration is affected by income, production, densities, consumption, cost, etc. The driving force of density changes is the spatial difference of incomes motivating the individuals to migrate to locations of optimal income. This nonlinear process leads to the self-organization of spatially heterogeneous population distributions forming the settlements. (Wolfgang Weidlich, 1997)

b- PPP Perspective:

From the late 1950s to the late 1960s, system dynamics was applied almost exclusively to corporate/managerial problems. In 1968, John Collins, a former mayor of Boston, together with Forreter, produced their book *–Urban Dynamics”*. The Urban Dynamics model presented in the book was the first major non-corporate application of system dynamics.

They argue that in the complex dynamic behavior of cities, it is hard to distinguish between the cause and effect of a certain problem. This would lead –in their opinion- to treating symptoms of the problem instead of

treating the cause. Their model illustrates why many well-known urban policies are either ineffective or make urban problems worse. Further, their model shows that counter-intuitive policies -- i.e., policies that appear at first glance to be incorrect, often yield startlingly effective results. For example, Forrester argues that in their Urban Dynamics model, a policy of building low income housing creates a poverty trap that helps to stagnate a city, while a policy of tearing down low income housing creates jobs and a rising standard of living for all of the city's inhabitants. (Robert, 2010, Forrester, 1969)

They even described complex systems of being deceiving and misleading when searching for solutions for them as they say;

–To make matters still worse, the complex system is even more deceptive than merely hiding causes. In the complex system, when we look for a cause near in time and space to a symptom, we usually find what appears to be a plausible cause. But it is usually not the cause. The complex system presents apparent causes that are in fact coincident symptoms. The high degree of time correlation between variables in complex systems can lead us to make cause-and-effect associations between variables that are simply moving together as part of the total dynamic behavior of the system. Conditioned by our training in simple systems, we apply the same intuition to complex systems and are led into error. As a result we treat symptoms, not causes. The outcome lies between ineffective and detrimental.”

(Forrester, 1969 P: 8,9)

As could be deducted, space and time are crucial issues when it comes to studying urban planning and social structures. Either obviously or determining excluding them from the analyses of social content renders PPP static, out of place. As Brunto Latour said:

"Most of the difficulties we have in understanding science and technology proceeds from our belief that space and time exist independently as an unshakable frame of reference inside which events and place would occur. This belief makes it impossible to understand how different spaces and different times may be produced inside the network built to mobilize, cumulate and recombine the world"

(Latour, 1987. P: 228)

Time is a challenging factor affecting the success of PPP. Long participatory planning has a lot of undesirable effects on the process, socially and environmentally. For example; Commitment is harder over long time, changes are more probable over long time, faith and trust decreases over long time.

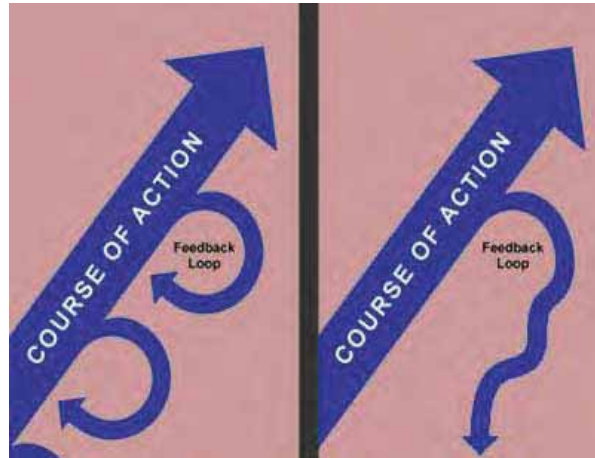


Fig.3-6: The difficulty of planning the physical environment is that the feedback loops are too long.

Source: Stewart Brand, 2005

PPP needs considerable

learning on the part of both professionals and Participants. Since much of the individual learning comes from direct personal experience—in other words, feedback from a range of situations and actions—it's often difficult to understand the slowly evolving consequences of planning in everyday terms.

Shortening time of participation could help shorten feedback loops and improve course of action.

3.3.1.5 New Science of Networks

Network science is a new and emerging scientific discipline that examines the interconnections among diverse physical or engineered networks, information networks, biological networks, cognitive and semantic networks, and social networks. This field of science seeks to discover common principles, algorithms and tools that govern network behavior. Network science holds the promise of increasing collaboration across disciplines, by

sharing data, algorithms, and software tools. (Wikipedia Encyclopedia, 2010)

a- General Perspective:

Using network science in the social field has produced the “Social Network Science”. This field helps in examining how organizations and individuals (including organizations, nation states, or web sites) interact with each other, characterizing the many informal connections that link executives together, as well as associations and connections between individual employees at different organizations.

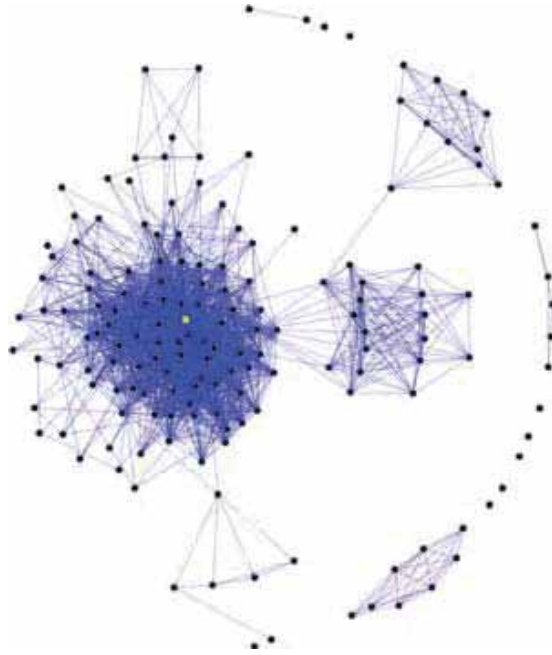


Fig.3-7 : Example of a Social Network diagram

Source: Wikipedia Encyclopedia, 2010

Social network analysis maps relationships between individuals in social networks. Social network analysis views social relationships in terms of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. The resulting graph-based structures are often very complex. There can be many kinds of ties between the nodes. Research in a number of academic fields has shown that social networks play a critical role in determining the way problems are solved, organizations are run, and the degree to which individuals succeed in achieving their goals. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines as shown in fig. 3-7.

Several analytic tendencies distinguish social network analysis: For example, the shape of a social network helps determine a network's usefulness to its individuals. In other words, It is better for individual success to have connections to a variety of networks rather than many connections within a single network. Similarly, individuals can exercise influence or act as brokers within their social networks by bridging two networks that are not directly linked (called filling structural holes).

Network analytic tools are used to represent the nodes (agents) and edges (relationships) in a network, and to analyze the network data.

a- PPP perspective:

One of PPP challenges of applicability is the difficulty to recognize “who needs to learn what” as previously stated by the World Bank. Knowledge distribution among participants and Resources locations needed for the performance of the strategic plans are also two factors affecting the success of PPP. Dynamic changes of knowledge, resources and individuals over time make PPP problem even more complicated. This complicated, social network could make the use of what is called “dynamic Social Networks”.

Such a field is an expansion of the “Social Network Analysis” or (SNA). With the emergence of the Dynamic Network , scholars such as Kathleen Carley was able to study relational data of complex socio-technical dynamic systems with networks that have plurality of node types such as people, organizations, resources and tasks (multi-plex), attributes of both nodes and edges (rich data) and data over time (dynamic). The dynamics result from multiple change processes such as natural evolutionary processes including learning, birth and aging as well as intervention processes such as altering the set of individuals who lead a system. These changes have moved the field from trying to assess networks of less than a

thousand nodes to assessing networks as large as million nodes, and from networks associated with one point in time to networks transcending multiple points in time. By taking into account not just the web of relations among people and organizations, but also their relations with resources, knowledge, events, etc., key insights into diverse behaviors can be gained (kathleen M. Carley et al, 2006)

3.3.2 CYBERNETICS SOLUTIONS FOR PPP MODEL

Cybernetics is a field that aims to understand and define the functions and processes of systems that have goals. Studies in cybernetics provide a means for examining the design and function of any system, including social systems such as business management and organizational learning, for the purpose of making them more efficient and effective. (Wikipedia encyclopedia, 2010)

It was conceived by Norbert Wiener, who coined the term in 1948. Cybernetics was defined by Wiener, in his book of that title, as the study of control and communication in the animal and the machine.

Generally it is the science of regulation and control in animals (including humans), organizations, and machines when they are viewed as self-governing whole entities consisting of parts and their organization. Cybernetics views communication and control in all self-contained complex systems as analogous. It differs from the empirical sciences (physics, biology, etc.) in not being interested in material form but in organization, pattern, and communication in entities. Because of the increasing sophistication of computers and the efforts to make them behave in humanlike ways, cybernetics today is closely allied with artificial intelligence and robotics, and it draws heavily on ideas developed in information theory. (Britannica concise encyclopedia, 2010)

Its focus is how anything (digital, mechanical or biological) processes information, reacts to information and changes or can be changed to better accomplish the first two tasks. (Kevin Kelly, 1994)

In the early 1940s John von Neumann, although better known for his work in mathematics and computer science, did contribute a unique and unusual addition to the world of cybernetics. His work was the cause of founding the concept of self-replication which cybernetics adopted as a core concept. The concept that the same properties of genetic reproduction applied to social memes, living cells, and even computer viruses is further proof of the somewhat surprising universality of cybernetic study.

The gradual advances of this field helped in shaping the development of cybernetics until it reached to its current studies in Multi agent modeling. -Cellular automata”, -agent based modeling”, -machine learning”, -Genetic algorithms” and -Multi Agent Modeling” are all milestones in the development of cybernetics. The following section is devoted to exploring the general perspective of each of them and their reflections on PPP.

3.3.2.1 Agent Based Modeling

An agent-based model (ABM) is a class of computational models for simulating the actions and interactions of autonomous agents (both individual or collective entities such as organizations or groups) with a view to assessing their effects on the system as a whole.

ABM can be typified as the study of artificial societies of autonomous agents. The models simulate the simultaneous operations and interactions of multiple agents, in an attempt to re-create and predict the appearance of complex phenomena.

Agent Based Modeling could be very useful in understanding the main agents involved in the Participatory Planning, their functions, activities and inter-relations.

The process is one of emergence from the lower (micro) level of systems to a higher (macro) level. **As such, a key notion is that simple behavioral**

rules generate complex behavior. This principle, known as K.I.S.S. "Keep it simple and stupid", an acronym, first introduced by Robert Axelrod. (Axelrod 1997, Christian J. E. Castle 2006, Wikipedia encyclopedia, 2010).

The definition of the term agent hasn't been the same for modelers, where some considered the agent as any type of independent component, be it a software, a model or an individual, while others insisted on the component to have certain characteristics in order to be an agent, like being adaptive, and able to learn from their environments and change their behavior accordingly. (Christian J. E. Castle 2006)

Agent based modeling (ABM) is particularly useful in the simulation of human social behavior and individual decision making. (Bonabeau, 2002). Agent based concept is a mindset more than a technology, "*where a system is described form its constituent parts*". (Christian J. E. Castle 2006).

a- General Perspective:

Agent-based models have been used since the mid-1990s to solve a variety of business and technology problems. Examples of applications include supply chain optimization and logistics, modeling of consumer behavior, including social network effects, distributed computing, workforce management, and portfolio management. They have also been used to analyze traffic congestion. (Kutluhan, 2007).

In these and other applications, the system of interest is simulated by capturing the behavior of individual agents and their interconnections. Agent-based modeling tools can be used to test how changes in individual behaviors will affect the system's emerging overall behavior.

Agent based evolutionary search or algorithm is a new research topic for solving complex optimization problems. (Ruhul A Sarker and Tapabrata Ray, 2010).

b- PPP perspective:

ABM has been successfully used in social sciences, due to its ability to deal with heterogeneous societies, autonomous individuals, and the interrelations between them. In fact, the ABM matches to a great extent when thinking of a social model for PPP.

In social simulation, ABM is used to model behavior of agents and the communication between them in order to better understand how these individual interactions impact an entire population.

According to Macy and Willer (2002) the development of ABM reflects the

growing interest in the possibility that human groups, like flocks of birds, may be highly complex, nonlinear, path-dependent, and self-organizing”,

In contrast to the traditional understanding of social life *as a hierarchical system of institutions and norms that shape individual behavior from the top down”.*

They conclude, that:

“we may be able to understand these dynamics much better by trying to model them, not at the global level but instead as emergent properties of local interaction among adaptive agents who influence one another in response to the influence they receive.”

Adoption of the “K.I.S.S.” acronym of Axelord in PPP would help increase commitment of participants (participants don’t have to attend lengthy workshops, commit to a fixed schedule, and execute many tasks). Instead of giving PPP tasks to small highly trained group of participants, divide PPP tasks to small and easy ones, and distributing them over large groups of participants.

Planning functions, if distributed among participants, would yield in a distributed, easy, quick participation. The voting function is the most important of them all i.e. those who didn't participate (whether passive or busy) could still have the chance to vote on the final results. This way

nobody would be left out completely. Each would contribute with less time and effort, while the community would gain much more from their collected work, than it does from the highly trained small group.

3.3.2.2 Cellular Automaton (CA)

An automaton is a self-operating machine. It is a processing mechanism with its own characteristics that change over time according to internal rules and characteristics and external input.

Using the Automaton has helped individual model develop progressively. Applied to wide scope of problems, the "Automaton approach" has been at the heart of computer modeling research. (Benenson and Torrens, 2004).

CA could model natural complex systems through emergent computation executed at a decentralized information processing. (Wikipedia encyclopedia 2009).

In 1952 John von Neumann created the first cellular automaton (CA) with the goal of creating a self-replicating machine. CA models consist of a regular grid of cells which change their status by a simple set of rules. A

cellular automaton is not an ABM by itself but is used to study clustering within spatial networks.

Langton's loops are a particular "species" of artificial life in CA which usually have a fixed interaction topology (i.e., which neighbors a cell interacts with, is fixed by the cellular geometry).

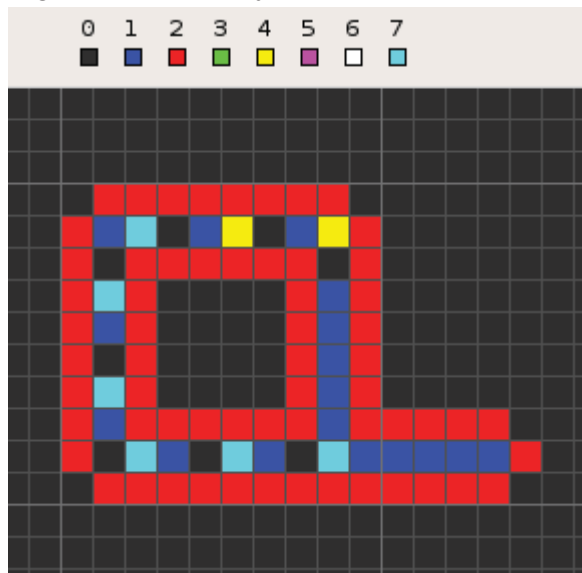


Fig.3-8: Langton,s loop, in starting configuration

Source: Wikipedia Encyclopedia, 2010

It consists of a regular grid of *cells*, each in one of a finite number of *states*, such as "On" and "Off". The grid can be in any finite number of dimensions. For each cell, a set of cells called its *neighborhood* (usually including the cell itself) is defined relative to the specified cell.

a- General Perspective:

Thomas Schelling illustrated, 1978, in one of the earliest ABMs, combined with a CA, a model for neighbourhood segregation. Randomly distributed red and green agents move to empty locations if the number of agents of the same group in the neighbourhood falls below a certain threshold. The model shows that a high degree of residential segregation can emerge from the location choices of relatively tolerant individuals. (Christian Fertner, 2008)

In urban research ABMs dealing with land-use change, often called ABM/LUCC (Agent-based models of land-use and land-cover change), are a widely used form of ABM. These models combine agent-based representations of decision-makers influencing a land-use system with a cellular landscape on GIS-basis. (Christian Fertner, 2008)

b- PPP Perspective:

The idea of self-replicating cells could very well be borrowed in PPP to help maximize number of participants. If a workgroup has the potential of approaching neighboring individuals and forming other workgroup in a self-replicating behavior, this would increase the number of participants in PPP. Like any cellular automaton which follows simple internal binary rule "like ON and OFF", in order to replicate itself (reproduce a cell like its own), individuals, or agents in a work group performing PPP could follow simple rule of communication (input and output), to replicate itself when it reaches a certain number of participants.

Suppose the maximum number of participants working in a workgroup is 50, and the minimum is 25, when a group reaches 50, it starts to target other participants to join in, and when it reaches 75, it divides into a mature group of 50, and an infant group of 25, and the cycle starts all over again.

3.3.2.3 Machine Learning

It is a scientific discipline that is concerned with the design and development of algorithms that allow computers to change behavior based on data (sensor data or databases). A major focus of machine learning research is to automatically learn to recognize complex patterns and make intelligent decisions based on data.

a-General Perspective:

Applications for machine learning include machine perception, computer vision, natural language processing, syntactic pattern recognition, search engines, medical diagnosis, bioinformatics, detecting credit card fraud, stock market analysis, classifying DNA sequences, speech and handwriting recognition, object recognition in computer vision, game playing, software engineering, adaptive websites and robot locomotion.

Some machine learning systems attempt to eliminate the need for human intuition in data analysis, while others adopt a collaborative approach between human and machine. Human intuition cannot, however, be entirely eliminated, since the system's designer must specify how the data is to be represented and what mechanisms will be used to search for a characterization of the data.

b- PPP Perspective

If there is an attempt to decrease dependency of PPP on professionals and donors(as mentioned before in the theoretical objectives of PP in chapter one), the idea of machine learning could be adopted in PPP as a community self-learning approach.

Such an approach could be translated into a mechanism of permanent workshops, websites, monthly published materials, local satellite channels on T.V, or Radio, interactive screens in schools and youth centres, and so many other ways, devoted to providing a guide to community members (with their various cultural and social spectrum) on how to participate in performing the functional steps of PPP.

The self-learning doesn't have to stop at feeding input to the society, in fact it is a learning process of diverging and converging. Diverging input (to society) and converging output (from society), altogether be done while decreasing dependency on professionals and increasing self-sufficiency of community.

Efficient use of the World Wide Web as a means of communication could help this approach. "Web Mining" could help in converging and diverging data among participants. "Web mining" is a technique that aims to discover useful information or knowledge from the Web hyperlink structure, page content and usage log. Web mining tasks are categorized into three main types: *Web structure mining*, *Web content mining* and *Web usage mining*. (Bing Liu, 2006). Web structure and content are both used to search a hyper link, while web usage could have a useful impact on PPP modeling. Web usage mining could be used in workgroups to serve the purpose of circulating information accessed by a user to the others in the workgroup, and to collect community web users of same interests in one workgroup.

3.3.2.4 Genetic Algorithms

In contrast to commonly known programming techniques, where a model is established to solve a problem, by applying pre known solution steps or equations into the system, genetic algorithm is an approach used to solve problems with unknown solutions. It is a method used to search for all possible solutions and choose the best according to the biologic rules; survival for the fittest, cross over, mutation, etc.

–A genetic algorithm (GA) is a search technique used in computing to find exact or approximate solutions to optimization and search problems. Genetic algorithms are categorized as global search heuristics. Genetic algorithms are a particular class of evolutionary algorithms (EA) that use techniques inspired by evolutionary biology such as inheritance, mutation, selection, and crossover.”

(Wikipedia Encyclopedia, 2010)

Evolutionary Algorithms EAs deal with a population of individuals who work cooperatively and collectively to achieve their goals.

Evolutionary algorithms (EAs) are known as stochastic search procedures. EAs have two prominent features which distinguish them from other search algorithms. First, they are all population- based (consider a set of possible solution points in contrast to single solution in conventional optimization). Second, there is communications and information exchange among individuals in a population.

a- General Perspective

EAs are widely used for optimization problem solving. EAs can be regarded as a population-based version of generate-and-test search. They use search operators like crossover and mutation to *generate* new solutions, and use selection to test and identify better solutions. In principle, one may use any search procedure to generate new solutions that will increase the probability of finding a global optimum. (Ruhul and Tapabrata, 2010).

b- PPP Perspective

The idea of forming a “problem-solution” data bank would cut short a lot of time in social understanding, search and prioritization. Prioritization is

based on local criteria. If this local criteria could be defined and set as a base for computer guide to search for all possible solutions and then, arrange them according to local convenience.

This “genetic Prioritization” would help the community when prioritizing alternatives according to optimization criteria embedded in the system in advance and depending on social, environmental and economic factors (for example; Environmental Impact Assessment)

3.3.2.5 Multi Agent Modeling (MAM)

It is a type of modeling composed of multiple interacting intelligent agents. Multi-agent systems can be used to solve problems which are difficult or impossible for an individual agent or monolithic system to solve. The agents in a multi-agent system have several important characteristics:

Autonomy: the agents are at least partially autonomous

Local views: no agent has a full global view of the system, or the system is too complex for an agent to make practical use of such knowledge

Decentralization: there is no designated controlling agent (or the system is effectively reduced to a monolithic system)

a- General Perspective:

As an approach, an agent or multi-agent system is quite different from an evolutionary system or computation. The agents are usually recognized as intelligent agents. A multi-agent system (MAS) is composed of multiple interacting intelligent agents. Typically multi-agent systems refer to software agents. However, the agents in a multi-agent system could equally well be robots, humans, human teams or their combination.

An interesting aspect of the multi agent systems is that the systems can manifest self-organization and complex behaviors even though the

individual strategies of all their agents are simple. This gives the flexibility in designing MAS for a wide range of problems. They are suitable for solving problems where there are different entities, people or organizations with different goals (possibly conflicting) and proprietary information. Examples of problems which are appropriate to multi-agent systems research include online trading, disaster response, and modeling social structures. They can also be used to solve structured problems such as scheduling and transportation. (Ruhul and Tapabrata, 2010).

b- PPP Perspective:

Local viewers, Decentralization and autonomy are key-factors of Multi-agent modeling which when reflected on PPP could have the following interpretations;

Local viewers: participants are local viewers, they describe problems from their own personal experience and they solve them according to personal needs and demands. Keeping this simple notion in mind would simplify the role each participant has to play and the task he/she has to accomplish.

Decentralization: PPP institutions should be local institutions striving for survival by facing changes through flexible local internal regulations. Bound to a national institution for PPP, through intensive communication networks, but still having its own autonomy.

This autonomy could be applied not only on each local area having authority of management , services, training and maintenance over its zone, but also on the working technique of each cell or workgroup which might be solving the same problem, but with different techniques, methodologies, and way of thinking.

The multi-agent urban model, “CityDev” developed by Ferdinando Semboloni, and applied in Florence, Italy, is a good example on how multi-agent models could be helpful in supporting decision making in PPP.

The simulator of the CityDev model runs on a 3D spatial pattern organized in 3D cells (surface: 200 x 200 m), and is based on agents, goods and markets. Each agent (household, industrial firm, commercial firm, service firm, or developer) produces goods (labor, buildings, consumer goods) by using other goods, and then exchanges the goods in the various markets. Because each agent needs a building to live or work in, the urban fabric is produced and transformed. CityDev, also allows human users to participate in the simulation through the Internet. Web users can manage the agents generated by the simulator in addition to any new agents they have established. The participation of human users proposes a new type of support for decision-making in which participatory simulation is embedded in a process of social learning and negotiation and contributes to the establishment of the final decision. (Ferdinando Semboloni, 2007).

This dichotomy of goods and markets is not quiet applicable as it is in PPP, through the relation between agents, goods and markets could be inspiring in understanding the relation between agents performing PPP and the problems and solutions that are present in the process.

3.4 THE BIOLOGIC APPROACH TO PPP

It is so obvious that biology had such a direct and deep influence on the way scientists managed to handle complexity in various fields. For Example, “emergence” as a natural phenomenon influenced so many scientists in answering questions like how does our mind works intelligently. Even adaptation, and Autopoiesis as a biological phenomenon was inspiring to machine learning and cellular automaton.

Specifically, the biologic approach has some traits and characteristics that help serve the Participatory planning process. These are:

- The bottom up approach , which perfectly suits the participatory aspect of the PPP, where the participatory planning comes from the people contrasting to the top-down conventional planning

- Hospitability to the multidisciplinary nature of PPP.

Choosing the biologic approach in dealing with PPP thus has many verifications; one, both are bottom-up approaches, two; the complexity of PPP needs the biologic approach which proved its success in dealing with complicated systems.

Deriving concepts to deal with complexity of PPP could be guide lines to the required model for PPP and several biologic concepts that could enrich PPP and help it abide to success factors.

Fig. 3-9 presents the biologic nature of both complexity science and cybernetics, which in turn is reflected on PPP to provide new and helpful biologic solutions for its problematic. The Biologic solutions follow the same sequence of development of both complexity science and cybernetics and are defined as follows:

1-From biologic bottom-up building to ABM:

A Bottom-Up PPP

A PPP model that is built and operated from the bottom-up. The basic constituent is the building block/unit, from which aggregations occur to form higher levels of social and informational complexities.

2-From Biologic Self-organization:

Community Self-Organization

A PPP that is initiated by an external organizer, but lasts in the local area and runs by local people. Such an organization needs intensive communication and self-referentiality.

3- From regeneration to Cellular Automaton:

A Regenerative PPP

A PPP that could regenerate itself through Self-replication of Working groups

4-From Autopoeisis and Adaptation:

An Adaptive PPP

A *reactive* PPP that could adapt to social, economic and environmental changes through local permanent institution.

5- From biologic Emergence, Machine learning and Genetic Algorithm:

Community self-learning Mechanism

A learning mechanism that provides suitable means for various social spectrum, with little time and effort.

6- From System Dynamics:

A dynamic PPP

A *proactive* PPP that could face threats and disasters before happening.

7-From MAM:

A Collaborative Information system

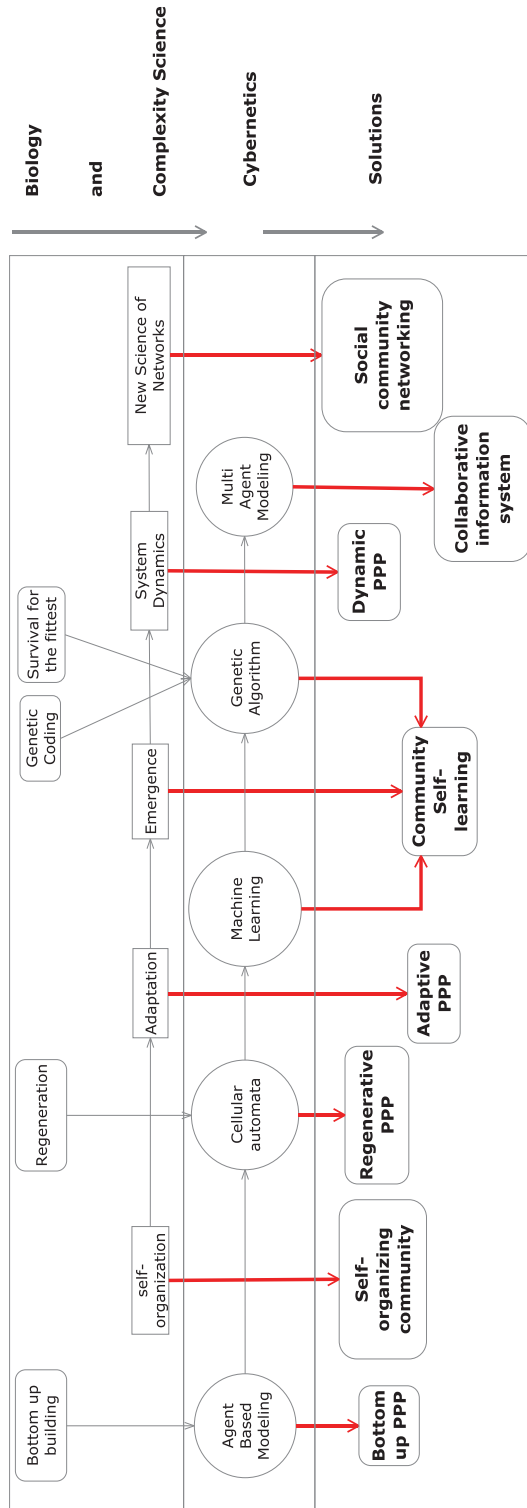
A PPP that provides an information system that take local knowledge as the base, in addition to the professional and governmental knowledge if needed.

8-From Social Community Network:

Social Community Networking

A PPP that provides a communication network for its participants that could be the basis of solid and continuous interaction.

Fig. 3-9 : Deriving solutions From Biology to solve P.P.P. complexity through Complexity Science and Cybernetics.
 Source: researcher



3.5 Brief

The presented biologic solutions each reflects the principles of its origin, either complexity science or cybernetics. Such principles should be the bases of design of PPP model. Table 3-1 briefs biologic solutions and principles corresponding to each of them as follows:

Table 3-1: Solutions and corresponding principles for the PPP model

Source: Researcher

Biologic Solutions	Deducted Principles
1-Bottom Up PPP	<p>-Participant is the basic constituent of the PPP model, where aggregates of participants form workgroups, and aggregates of workgroups forms a Participatory Planning Council. <u>Participants are:</u></p> <ul style="list-style-type: none"> - Simple agents : Follow KISS principle (were tasks are simple and easy). -Local viewers Pose problems and solutions according to personal needs and interests. - Autonomous agents: Have the right to say “No” and “Go” to each decision taken by the workgroup. - Intelligent agents: Capable of learning with different levels and integrate their efforts to accomplish complicated PP steps. - behave according to bounded rationality: Participants follow work flow chart done by the facilitator and approved by them.
2- Community-self organization	<p>-Self-referentiality of workgroup formation where each workgroup refer to one problem and is responsible to solve it according to its needs.</p>
3-Regenerative PPP	<p>-Self-replication of Working groups. Workgroups should have the ability to replicate themselves in other places in the same local area, if commuters are suffering the same problem.</p>
4- Adaptive PPP	<p>-Institutionalization of PPP: form a permanent PP committee (PPC) which comprises all parties (local commuters, LPC, local NGOs). - Decrease dependency on donor and initiator to finance PPP through self-dependent internal financing agencies and funding. - Decrease dependency on donor and initiator to organize PPP through recruiting facilitators who are local commuters.- Decentralize internal PP protocols to suit each local area peculiarity.</p>

Complexity of PPP; Problem and Solution

	<ul style="list-style-type: none"> - Reactive response of PPC to local participants' needs or problems.
5-Community self-learning mechanism	<ul style="list-style-type: none"> -Maximize number of Participants through advertising and awareness campaigns. -Intensify communication between participants - Participants use data bases (collaboratively formed) to learn more about their problem. - use computer decision support systems to analyze data. -participants use problem solution data bank to help them reach to a solution. -participants are provided multiple meta data levels to correspond to different educational levels of participants in order to increase comprehensibility. -learning capabilities increase by experience, so allow error and failure (normal stumble and fall of newly learning participants). -participants are provided distant learning tools (Manuel guide, interactive screens) to increase convenience.
6-Dynamic PPP	<ul style="list-style-type: none"> - Minimize time of participation for each participant. - Update information system corresponding to nature of information and needs of local area and participants. -Proactive response of PPC to face threats and disasters. -PPC monitors and evaluates outcomes of PPP.
7-Collaborative information system	<ul style="list-style-type: none"> -Form Central data bank that has multi sources; Local sources: community and participants Professional sources: consultants Governmental sources: LPC, statistics agencies and ministries. Each of the above parties is responsible for the contribution with its own sources according to a pre-set protocol.
8-Social community network	<ul style="list-style-type: none"> -Form Multi Modal Communication center to offer corresponding communication channels for different nodes (participants) and messages types (audio-video-written, etc.)

Chapter four is a presentation of the most suitable model type and level for the required PPP as well as its aquanting specifications.

Chapter four is an introduction to PPP modeling, where it presents the desired model specification in accordance with the model's nature, previously identified in chapter three. Such specifications are chosen to suit the complex nature of the problematic PPP with its multidisciplinary aspects at the same time.

Multi Agent Modeling- the dynamic, explanatory and individual natured modeling type- is identified as a one that holds within it many solutions to PPP through its biologic origins so it provides a suitable type for the desired PPP model.

Origins of MAM, Conceptual bases of MAM modeling and MAM languages are all discussed in this chapter as an introduction to the analysis and design of PPP model presented in chapters five and six.

Chapter four is divided into four sections;

4.1 discusses PPP model specification concerning the chosen modeling type and levels. Levels are discussed first in general and then PPP specific. According to the purpose of the research, the conceptual level is chosen as the most suitable for the explanatory nature of the desired PPP model.

4.2 provides origins of MAM; starting from Object Oriented Modeling OOM, passing by the Agent Based Modeling before reaching MAM. The development of those three modeling types resulted from accumulative knowledge where each of them built on the one proceeding and added a new dimension and traits to OOM capabilities.

4.3 discusses the conceptual bases of MAM presented in Object Oriented Analysis and Design OOAD. OOA requirements is identified as the analysis of PPP, in chapters one, two and three, in addition to an applied experience still required to complete the OOA phase. It also provides an introduction to OOD highlighting on MAM tools, languages and notations.

4.4 presents common MAM languages and notations that could be used in the OOD. This step is fundamental requirement for building the PPP model in Chapter six.

4.1 PPP MODEL SPECIFICATION

Generally, there are several modeling levels and types. According to the nature PPP model, and the nature of results required from the model, there are certain levels and types that could be suitable for the research to use. This part presents modeling levels and types in general and the suitable ones for the desired PPP model.

4.1.1 TYPE OF PPP MODEL

The nature of the required PPP model was defined earlier in chapter three as a model that is; both Physical (to face social complexity) and Digital (to face informational complexity), dynamic (for sustainability of the process), explanatory (to face implication) and Individual (to face social complexity of accumulation).

Biologic Solutions deduced from both Complexity Science and Cybernetics also needed high level of aggregation, communication and knowledge data base between agents of the model (both human and digital).

Complexity science and cybernetics development followed an accumulative knowledge path that was previously shown in chapter three. Such an accumulative knowledge could be identified looking at “Cellular Automaton” which took “Agent based modeling” and built on, developed later to machine learning and genetic algorithms, until it reached Multi Agent Modeling MAM. It could be understood that MAM includes its own modeling traits, and at the same time enjoys all previous traits in previous modeling types.

Thus MAM offers the collective traits of both complexity science and Cybernetics, which makes it the suitable modeling type for PPP.

MAM also enjoys flexibility and ease of application on both human and soft agents added to its equivalent nature to deal with complexity of PPP.

with great adaptability, autonomy, and at the same time could be set to enhance bottom up PPP approach, self-learning, regeneration, community self-organization and dynamic and adaptive PPP.

4.1.2 LEVEL OF PPP MODEL

There are four modeling levels that are known in modeling the real world. Laurini, 2001, categorized these levels of modeling into: external, conceptual, logical and internal levels. Fig. 4-1 shows the hierarchy of the 4 levels as follows:

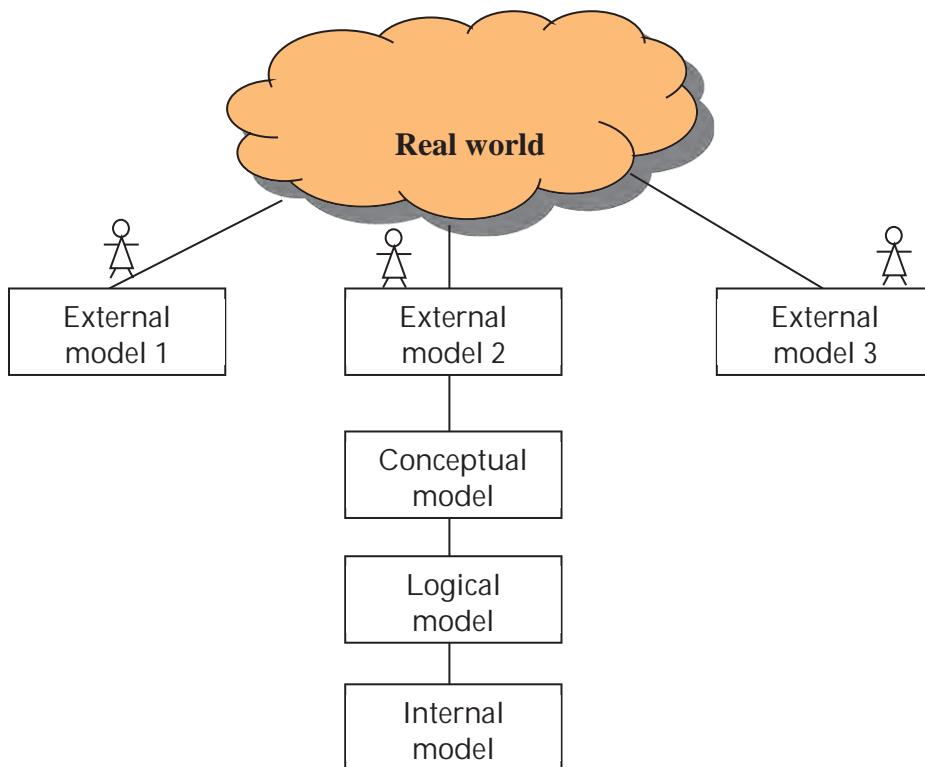


Fig.4-1: Data modeling levels
Source: Laurini, 2001

First level; External level

The very beginning of the model design is the external modeling step in which external users define their own subset of the real world, that is, what is relevant to their needs. For example, a street in real life could have different meaning to different people. For a citizen it serves as a movement channel, for a road engineer it means dimensions and materials, for a traffic administer it means flow percentage, for landscape engineer it means moans and greenery on either sides, and so on. The external level identifies the perspectives and aspects from which the observer views real life.

The proposed PPP model is a one that observes PP from multidisciplinary aspects. It tries to provide three integrated aspects of the PP; the planning aspect, the informational aspect and the social aspect. This level has been previously explained in details in chapters one and two.

Second Level; Conceptual level

This level corresponds to a synthesis of all external models. Although an abstraction of the real world, the result of the conceptual modeling is concrete in nature, consisting of schematic representation of the phenomena and how they are related. The conceptual model not only provides a basis for schematizing, but is also a tool for discussion and must be easily understandable by all potential end users, and by all persons involved in the planning process.

The conceptual modeling level is independent of implementation details. The aim of conceptual model is to express the meaning of terms and concepts used by domain experts (both human and digital) to deal with the problem, and to find the correct relationships between different concepts. Since it deals with meanings, it is also called semantic model. And since it deals with concepts it is knowledge based due to the fact that the concept is the basic unit of knowledge. The conceptual model attempts to clarify the meaning of various usually ambiguous terms, and ensure that problems with different interpretations of the terms and concepts cannot occur.

Two basic approaches are used in conceptual modeling, Entity Relationship Approach and Object-Oriented approach. (Wikipedia, 2009)

Object-oriented approach is an attempt to improve modeling of the real world. Opposing to entity relationship O.O. accepts aggregation which is a basic need when modeling PPP (aggregation of the work of several agents or agencies to solve complex problem). This approach provides a framework for generating models closer to real-world features.

Logical level: formal system specification and defining the basic algorithmic to solving the problem in hand.

Internal level: internal models are at computer level that is to say, they represent the way in which information items are stored at bit/bytes level.

One cannot jump to higher levels of modeling without passing through lower ones. To go to the internal level, one has to pass through the logical level, and to go to the logical level one has to pass by the conceptual one.

The first two levels are obligatory to build the proposed PPP level. While the first identifies the observed aspects of PPP, the second identifies problems and solutions of PPP.

Third and fourth levels are out of the scope of this research because the chosen modeling type is explanatory (as stated before in chapter 3) which requires conceptual modeling level to explain concepts, persons, relationships, problems and solutions of PP and due to the scientific experience of a computer scientist that they require.

4.2 ORIGIN OF MULTI AGENT MODELING (MAM)

MAM is the result of the development of complexity science first from Object oriented modeling, passing by the Agent Based Modeling which was further developed to MAM. Not only is OO modeling the origin of ABM and MAM, but also its language (Unified modeling language-UML) is the origin of AML and other MAM languages (Agent Modeling Language-AML)

4.2.1 OBJECT ORIENTATION MODELING (OOM)

It is a process of planning a model of interacting objects for the purpose of solving a specific problem. It is a common methodology to conceptual modeling.

The Object-Oriented paradigm assists the modular to address the complexity of a problem domain by considering the problem not only as a set of functions that can be performed but primarily as a set of related, interacting Objects. An object combines encapsulated data and procedures required to perform its functions. Object-Oriented model is described by the interaction of these objects through exchange of messages.

The modeling task then is specifying, for a specific context, those Objects (or the Class the Objects belongs to), their respective set of Properties and Methods, shared by all Objects members of the Class.

Properties and Methods are two OO terminologies that are used in OO modeling. There are basic OO terminologies that would be used in the analysis and design procedures. These terminologies are essential to the comprehension of OO modeling.

OO Data Classification

In OO Modeling data is classified into a tree like hierarchy, where the basic constituent is the object, and higher ones are subclasses and then classes. The relation between objects is so much a biologic one, where the baby object inherits the attributes of the mother object or class. The following terminologies and classifications are the bases of not only the OO modeling, but are further used in the MAM modeling. (Wikipedia, 2009, Laurini 2001):

Classification: is a mapping of objects to a common type. Objects can be grouped into classes.

Object: A tight coupling or association of data structures with the methods or functions that act on the data. This is called a class, or object (an object is created based on a class). Each object serves a separate function. It is defined by its properties, what it is and what it can do.

Classes are a collection of objects with the same behavior.

Instances are particular occurrences of objects for a given class.

Subclasses: within classes subclasses classify lower subsets of classes, i.e. the class driving road could be split into two subclasses: street and motorway.

Super class: within classes, super classes classify higher level of a class, i.e. the driving road is a super class of a motor class

Attributes: these are descriptive properties of the real phenomena. Attributes are also known as declarative knowledge, properties, member variables, or member data.

Inheritance: in classification hierarchies, an object in a subclass inherits all attributes of the corresponding higher level class.

Methods: refers to an operation on the data, a procedure which could be applied to a class of objects. Methods are also known as procedural knowledge, operations and messages.

Encapsulation (Information hiding): The ability to protect some components of the object from external entities. This is realized by language keywords to enable a variable to be declared as private or protected to the owning class.

Polymorphism: The ability to replace an object with its sub-objects. The ability of an object-variable to contain, not only that object, but also all of its sub-objects.

As an example, in a model of a Payroll System, a Company is an Object. An Employee is another Object. Employment is a Relationship or Association. An Employee Class has Attributes like Name, Birthdate, etc. The Association itself may be considered as an Object, having Attributes, or Qualifiers like Position, etc. An Employee Method may be Promote, Raise, etc.

4.2.2 AGENT BASED MODELING (ABM)

To leverage the acceptance of existing technology, agents are presented as an extension of active objects, exhibiting both dynamic autonomy (the ability to initiate action without external invocation) and deterministic autonomy (the ability to refuse or modify an external request). Thus, one basic definition of an agent is “an object that can say „go” (dynamic autonomy) and „no” (deterministic autonomy).” (James Odell et al 2001, James Odell, 1999)

Having control over their own behavior is one of the characteristics that distinguish agents from objects. Though objects encapsulate state and behavior (more accurately behavior realization), they fail to encapsulate behavior activation or action choice. Thus, any object can invoke any publicly accessible method on any other object at any time. Once the method is invoked, the corresponding actions are performed. In this sense, objects are totally obedient to one another and do not have autonomy over their choice of action. (Jennings 1999).

As Agent based models are composed of agents interacting in a model, ABM can be typified as the study of artificial societies of autonomous agents (Conte et al, 1998). The relationship between agents could vary from merely being reactive (i.e. agent doesn't act except if triggered to do so by some external influence, which could be the action of another agent), or goal targeted (i.e. it acts according to a preset plan to achieve a certain goal). In addition, agents could behave synchronously (at the same time) or asynchronously (at different times). (Christian J. E. Castle 2006).

The definition of the term agent hasn't been the same for modelers, where some considered the agent as any type of independent component, be it a software, a model or an individual, while others insisted on the component to have certain characteristics in order to be an agent, like being adaptive, and able to learn from their environments and change their behavior accordingly.

However there are some common characteristics for most agents, and below is a list of them: (Brown, D.G. 2006, Christian J. E. Castle 2006).

Autonomy: agents are units capable of taking independent decisions, and exchanging information, without centralized control.

Heterogeneity: agents permit the development of autonomous individuals, though a group of agents can exist, but they are sprawled from the bottom, up.

Active: agents are active as they have their own special influence in a simulation. They are active in the following features;

*pro-active/goal directed: agents are often goal directed i.e. they have a certain task to achieve in a time span. So they are promoting independent actions

*reactive/perceptive: agents are supplied with a mental map of their surrounding environment, so they are aware of the agents around them and their actions. Indeed they react with each other and with the surrounding environment.

*bounded rationality: though having an awareness of the surrounding environment, agents behave according to a set of rules, and not in a haphazard way.

*interactive/ Communicative: agents communicate extensively , asking each other and the neighborhood questions and exchanging information about specific attributes, taking what it needs and disregarding input that doesn't match desirable threshold.

*Mobility: agents enjoy great mobility having the ability to roam the space within a model.

*Adaptation/Learning: agents have memory capacity and the ability to learn which enables them to adapt according to the changing environment.

ABM is specialized in particular in the simulation of human social behavior and individual decision making. (Christian J. E. Castle 2006). ABM could be used in PPP to model individual actions of several actors (agents) and help and organize the task done by agencies (several agents devoted to perform a task) by facilitating interaction and information flow, as well as providing aiding tools for decision making.

Knowing that PPP involves several organizations, and levels of planning, ABM could be a useful tool for studying effects on process that operate at multiple scales and organizational levels.

In 2002, Bonabeau, briefly stated three advantages the ABM has over traditional modeling:

1-Capturing emergent phenomena, which is one of the main targets to the participatory planning process as PPP enhances the emergence of the collective intelligence of the society and promoting creativity and brainstorming in solving community problems.

2- Provides natural environment for the study of certain systems: in particular ABM could be used when activities rather than processes could better describe a system (PPP is a set of activities done by the participants),

and when the individual constituent of the system:

a-Has an unexpected behavior sometimes (see non-linearity of PPP chapter 3),

b-Has a complex behavior (typically applicable to a heterogeneous society within a community)

c-Has a stochastic behavior (random behavior of diversified societies)

3- Flexibility. This is one of the most important advantages of ABM, where it could be built upon, modified, to suit the change in societies needs over time. ABM could provide a flexible framework for tuning the complexity of agent (their behavior, degree of rationality, ability to learn and evolve, and rules of interaction) (Christian J. E. Castle 2006). Another way of this flexibility is the ability of the ABM to adjust levels of description and aggregations. It is easy to classify the model into aggregate agents, sub-group of agents and single agents.

4.2.3 MULTI AGENT MODELING (MAM)

The difference between the ABM and MAM is that the latter has the ability of collaboration between its agents and agencies to perform tasks and solve problems of higher levels of complexity that are impossible for individual agents or monolithic system to perform. Fig. 4-2 present an elaboration of a hierarchy of agents collaborating to form an agency performing a complex task.

Multi Agent System MAS is a system composed of multiple interacting intelligent agents. Problems which are appropriated to multi-agent systems research include modeling social structures. Typically multi-agent systems research refers to software agents. However, the agents in a multi-agent system could equally well be robots, humans or human teams.

A multi-agent system may contain combined human-agent teams. This makes it suitable to model the PPP, where human participants are key actors in the model, while digital agents are virtual supportive ones.

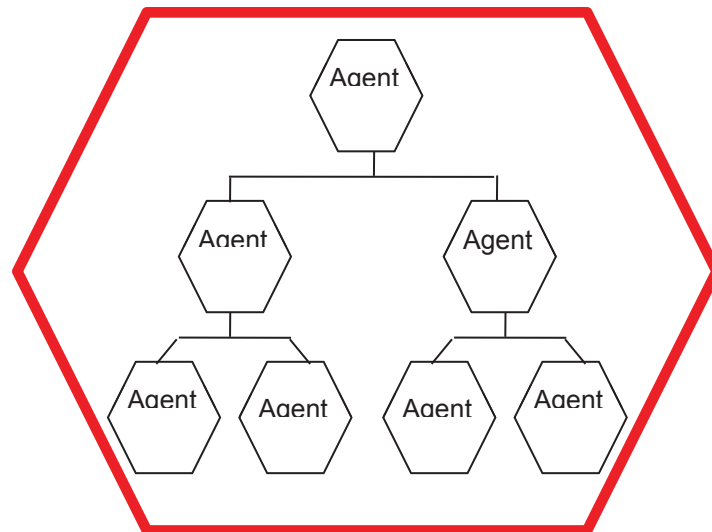


Fig. 4-2: simple agents collaborating in a hierarchal bee hive shape too perform tasks of high complexity
Source: Minsky, (1986).

Furthermore, MAS can manifest self-organization and complex behaviors even when the individual strategies of all their agents are simple. Agents can share knowledge using any agreed language, within the constraints of the system's communication protocol.

In 2010, Perini *et al.*, provided a conceptual model of an e culture system for the province of Trentino in Italy which could serve as an explanatory example of MAS. This e culture system shows how complex tasks could be decomposed into small simple ones, distributed among simple agents, each performing a defined and simple task. This example is extracted from a case-study which refers to the development of system including information obtained from museums, exhibitions, and other cultural organizations. It was the government's intention that the system developed could be used by a

variety of users, including citizens of Trentino and tourists looking for things to do, or scholars and students looking for material relevant to their studies. Such a big and complex task was decomposed into smaller and simpler tasks. Fig. 4-3 shows the five sub-tasks into which the e culture system was decomposed into. Each task was then assigned to a special agency.

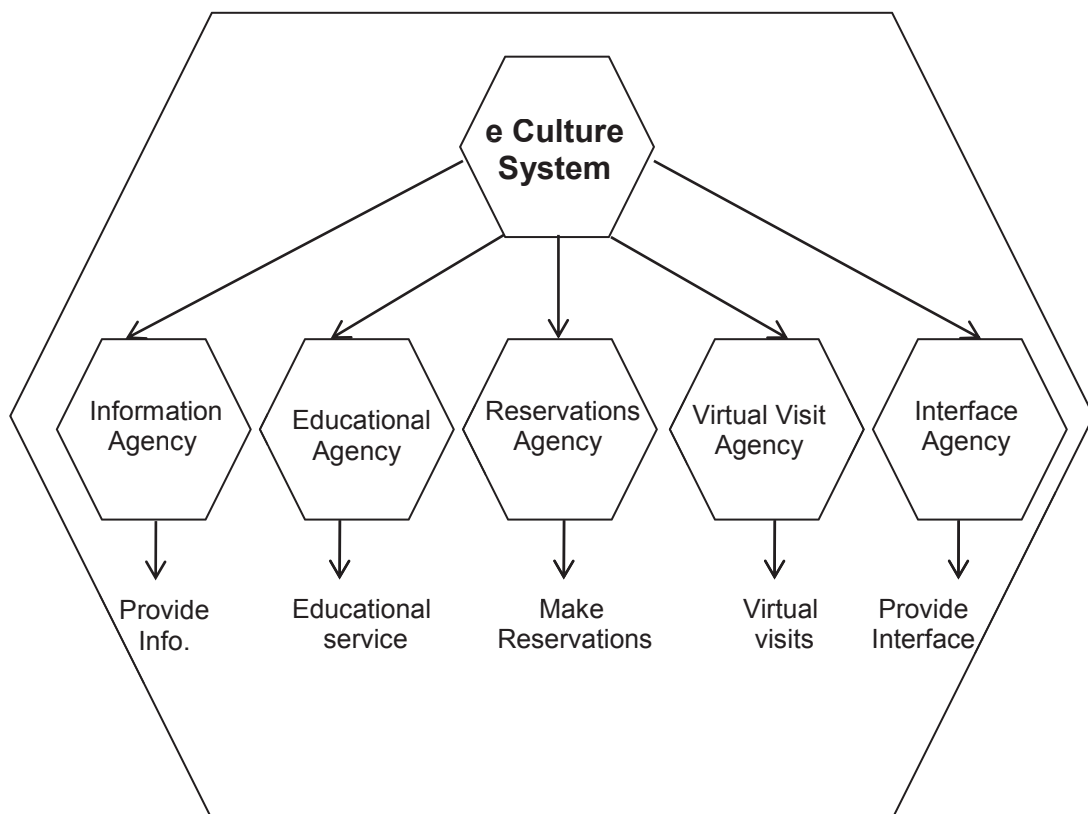


Fig. 4-3: Example of multi agent modeling (e culture system)

Source: Adopted from Perini et al. with modifications, 2010, with researcher modifications.

The degree of decomposition is unlimited. The model designer could make more than one level of decomposition, but from the digital point of view, the more decomposition of tasks, the much complex the model would become. This depends on the degree of complexity of the original task or problem and the vision of the modeler.

4.3 CONCEPTUAL BASES OF MULTI AGENT MODELING -MAM

The conceptual bases of MAM are the same as that of the Object Orientation, used for both analysis and design. The analysis application is mainly to define the problems, while the design application is to set a solution.

Object orientation analysis and design are the steps of the object oriented conceptual modeling. These two steps could further be detailed as follows:

4.3.1 OBJECT-ORIENTED ANALYSIS (OOA)

OOA is the process of defining the problem in terms of objects: real-world objects with which the model must interact and candidate human/software objects used to explore various solution alternatives, with the aim of producing a conceptual model of the information that exists in the area being analyzed. Analysis models do not consider any implementation constraints that might exist, such as concurrency, distribution, persistence, or how the system is to be built. (Martin Shoemaker, 2004).

Martin Shoemaker presented three required sources for OO analysis:

- requirements statements,*
- a formal vision document, and*
- interviews with participants, stakeholders or other interested parties.*

The distribution of the above required OO analysis in the research is as follows:

- PP principles are the “Requirement statements” that were presented previously in Chapter One. (See table 4-1).
- Proposed Success Criteria are “The formal vision document” provided in Chapters Two. (See table 4-2).

Table 4-1: summary of PP aims, principles and steps

Source: researcher (chapter one)

Requirement Statement (summary of analysis of PP -chapter one)	
PP aims	Empowering communities
	Empowering local governments
	Decentralization
	Improving transparency and trust
	Building capacity
PP principles	Public taking control over planning mission
	Decrease dependency on donor and organizer
	Enabling communities with all available techniques
	Diversity- transparency-equity-accountability
PP steps	Data Collection
	Internal structure
	Problem Analysis
	Learning
	Decision Making
	Self-correction

Table 4-2 : summary of proposed success criteria of PPP

Source: researcher (chapter two)

	Level of Participation	Time of Participation	Outcome of Participation
Planning Variables	Dependency	Tasks per person	Self-correction mechanism
	Ease of Practice	Learning process	Sustainability
Social Variables	Motivation	Commitment	Social organization
	Social exclusion	Technophobia	resources of PPP
	Social cohesion		Wide public acceptance
	Transparency/ trust		
Informational Variables	Awareness	Acquiring and Updating Information	Collaborative information system
	Transparency of Information	Problem-solution Data bank	Knowledge engineering process
	Interface	IT; empowering (Learning tools)	Community networking

- Questionnaires and Egyptian case studies are the “Interview with participants and interested parties”, presented in Chapter Five and a whole

conclusion for the model requirements and a description of what the model is functionally required to do, in the form of a conceptual model.

4.3.2 OBJECT ORIENTATED DESIGN OOD

If "analysis" means defining the problem, then "design" is the process of defining the solution. It involves defining the ways in which the system satisfies each of the requirements identified during analysis. (Martin Shoemaker, 2004).

OOD is a presentation of how the requirements of the OOA could be met. OOD provides the solution to the problems or answer to the requirements of the OOA. This could be done by defining the components, interfaces, objects, classes, attributes, and operations that will satisfy the requirements. (Martin Shoemaker, 2004).

This conceptual step has started in chapter three, where some solutions were deduced form the analysis of the biological oriented complexity science and cybernetics. These solutions together with the PP aims are elaborated in table 3-1 to form the targets of the desired PPP model and for each target there are principles that help reach that target. These principles are the backbone of the PPP model functions, and also the govern agents relation and collaboration.

The detailed design of the agents of the PPP model and their tasks will be further elaborated in chapter six using MAM languages.

4.4 MAM LANGUAGES

Pragmatically, implementing a model using (OO) or (ABM) needs a comprehensive language. Each of these methods has several languages. As for the former, the model description or schema requires a notation. Many notations have been proposed, based on different paradigms, diverged, and converged in a more popular one known as Unified Modeling Language (UML). (Wikipedia 2009). As for the latter, several languages have been used and there are rapid improvements and innovations in its field.

The most appropriate choice is the extension of the (UML) which is the Agent Modeling Language (AML). This modeling language was more elaborated by the Foundation of intelligent physical agents (FIPA) specifications, which certified the agent modeling language (AML) as a successful modeling language for Agent based system. Furthermore, AML is supported by more than a computer aided software engineering (CASE) tools. (FIPA, 2009).

These two languages could be defined as follows:

4.4.1 UNITED MODELING LANGUAGE (UML) DIAGRAMS:

UML is a graphical language designed to capture the artifacts of an OOAD process. It provides a comprehensive notation for communicating the requirements, behavior, architecture, and realization of an Object-Oriented design. (Martin Shoemaker, 2004).

In 1995, this language has evolved from the work of Grady Booch, James Rumbaugh, Ivar Jacobson, and the Rational Software Corporation. These renowned computer scientists fused their respective technologies into a single, standardized model. The UML then went through a few cycles of response and revision by the OO community; and UML 1.1 was adopted as a standard by the Object Modeling Group (OMG) in 1997. UML has been further refined, and is currently at version 2.0. (Wekipedia encyclopedia, 2009).

UML as a graphical language is based on diagrams. It is "very high level language" compared to high level language which is a generalized language used for any application rather than specific one.

4.4.1.1 Types of UML Diagrams

UML basically has nine types of diagrams divided as follows;

- a- Use case (function): use case diagram
- b- Static structure: class diagram and object diagram
- c- Behavior: state chart and activity diagram
- d- Interaction: sequence diagram and collaboration diagram
- e- Implementation: component diagram and deployment diagram

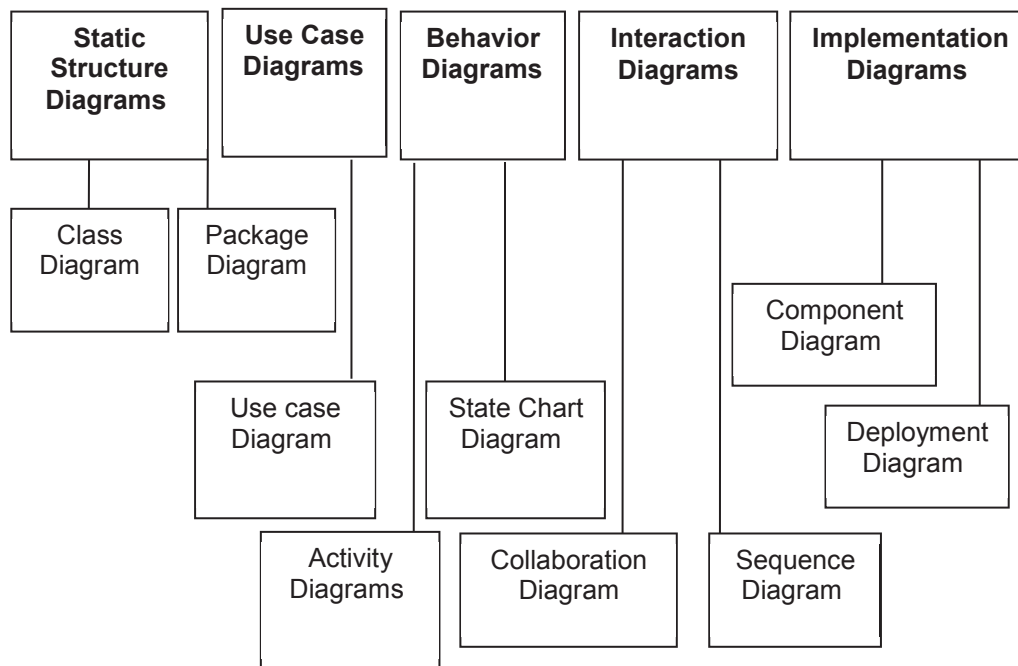


Fig. (4-4): UML diagrams
Source: researcher

a- Use case diagram: shows the functionality provided by a system in terms of actors, their goals represented as use cases, and any dependencies among those use cases.

b- Static Structure diagrams

Structure diagrams emphasize what things must be in the PPP being modeled:

Class diagram: describes the structure of a PPP by showing its classes, their attributes, and the relationships among the classes.

Package diagram: depicts how the PPP is split up into logical groupings by showing the dependencies among these groupings.

Since structure diagrams represent the structure of a system, they are used extensively in documenting the architecture of the model.

c- Behavior diagrams

Behavior diagrams emphasize the behavior of agents in the model. They show the functions of each agent within the PPP model.

Activity diagram: represents the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.

State chart diagram: it depicts how the state of the model changes in response to internal and external events. It is used to make sure that each event is handled properly no matter what state the model may be in.

d- Interaction diagrams:

Sequence diagram: shows how objects communicate with each other in terms of a sequence of messages. Also indicates the lifespans of objects relative to those messages.

Interaction diagrams (collaboration diagram), a subset of behavior diagrams, emphasize the flow of control and data among the objects and agents in the PPP being modeled:

e- Implementation diagrams:

Component diagram: it depicts the deployable units of the model, and the interfaces through which they interact.

Deployment diagram: it depicts how the deployable units of the model (applications, components, data stores, etc.) are assigned to various nodes, as well as how the nodes communicate with each other and with devices.

UML should have some sort of presenting the data to the computer, i.e. UML editor. To enable such facility, different editors have been developed; one of them is the "Smart Draw 4.0". It uses the nine types of diagrams to specify the PPP functionality at different levels.

This set enables presenting the whole cycle of PPP specification from the major requirements to final implementation phase.

Depending on Smart Draw tutorials, (the CASE tool that would be used in chapter six in the PPP model), **Appendix (C)** presents a detailed explanation of each of the UML diagrams, and to the notation and basic symbols used in drawing them.

4.4.2 AGENT MODELING LANGUAGE (AML)

Just as the agent based modeling is an extension of the OO modeling, and the agent is an extension of an object, the agent modeling language (AML) is a mere extension of the unified modeling language (UML) and idioms within UML. AML was designed to accommodate the distinctive requirements of agents within the UML.

The agent Modeling Language (AML) is specified as an extension to UML. It is designed to capture the aspects of Multi Agent Systems (MAS) and incorporate them into the analysis and design process.

"AML can be used whenever it is suitable or useful to build models that (1) consist of a number of autonomous, concurrent and/or asynchronous (possibly proactive) entities, (2) comprise entities that are able to observe and/or interact with their environment, (3) make use of complex interactions and aggregated services, (4) employ social structures, and (5) capture mental characteristics of systems and/or their parts."

(Cervenka et al, 2010)

So far MAM has been used to model digital systems. A hundred percent digital system would need 3 basic governing rules (constructs) added to the UML to regulate digital agents.

AML has specific constructs that when added to the UML would provide concrete architecture of the system modeled. This section provides an overview of specific AML constructs used to model the architectural aspects of multi agent aspects. These constructs are respectively; Ontology, Fundamental entity types and social aspects.

However the physical-digital nature of the PPP model compensates for those three constructs, were human agents govern the behavior of the model within pre-set governing rules (or protocols).

4.5 Brief

Chapter four identified MAM as the most suitable modeling type, conceptual level as the chosen PPP model level and UML as the language used in building the PPP model. The conceptual bases of PPP modeling are the Object Oriented Analysis and Design. OOA is still in need of applied case studies to cover PPP model requirements. This is presented in Chapter five. After OOA completion, OOD presents the detailed design of PPP model using UML graphical language and notations. OOD is presented in Chapter six.

Chapter five completes the OOA phase that started earlier in chapters one, two and three and presents the detailed requirements list for the PPP model design.

Martin Shoemaker presented three steps for the OOA stated before in chapter four as follows:

- 1-requirements statements,
- 2-a formal vision document, and
- 3-interviews with participants, stakeholders or other interested parties.

(Martin Shoemaker, 2004)

The third step is testing the *formal vision document* (success criteria presented in the research hypothesis and discussed and analyzed previously in chapter two) on two Egyptian case studies, one rural and one urban.

The analysis would record measurements of the **Level, Time and Outcomes** of participation in the two case studies, with detailed analysis of the factors affecting each of them. A participant's questionnaire is designed and used to record public impressions and evaluation of PP in the two case studies. In addition, the effect of each factor of the success of PP in each case study would be presented and participants' opinion of how to promote the success criteria in future PP application would also be identified. Analysis is presented in a comparison form. Conclusion of analysis ends with the formation of PPP model requirements table, together with the help of the previously deducted mechanisms to face the complexity nature of the PP -in chapter three.

This chapter is divided into three sections;

- 5.1 introduce the two Egyptian case studies and the data sources.
- 5.2 analyze the measurements and public evaluation of the three success criteria in the two case studies in a comparison form.
- 5.3 present a brief of the analyses of the proposed success criteria in the Egyptian Case studies and the summary of PPP Model Requirements.

5.1 SELECTION CRITERIA OF CASE STUDIES

The two case studies were selected to be as variant and different as possible. The difference between them (in the setting, number of inhabitants, number of participants, donor, PP methods and techniques, resources, etc.) would help study as much variant scenarios as possible affecting the success criteria of PPP which in turn would affect the model requirement to suit different cases peculiarity.

The first case study is a PP that took place in Egyptian villages in 2005, when the government decided trying an experience in development of rural areas through Participatory Planning as well as updating national maps using the GIS. Eventually, all villages in both Upper and Lower Egypt were distributed among consultants from local universities, and research centers. The researcher was a part of consultancy team working in a village in Lower Egypt, in "Qalyobia" governorate called "Beltan". Personal experience and involvement of the researcher in this village was the reason behind its selection as a case study that could represent Egyptian experience in Participatory rural development at that time. Generally, the initiation of that development was sponsored by the GOPP (General Organization of Physical Planning) and PP in "Beltan" village was given to the HBNRC "Housing and Building National Research Center".

The second case study is PP in Mansheit Nasser (MN), undergone jointly by MHUUC "Ministry of Housing Utilities and Urban Communities", "Cairo Governorate", "GTZ Egypt, German Technical Cooperation", financed by the "KFW, the German Bank for Development", supported in social matters by the ICA "Institute of Cultural Affairs", and supported in urban and planning matters by the IDG "Integrated Development Group".

A- Introduction to First case study: Beltan

“Beltan village” is a mother village comprising six satellite villages; “Zawet Beltan”, “El-Safa”, “El-Safaina”, El-Abadla”, “El-Gazawya”, and “Mansheit El-Ammar”.

Location and Hierarchal Regional and Administrative Subdivisions; Beltan village is located in Qalyobia Governorate. Qalyobia is located east of the Rosetta Branch of the Nile at the head of the Delta. It is Bounded on the north by the Dakahelya Governorate, on the north east by Sharkia, on the southeast by Cairo on the west by Menoufia and Gharbia governorates and on the southwest of Giza.(see fig. 5-1)

It comprises seven “Markaz”, nine cities, and 46 main villages, with 195 satellite villages and 901 hamlets (“Ezbah” and “kafr”). See fig. 5.3. (Abo-Elfetouh, 2006).

“Markaz Tookh” were Beltan belongs, has a total area of 212.85 km², forming about 21% of the area of Qalyobia governorate. It comprises 10 local councils, and one city “Banha” which is the capital of Qalyobia governorate, 29 villages and 163 satellite villages. (see fig.5-2)

Beltan Location and Hierarchal Regional and Administrative Subdivisions ;

Local council of Beltan Village is located in the north of “Markaz Tookh”, with total area of 182.7 km², which is almost 4.3% of the total area of the governorate. It is considered the northern gate to “Markaz Tookh”, where It is bounded on the North by “ Markaz Banha” , on the south by the city of “Tookh” and local council of “Kafr Mansour”, on the east by the local council of “Meet Kananh”, and on the west by the local council of “El-Ammar El-Kobra”. HBNRC, (2005).



Fig. 5.1: Qualubia Governorate and the 8 Marakez that comprise it.
Source: HBRC, 2005

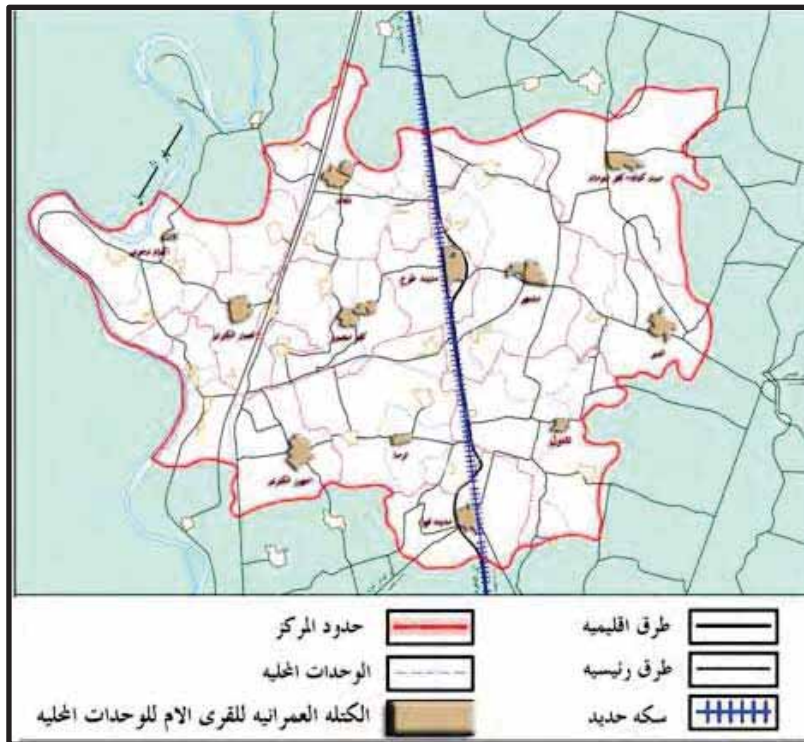


Fig. 5.2: Markaz Tookh and urbanized areas of existing mother villages.
Source: HBRC, 2005

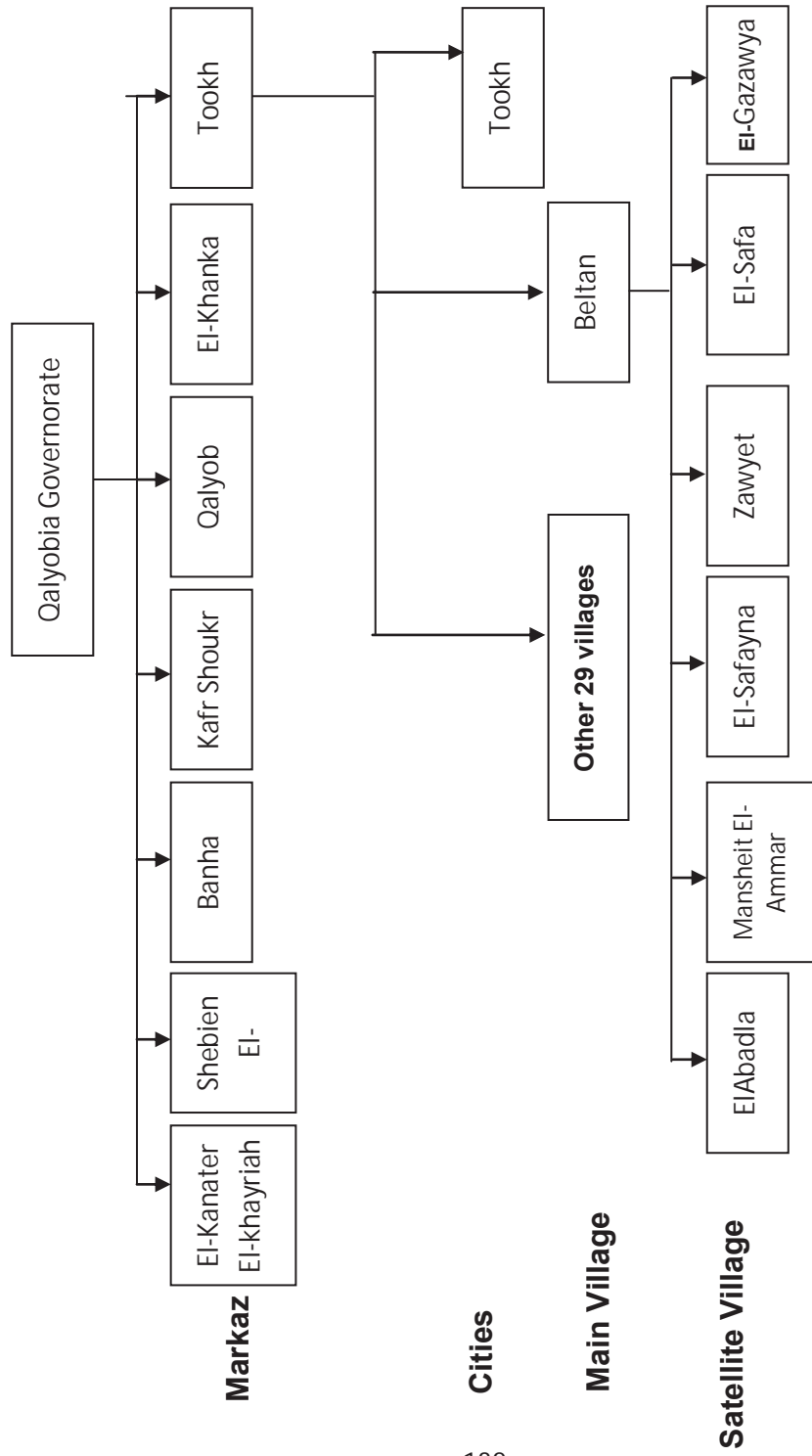


Fig. 5-3: Hierarchical subdivisions of Qalyobia Governorate
Source: Abou El fotouh, 2006

B- Introduction to Second case study; Mansheit Nasser (MN)

MN is located in the southern part of Great Cairo region.(See fig. 5-4). It comprises six sheiakhat; Ezbet Bekhit, El-Gamea, El-Masaken, Asfal El-Raza, Ala El-Razaz, El-Zarayib, El-Khazan, Maadisa, Wadi Faraoon.



Fig. 5-4: Satellite image of MN location in Cairo Governorate
Source: GTZ, 2005

Location and Hierarchal Regional and Administrative Subdivisions:

Mansheit Nasser is located in the west of Cairo Governorate, as for the geographical borders, it is bounded from the east by "El-Mokatam" mountain, from the west by "Salah Salem" road, from the north by "El-Tayaran" road and from the south by "Autostorad" road. (See fig. 5-5)

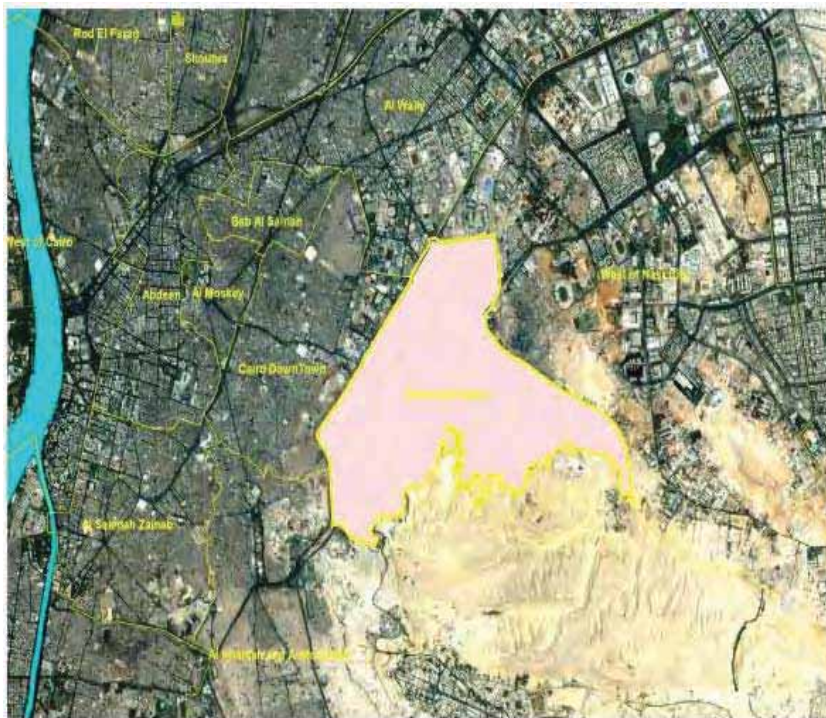


Fig. 5-5: MN borders
Source: GTZ, 2005

The "Autostorad" divides the district into two parts, first part west of autostorad until "Salah Salem", second part east of "Autostaurad" until "Elmoukatam" mountain. The area was early inhabited by those who were taken out of slum areas in downtown. by the end of the 60s, when their number augmented, president Gamal Abd El Nasser ordered the government to provide the area with infrastructure and utilities, and for this the area got its name after the late presidents moves. Total area of

"Mansheit Nasser" district is 934.7 Km², yet the inhabited area is 180 Km², because of the "Maukatam" mountain and the cemeteries.

Both case studies started 2005, so it would be an equitable comparison to evaluate outcomes of them after five years.

5.1.1 DATA SOURCES

- Literature review of PPP in Chapter two which identified the success criteria of PPP from multidisciplinary aspects as well as the factors affecting each aspect.

-Research Questionnaire which was designed to cover the success criteria from the three multidisciplinary aspects; Planning, Informational and Social. (See appendix D). This questionnaire was distributed to cover the majority of the participants in both case studies who took part in PP in 2005.

-TOR of PP in both case studies.

- Final report of PP issued by the HBNRC in the case of Beltan and by the GTZ in the case of MN.

-Personal experience in both case studies, where the researcher attended some public meeting and workshops during PP in MN, and was a team member of the HBNRC who performed PP in Beltan in 2005.

5.1.2 ANALYTICAL COMPARISON BETWEEN PP IN BOTH CASE STUDIES

The analytical comparison between the two case studies doesn't aim only at understanding the urban and rural Egyptian experience in PP, but evaluating their performance and achievements as well in reference to the PP principles, aims and functional steps.

There are several points of difference that would be specifically significant to enrich the proposed PPP model with different scenarios;

-Structural and organizational differences ;Setting, Initiation time, Time of the process, Area in which PP is taking place, Population , Organizer , Donor, PP Methods, and

-TOR and sequential steps,

-PP functional steps.

Table 5-1 previews briefly an analytical comparison between the two case studies showing major differences between the two case studies that

formed major reasons behind their selection as representatives of the Egyptian experience in participatory planning in both rural and urban areas.

Table 5-1: Selection Criteria (Major Difference points) for Case Studies

Source: researcher through TOR, GTZ, GOPP, 2005

	P.P. in Beltan	P.P. in MN
<u>Setting and Location</u>	"Qalubia Governorate" Rural area.	"Cairo governorate" Urban Slum Area.
<u>Compostion</u>	Beltan comprises (mother village with the same name) and seven satellite villages; El-GAzawya, El-abadla, El-Safayna, El-Safa, Manshaa El Ammar, and Zawet Beltan.	MN comprises 4 sheikhats; El-Gamea, El-Masaken, Asfal El Razaz and El-Moadessa.
<u>Population</u>	60816	156902
<u>Total Area</u>	182 KM2	78.3 KM2 ¹
<u>Duration</u>	2 months starting May 2005	9 months starting April 2005
<u>Initiator</u>	GOPP	-Cairo Governorate -The German Technical Cooperation (GTZ)
<u>Executor</u>	HBNRC "Housing and Building National Research Center".	-GTZ(as an overall supervisor) -ICA (social consultant) -IDG (urban planning and GIS consultancy)
<u>Donor</u>	Government of Physical Planning(GOPP)	-The German Bank of Reconstruction (KFW) -Japanese embassy -Various Government authorities.
<u>PP methods</u>	A tailor made PP method that depended on PRA basics, in a trial to meet local Egyptian village requirements.	PRA (Participatory Rapid Appraisal) LAAP ² (Local Area Action Plan).

-Beltan was an example of a sole Egyptian government initiative to the PP development, while MN was cooperation between many national and

¹ This is the area of the 4 shekhat and not the total area of MN

² LAAP is one of the workshop based methods of PP that depends on intensive workshops for participants to local problems and proposes solutions and action on local area map.

international entities. Nature of the initiator could have an impact on the success of the process, and which would be clearer after the evaluation of both case studies.

- Only one source of financing the project was present in Beltan, while many sources of finance was present in MN. This fact affected the outcome of PP in both case studies.

-Duration of project in MN was longer than that of Beltan by over the four times. This could be due to the great difference in population between the two, where population of MN was 2.5 times that of Beltan Yet this difference of duration would be useful in studying the effect of the time of participation on the success of PP after the evaluation of both case studies.

-PP methods followed in Beltan is one of the community based methods, while workshop based methods were followed in MN. Such a difference would help shed more light on the equivalent learning process that should be followed in the proposed PPP model.

Each of the case studies PP had its own terms of reference and its functional sequential steps as follows:

Terms of reference in both case studies shown in table 5-2 reveals the aims of PP organizer in both areas. While the GOPP apparent aim was to undergo a detailed study in Egypt's villages to determine social, economic and infrastructure needs taking the public knowledge as one of the main data sources in its study, the GTZ aim was to undergo a time limited (has a start and end date) development of MN through participatory planning on the basis of a detailed study undergone by the experts along with participants and depending on the public knowledge as one of the main data sources in its study

In Beltan, the key performer in such a study was the HBCR which was hired by the GOPP as the main consulter, while in MN, the key performer was a collaboration of various actors (Donor, Organizer, LPC, and NGOs) with the help of many participants and volunteers form the local area.

Table 5-2 presents PP sequential steps in both areas, that are further elaborated with a visual display in table 5-3. These two tables support the above mentioned aims of initiators in both areas as follows:

In Beltan, steps of performance were that of a professional detailed research that ended with a bunch of paper work and little development on the ground.

However, in MN, steps of performance were that of a very difficult and complicated PP development that started with introducing the program to the community, detailed workshops and ended with a lot of development Projects, in addition to a huge amount of studies and paper work that document the local PP experience and a large number of performed development projects.

Table 5-2: Sequential steps of PP in case studies.

Source: Researcher through TOR provided by GTZ, GOPP, 2005

	Beltan	MN
PP Sequential steps	1-Data Collection and First Meeting with Participants 2- Preparing Sectorial studies for each village 3- Data Analysis and meetings results 4- Problem and targets identification, and alternatives proposal 5- Village and Local Council Meetings and workshops	1-Knowing the local community and getting local community to know the P.P.P. team. 2-The local community organizes itself and integrates outside support. 3-Workshops 4-The local community assesses its needs on basis of previous studies and plans. 5- Urban Aspect (customization of solutions and plans with the help of professionals)

Table 5-3: visual display of Sequential steps of PP in both areas
Source: researcher, IDG, GTZ, 2005

PP in Beltan	PP in MN
 <p>Fig. 5-6(a): first meeting at the LPC of Beltan</p>	 <p>Fig. 5-7(a): Focus groups at the data analysis phase</p>
 <p>Fig. 5-6(b): second meeting in El-Gazawya at Sheikh El Balad guest house.</p>	 <p>Fig. 5-7(b): planning sessions in MN</p>
 <p>Fig. 5-6(c): third meeting at the LPC of Beltan</p>	 <p>Fig. 5-7(c): SWOT Analysis with ICA</p>



The TOR of the PP projects in the two case studies had its impacts on the functional steps followed in its application in the two case studies were some steps were missing, partial, or done with methods that contradicted with PP principles.

The six PP functional steps in both case studies are presented in table 5-4 as follows:

Table 5-4: Analytical comparison between PP steps in both case studies.
Source: Researcher, 2011.

	Beltan	MN
Data Collection	<p><u>Actor:</u> Housing and Building National Research Center (HBNRC).</p> <p><u>Description:</u> Local knowledge (from field surveys, four participants meetings and questionnaires) was the base of data collection along with other governmental data sources that was not updated.</p>	<p><u>Actor:</u> Participants, citizens and social and urban consultants (ICA and IDG).</p> <p><u>Description:</u> Local knowledge (from field surveys, various public meetings, Participatory Rapid Appraisal and questionnaires) was the base of data collection along with other governmental data sources that was updated.</p>
Internal Structure	<p>Participants of each village who were invited by each village LPC member/s and El-Omda, were summoned for four meetings to discuss all issues of their concerns and to settle on new urban borders for their village.</p>	<p>Public invitation to all citizens of MN took place through several public meetings and advertisement, then participants worked in each area separately and were divided into workgroups in round tables to for the LAAP.</p>

Problem Analysis	HBNRC analyzed problems using SWOT analysis. In addition to two other studies "Constrains" and "Capabilities".	Participants analyzed problems using SWOT analysis.
Learning	<ul style="list-style-type: none"> -No learning means were available. -Participants didn't know how to participate, what exactly is their role in the process. - Neither LPC members nor employees were trained to administer the proposed projects or even the new urban premises. -NGOs were excluded from participation, and eventually they didn't receive any training courses. 	<ul style="list-style-type: none"> -Participants attended training course on the Participatory Rapid Appraisal, and applied it in the four local areas. -Participants attended a "Participatory Planning" training course to get familiar with and LAAP. By the end of this stage, detailed action plans, with all responsibilities and roles identified. -LPC members attended GIS courses to update and record urban changes. -NGOs also attended vocational trainings to be able to perform some of the proposed projects.
Decision Making	<ul style="list-style-type: none"> -Participants proposed projects resulting from meetings and Questionnaires. -HBRC Identified fundamental issues for each village development through activities and projects proposed. -HBRC determined targets through proposed projects and activities in every development field. -No Public or participants voting for final decisions being taken. 	<ul style="list-style-type: none"> -field verification of proposed solutions and knowing local capabilities -presenting proposed plan to the local authorities and the professionals -strategic planning sessions with urban planners professionals and the IDG. -professional committees in all development fields; local security and administration, social, economic, urban, environmental and infrastructure and utilities. -No Public or participants voting for final decision

Self-correction	<p><u>Monitoring:</u> no monitoring for the outcomes of PP in Beltan took place</p> <p><u>Evaluation:</u> no evaluation of outcomes of PP in Beltan took place.</p>	<p><u>Monitoring:</u> GTZ monitored outcomes of PP in MN until 2008</p> <p><u>Evaluation:</u> no public evaluation for PP in MN took place, but rather a public acceptance survey on the services and facilities presented by the LPC after the project was undergone.³</p>
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In Beltan, self-correction mechanism didn't exist at all, while in MN it existed in a linear form, unlike the cyclic mechanism. (See fig. 5-8 and also chapter one)

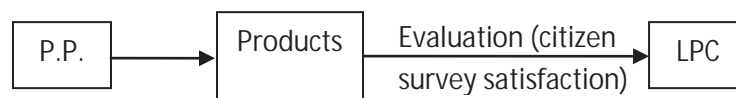


Fig. 5-8 : Linear Self-correction Mechanism in MN
Source: researcher

5.2 TESTING SUCCESS CRITERIA IN CASE STUDIES

A questionnaire is used to test the success criteria in both case studies, along with the GTZ and the HBNRC final reports of PP in both MN and Beltan successively. Also an interview with the GTZ advisor “Mr. Khalil Shaat” was necessary for the clarification of some details about the PP in MN, while in Beltan, it wasn’t necessary, since the researcher was one of Beltan’s planning team.

³ Nevertheless, in MN, the GTZ had undergone a "citizen satisfaction survey". This survey studied citizen satisfaction concerning 6 services that are most important to the LPC. These services are; markets, citizen complain center, water and sewage, solid wastes and employment center. Citizen satisfaction was monitored from several aspects; awareness of the service, offering of service, and using the service, accessibility of service, proximity of service, awareness of service improvement and service quality. In addition recommendation of the citizen on how to improve the service was also included. This survey was handed to the LPC.

The questionnaire is designed to test the three success criteria in both case studies from the three examining aspects; Planning, information and social.

The full format of the Questionnaire is provided in [appendix D](#).

The questionnaire is composed of four sections.

- The first section is covering general information about the participant.

The other three sections are covering the success criteria of the PPP from three aspects each; Social Informational and Planning.

- the second section is covering questions about “Level of participation”.

- the third section is covering questions about “Time of Participation”, first generally and then from the three previous aspects.

- the fourth section is covering questions about “Quality of Participation”.

The first section of the questionnaire was distributed among residents of both case studies who didn't participate in the PP, to investigate reasons of not participating, if it was because of unawareness, lack of time, or other reasons.

A complete questionnaire including all four sections was distributed among participants of both case studies to investigate the success criteria and the proposed biologic PP from Chapter 3.

A simple random selection was used to choose those who answered the questionnaire. Sample size in Beltan recorded 70% of total number of participants, while that of MN recorded 25%⁴.

Results of the test of the success criteria are presented in a comparison form to clarify the difference between the two case studies.

⁴ This percent doesn't represent those who didn't participate and answered the first section of the questionnaire.

5.2.1 LEVEL OF PARTICIPATION IN CASE STUDIES

“Level of participation”, is concerned with the percent of participation, and its variety and representation to the various local community sectors in the two case studies. Women and youth representation are of special interest in the two case studies, for the vulnerability of the former and the high percent of the latter.

Referring to the percentage of participation, as was mentioned before in chapter 2, it is meant to be the percent of participants who participated in the P.P.P including local popular council members, to the total population.

$$\% \text{ participation} = \text{no. of participants} \times 100 / \text{population}$$

This percentage doesn't include the donor of the process, nor the organizer. Also it doesn't include external government members who were supervisors of the process nor the urban planner's team who was in charge of consultancy/data collection in the process. Table 5-5 presents the percentage of participation in both case studies as follows:

Levels of participation in Beltan the mother village and the satellite ones were minimal to a great extent, average participation of local citizens recorded 0.002%. In MN, number of participants was constant (385), unrelated to the population of each shiakha.⁵ Average participation of local citizens recorded 0.009% which is more than four times the level of participation in Beltan.

⁵ Participation in MN differed in each planning phase. For data collection, 50 participants in each sheiakha worked with the ICA, then they formed 20 focus groups, each group is composed of 5 participants. For the "Needs Assessment", 15 participants in each sheiakha distributed 200 questionnaires. For planning sections, 20 persons in each sheiakha, and for the public hearing, around 200 participants attended public meeting. Khalil Shaat, GTZ Advisor. Interview, 2010.

Table 5-5: level of participation in percentage in both case studies
Source: HBRC, 2005 (Beltan) / ICA, 2005 (MN)

Beltan		MN	
Name of village	Level of Participation (percentage)	Name of Sheiakha	Level of Participation (percentage)
Beltan	0.0005	Elmasaken	0.0088
Zawet Beltan	0.0026	Asfal Elrazaz	0.0089
El-Safaina	0.0032	Elmaadesa	0.0098
El-Safa	0.0013	Elgamea	0.0098
Gazawya	0.0042		
El-Abadla	0.0005		
Manshaa Al Ammar	0.0020		
Average	0.0020	Average	0.0093

As for the Community representation, in Beltan the PP application contradicted with the TOR of the village development project which was more specific in identifying the variety of participants rather than the percentage of participants. Real participation in Beltan was among the common local citizens, which formed the majority of the participants taking part in the process. The participation of the local government sector was limited to the Local Popular Council (LPC) members. As for the educational sector, its participation wasn't in the form of schools with its administration, teachers and students, but rather in an individual form were some teachers participated, not with their institutional identity, but with their patriotic identity as local citizens. Neither the private sector took part in the process (either in the planning matters or in financing the process), nor the NGO's, though there were two NGO's efficiently working in Beltan as mentioned by the citizens in the research Questionnaire.

In MN, community representation was very clear in the TOR of which stated that; *"Representatives of local civil society, local business and local administration will be able to implement available tools of participatory urban upgrading on their own. They will develop their own concepts to improve their environment, livelihood and access to services"*.

GTZ, 2005

Participants in MN were from students, youth, NGOs representatives, LPC representatives and common citizens.

Woman and youth representation was missing in all villages of Beltan except in "Zawyet Beltan", where it formed 31% of total participants. Generally woman participation in Beltan formed 8%. Children were excluded from participation as well as illiterates, handicapped and all the disadvantaged.

On the other hand, in MN, the TOR mentioned that

"Of particular importance is that women, youth and tenants are represented (50%)". Pragmatically Women representation reached an average of 40% and youth reached 30% from all participants.

The previous levels of participation in both case studies were minimal to a great extent. It could be useful to discuss the reasons behind such percentages by analyzing "level of participation" factors from the three aspects; Planning, information and social, on both case studies.

Level of Participation from the Planning Aspect:

From the planning aspect, there are two factors affecting "Level of Participation" that were discussed earlier in chapter two. ; "Dependency" and "Ease of Practice".

-The higher the dependency of PPP on the donor to finance the whole project and on the organizer to organize the community and to administer the project, the less successful it is.

-However, the easier the practice of the participatory planning, the more successful it is.

Table 5-6 presents the percentages of those two factors in the case studies according to the research questionnaire and the analysis of impacts of these percentages on the level of participation.

Table 5-6: Testing “Level of Participation” factors from the Planning aspect in both case studies

Source: researcher on basis of research Questionnaire and final reports of HBRC and GTZ, 2005

Beltan	MN
<u>a-Dependency</u>	
on Donor: 67.5% on organizer: 69.1%	on Donor: 70% on organizer: 53%
The organizer was the main actor in the PP project in Beltan while Participants played a minor role. Participants took part in data collection in an indirect way in the form of a questionnaire that was distributed among them to get to know their problems and their urban, natural, social and economic environments. On the other hand, Participants didn't take part in data analysis, SWOT analysis or even the solution proposals, prioritization and final decisions.	Though the TOR mentioned that the consultant should not play a controlling role in the project and that He/She shall act as a catalyst and an honest broker between local stakeholders, and though participants played a great role in data collection, problem identification, SWOT analysis, prioritization and solution proposals, yet the dependency on the donor and organizer was high due to the difficulty of the learning process and the deficiency of internal resources to finance proposed projects.
<u>Ease of Practice</u>	
55.7% of the participants recognized PP as a non-easy one.	62% of the participants recognized PP as a non-easy one.
It is clear that this percentage is not a reflection of illiteracy percentage in the village, where none of the participants were illiterate. Rather it refers to the fact that they had no introduction or any kind of training, workshops given and no clear image of the process (what was asked from them and what was expected as an outcome or even a printed brief of the process and its steps). This unclear image of PP projects helped decreased the level of participation.	It is clear that this percentage is not a reflection of the illiteracy percentage in MN, where none of the participants were illiterate. Rather it refers to complicated procedures of the process, prolonged workshops, over information presented to participants and un-equivalence level of data to participants cultural and educational background (20% of participants reported that information presented to them was incomprehensible).

Level of Participation from the Informational Aspect:

From the informational aspect, there are three factors affecting “Level of Participation” that were discussed earlier in chapter two. “Awareness”, “Quality of information” and “interface”. Each of these factors is summarized below with a particular survey in some of them, before the analytical comparison of its application in both case studies as follows:

a-Awareness

This factor is concerned with the level of awareness of the existence of PP among inhabitants in each case study. Table 5-7 presents awareness levels in both case studies.

An investigation was undergone through the research questionnaire to determine the most efficient means to raise the awareness of PP and the result was as shown in the table 5-8.

according to the research questionnaire, In Beltan, “advertisement in mosques” and “flyers distribution” recorded the highest levels of preference among participants, while in MN, “flyers distribution” and “Participatory Education in schools” recorded the highest two means suitable to raise awareness of PP.

Table 5-7: Testing “awareness” in both case studies and its effect on “Level of Participation” form Information Aspect.

Source: Research Questionnaire

Beltan	MN
<u>a-Awareness</u>	
Awareness of Existence of PP: 32 % -for those who didn't participate, Reasons for not participating: Didn't know=100% Didn't have time=0%	-Awareness of Existence of PP: 53 % -for those who didn't participate, -Reasons for not participating: Didn't know=38% Didn't have time=62%
All those who participated knew about the process form the mayor of their village (El-Omda) or a local council member. There were no brochures, paper works, and advertisement of any sort for PP taking place.	Some participants knew of the process form their jobs in local NGOs, others form the publicity done for the project from the GTZ, were they printed flyers and had undergone many public meetings

Table 5-8: Means to raise Awareness of PP according to participants in both case studies

Source: Research Questionnaire

Level of Preference	1	2	3	4	5	6	7	8
Beltan	Mosques and churches ⁶	Flyers	T.V	Radio	News-paper	local Magazines	Inter-net	Participation Education
MN	Flyers	Participation education	local Magazines	Mosque and church	News-paper	T.V.	Inter-net	Radio

b-Quality of information

This factor is trying to measure the degree of trust, sufficiency and comprehensibility of the information presented/circulating among participants during PP. The research questionnaire formed an investigation on how participants assessed the quality of information in both case studies. The result of this investigation is presented in table 5-9 below.

Table 5-9: Testing “Quality of information” in both case studies

Source: Research Questionnaire

<u>b-Quality of Information</u>		
Negative comments	According to research questionnaire,	
	Beltan	MN
Information in the P.P. was insufficient.	13.5% ⁷	37%
information in the P.P. was not trust worth	14.3%	37%
Information in the P.P. was incomprehensible.	14.3%	20%

⁶ There were no churches in Beltan, but there were churches in MN, so the question has to be generalized to cover both Muslims and Christians in both case studies.

⁷ Percentages presented shows those who were not positive about the quality, so 86.5% reported information to be sufficient, and so forth in the rest of presented percentages.

c- Interface

Face to face intervention through the meetings that were held, and the questionnaire that was distributed among participants were the two means of communication used in PP that took place in both case studies.

Though computers weren't used, yet it is useful for the model proposed to know the reaction of participants living in both urban and rural areas towards participation through computers and its various interfaces if it was offered to them. A survey on the popular acceptance to computer interfaces was undergone through the research questionnaire in both case studies and the results are presented in table 5-10.

Table 5-10: Public acceptance of computer interface according to participants in both case studies

Source: Research Questionnaire, 2010.

computer interface	Interaction through images	Interaction through shapes by touch screens	Voice interface and recording
Beltan	21.3%	24.2%	54.5%
MN	40%	22	27%

Level of Participation in Beltan from the Social Aspect:

From the social aspect, there are four factors affecting “Level of participation” that were discussed earlier in chapter two; “Motivation”, “Social Cohesion”, “Transparency and Trust” and “Social Exclusion”.

Each of these factors is tested in the applicability of the two case studies in table 5-11 below.

Table 5-11: Testing “Level of Participation” factors from the Social Aspect in both case Studies

Source: Research Questionnaire, 2010, HBRC, 2005, ICA, 2005.

a-Motivation	
Beltan	MN
Most participants who took part in PP in Beltan were motivated to do so in order to legitimize their land and incorporate it into the new proposed urbanized area. It is also worth mentioning that some participated for the development and benefit of their village. No financial support or promises of any reward was given to them, which makes their participation of the pure volunteer type.	Most participants who took part in PP wanted to legalize their ownership of their houses. Some participants (mostly students) took part after knowing there was a reward form the GTZ (then they quit when they knew it was not true), few (those who worked in local NGOs) were motivated to take part in the process to gain experience in their practical field and mostly to get donations from the GTZ, and some participants took part in the process for the development and benefit of MN.
b-Social Cohesion	
Beltan	MN
100%	88%
This percentage could be a reflection of the rural social nature in Egypt, were most local people know each other, share same aspirations and have the same problems	This is a high percentage taking into consideration that MN has a wide variety of emigrants, mostly from upper Egypt.
c-Transparency and trust	
According to the research questionnaire, participants identified the process to be;	
69% transparent	24% transparent
Contrasting with this percent, none of the participants knew that this process was not given any budget from the government	Though participants had an immense trust in the GTZ (being an outside financial coordinator with no interest except the charity works),

<p>except the money given to the consultants, universities and research centers who performed the process with the villagers. Also governmental intensions behind this public participation planning was questioned by many participants because of its close timing to the presidential election in 2005, were some suspected governments conspiracy just to gain local popular support.</p>	<p>there was a lack of trust between the ICA (social consultant) and the participants.⁸ In addition, Participants didn't know the budget that was set form the KFW to the process, and they were not given the opportunity to choose which projects of highest priority and needed urgent execution.</p>
<p>d-Social Exclusion</p> <p>According to the research questionnaire, participants, think that</p>	
<p>Beltan</p>	<p>MN</p>
<p><u>Illiteracy</u> has the highest negative effect on the level of participation, then <u>poverty</u> and third <u>unemployment</u>.</p> <p>-Illiteracy: Average level of illiteracy in Beltan recorded <u>26% in 2005</u>. Participation in Beltan was through the questionnaire, which was in a written format. Consequently all illiterates were excluded form participation.</p> <p>-Poverty: Participants identified "Poverty" to have a negative effect on the level of participation. There is no data available on the average income of the family in</p>	<p><u>Illiteracy</u> has the highest negative effect on the level of participation, then <u>unemployment</u> and third <u>Poverty</u> which is of no effect on the level of participation</p> <p>-Illiteracy: Average level of illiteracy in MN recorded <u>27% in 2005</u>. It is a very critical percentage reveling that 27% of population were completely excluded form participation in the project and still no program was there to reduce number of illiterates.</p> <p>-Poverty: Though poverty prevails in MN, and though the Final report of the ICA showed that 36% of population is without permanent income, also the area</p>

⁸ There were several incidents that lead to this mistrust, for example; participants thought there was a rewarded in return to their participation, which didn't happen. Another example is a report issued by the ICA describing the local area of El-Gamea to have prostitute houses and out of law drug dealers, which the participants thought it is completely not true and unfair.

<p>Beltan at that time, but the final report of the HBNRC shows that People of Beltan had poor access to clean water and health services, most of them have no access to healthy water and sewage systems and various other utilities.</p>	<p>had poor access to clean water and health services, and most of them have no access to healthy water and sewage systems and various other utilities, yet, participants think poverty is of no effect on the level of participation.</p>
<p>-Unemployment: Average level of unemployment in Beltan and its satellite villages recorded 12.03 % in 2005. Unemployment had little effect on the level of participation in this case were those who participated were the selected and invited persons around the social circle of the LPC members and el-Omda.</p>	<p>-Unemployment: Average level of unemployment in MN recorded 33 % in 2005. this percentage affected the level of participation positively were because the non-easy practice of methods used to perform the process needed a lot of time form participants and thus needed an unemployed citizen! This analysis is backed up the percent of citizens who knew of the project, but didn't have time to participate which formed 62%.</p>

An investigation through the research questionnaire helped to form a record of which mattered most to the participants from the social aspect factors, and which factor/s are most influential to the “Level of Participation”. Table 5-12 shows records that trust and transparency as the most influential factors, in both case studies, and in MN motivation ranked second due to their expectations to receive financial support from the GTZ.

All social exclusion sub-factors are negatively affecting the “Level of Participation” which makes their eradication a pre-start request for any PPP to reach high levels of participation.

Table 5-12: Degree of influence of each social aspect factor affecting “level of participation” according to the participants.

Source: Research Questionnaire, 2010

Social aspects factors affecting level of participation	Motivation	trust transparency	Social cohesion	Social Exclusion		
				poverty	illiteracy	unemployment
Beltan	3 rd	1 st	2 nd	Negative influence		
MN	2 nd	1 st	2 nd	Neutral	Negative influence	

5.2.2 TIME OF PARTICIPATION IN CASE STUDIES

Time of participation is meant to represent the time of participation for each participant. It is calculated by taking the average time of participation of participants in a PP project⁹, or as the average time a participant contributes to the project per day. Table 5-13 shows average time of participation in both case studies. In Beltan, the average time of participation recorded 5 hours in two month time, or 5 minutes per participant per day, while in MN, time of participation recorded 136 hours per participant in nine month, or 30 minutes per participant per day.

Public evaluation to the time of the project in Beltan showed that most participants were satisfied with the two month time of the project, and thought it was enough to reach its aims, while in MN, participant’s evaluation was neutral. Table 5-14 shows percentages of participant’s evaluations as follows:

⁹ PP project is used here because the two case studies were not of the proposed sustainable “process” type.

Table 5-13: Time of participation by hour per participant in each case study.
Source: Research Questionnaire, 2010

Time of participati on/village	Time of Participati on	Time of participati on/village	Time of Participati on
Beltan	5.8 h/p	El-Masakem	111 h/p
Zawet Beltan	4.8 h/p	El-Madessa	147 h/p
El-Safaina	6 h/p	El-Gamea	135 h/p
El-Safa	4.6 h/p	Asfal el Razaz	154 h/p
Gazawya	7.5 h/p		
El-Abadla	4.2 h/p		
Manshaa al ammar	3 h/p		
Average	5.12 h/p Or 5 min/p/day		136 h/p Or 30 min/p/day

Table 5-14: Participant's evaluation to Time of Project in both case studies
Source: Research Questionnaire, 2010

Evaluation categories	Beltan	MN
Time of the PP project	Two months	Nine months
The average time of participation per participant in PP project, during the whole period of the project	5.12 hours.	136 hours.
Participants evaluation to the time of the whole project, according to the research questionnaire:		
-participants who thought that PP took just the right time	56 %	33 %
-Participants who thought that PP took longer than it should	28 %,s ¹⁰	- 33 % ¹¹
-Participants who though that PP didn't take enough time.	- 16 %	- 33 %

The great difference in the time of participation per participant in the two case studies has many reasons. . It could be useful to discuss the reasons behind such a difference by analyzing "Time of participation" factors from the three aspects; Planning, information and social, on both case studies.

¹⁰ Reason for taking longer than it should in Beltan is mainly due to the unawareness of participants and the long time interval between meetings

¹¹ Reason for taking longer than it should in MN is mainly because of the few number of participants.

Time of participation from the Planning Aspect:

From the planning aspect, there are two factors affecting "Time of Participation" that were discussed earlier in chapter two; "Tasks per participant" and "Learning means". Table 5-15 presents a test to each of the above factors applicability in the case studies.

a- Tasks per participant

This factor is divided into two parts. The first is about the scope of participation i.e., the kind of development/problems whether social, urban, economic or environmental that each participant took part in.

The second other part is about the different phases of PP (data collection, problem identification, problem analysis, problem prioritization, solution alternatives, strategic planning, evaluation and monitoring) that each participant took part in.

The less the number of problems a participant participates in, the more dedicated and committed the participant would be, the less "time of participation" is, and the more convenient and easy it is for participants to be more committed to their tasks.

On the other hand, the more participation phases a participant is committed to, the better for the quality of decision making and the result and quality of outcome of participation. It is better that the participant who collected information is the one who analyses it, and the one who proposes solution and alternatives for it. Also it is not very useful to propose solutions to a problem with little knowledge of the reasons behind it. This is the case for those who just proposed solutions without participating in the two first phases of data collection and analysis.

b- Learning means

This factor investigates the learning means by which participants knew how to take part in PP in Beltan, no learning means was given to them, while in MN, intensive training courses was given to participants.

An investigation through the research questionnaire was done to record the most preferable, practical and easy learning means to participants in the two case studies, showed that in Beltan participants preferred learning in workshops, while in MN participants preferred learning by doing. Such a result reveals that the type of learning means given to participants in both case studies failed to their aspirations. Neither absence of any explanation, nor intensive workshops are useful and practical. A simple manual guide could be a better learning means, and most of all, practice makes perfection.

Table 5-15: Testing “Time of Participation” factors from Planning Aspect in both case studies
Source: Research Questionnaire, 2010

a-Tasks per Participant		
	Beltan	MN
<u>Number of PP phases</u>	<u>-Percent of participant who took part in PP phases</u>	
One phase	18%	33%
Two phases	9.3 %	25%
Three phases	21.8	25%
Four phases	28.1	16%
Five phases	21.8	1%
<u>Number of problems</u>	<u>-Percent of participant who took part in Problems</u>	
One problem	30.5%	54%
Two problems	36.1%	37%
Three problems	22.2 %	8%
Four problems	5.5%	1%

<u>b-Learning means</u>	
Beltan	MN
PP in Beltan didn't perform any kind of workshops before or through the process directed to neither community leaders (El-Omda), and the local NGOs, nor to the local inhabitants. The TOR did include it, but the application missed it.	PP in MN held introductory meetings for all involved, workshops for participants, field visits for data collection, and meetings with professional and urban planners and public meetings for the announcement of PP results.

Time of Participation from the Informational Aspect:

From the informational aspect, there are three factors affecting "Time of Participation" that were discussed earlier in chapter two. "Acquiring and updating information", "Problem-Solution Data Bank" and "IT learning tools". Each of these factors is summarized below with a particular survey in some of them, before the analytical comparison of its application in both case studies shown in table 5-17.

a- Acquiring and updating information

This factor discusses the data sources in both case studies, and whether or not it was updated and how.

b- Problem solution data bank

It is a list of solutions that could be useful in solving a certain problem which was used in other places.

c- IT learning tools (communication tools)

The preference on various communication tools (like face to face intervention, public meetings, boxes, sequential accumulative tasks, Tele-video, sms-mobile phones, e-mail and web based communication) was investigated in the research questionnaire. Results in table 5-16 below, shows that face to face intervention and public meetings were the most preferred learning tools, while e-mail and web-based communication ranked last.

Table 5-16: Preferred communication means according to participants in both case studies

Source: Research Questionnaire, 2010.

Communication tools	Face to face	Public meeting	Boxes	Sequential accumulative tasks	Tele-video	Sms-mobile phones	e-mail	Web-based
Degree of preference in Beltan	1st	2nd	3rd	6th	5th	4th	8th	7th
Degree of preference in MN	1st	2nd	3rd	4th	5th	6th	7th	8th

Table 5-17: Testing “Time of Participation” factors from Informational Aspect in both case studies.

Source: Research Questionnaire, 2010.

a-Acquiring and updating information	
Beltan	MN
Data sources	
<p>Urban and Planning Information sources:</p> <ul style="list-style-type: none"> -the center of information and council of ministries. -LPC, -institute of village building and development, -Ministries concerned with village development.(agriculture, irrigation,etc.) - CAPMS -Field survey -Local meeting with villagers and the questionnaire (previously set in the TOR) that was distributed among the participants. <p>Social information sources:</p> <ul style="list-style-type: none"> - CAPMS 	<p>Urban and Planning Information sources:</p> <ul style="list-style-type: none"> -Previous studies (strategic plan, guiding plan...etc) -CAPMAS -Satellite images -Information on services and utilities form concerned governmental authorities -Geographic maps. -Field survey <p>Social information sources:</p> <ul style="list-style-type: none"> -10 Individual and 10 group field visits. -Youth center, -health unit, -schools, -culture centre, -ministry information center, -guided and detailed plan of the area. -Questionnaires.
Data updating	
<p>Little effort was done, concerning both social and urban data updating. Urban studies depended on aerial maps which dated back to the 70s, and no recent satellite images were bought. Social data (population, illiteracy,</p>	<p>Information provided, used and issued during PP was updated to a great extent. Urban data depended on 4 sources (mentioned above) all of them were recent, and the social and economic data was updated by the ICA and the participants through</p>

women labor, etc.) and economic data (labor sectors, unemployment productivity), depended on information from the CAPMS which dated back to 1996. No field surveys to update information taken from CAPMAS were done.	the PRA and the excessive field visits.
<u>b-Problem-Solution Data Bank</u>	
There was no problem solution data bank presented to participants in both Beltan and MN,	
In addition no similar examples were presented to them. Problems were specified by participants in the questionnaire and in the meeting, while solutions were proposed by the HBNRC team and presented to participants.	However, there were similar examples, presented to them through their visit to "El-Darb El Ahmar" as there was PP undergoing there with the supervision of Agakhan. All solutions were proposed by the participants, and then presented to the professionals to study its suitability and applicability.
<u>c-IT learning tools</u>	
In Beltan, GIS was used by the HBRC team, but was neither introduced to participants nor the LPC members.	Some participants and LPC members and students were introduced to GIS through a course given by the GTZ

Time of Participation from the Social Aspect in both case studies:

From the social aspect, there are two factors affecting "Time of Participation" that were discussed earlier in chapter two; "Commitment" and "Technophobia".

a-Commitment

There were no records of the percentage of commitment among participants during the participants meetings that were held in in both

areas. In the research questionnaire, an inquiry about individual participant's commitment was investigated. Results are shown below in the table 5-18

b- Technophobia

As there was no IT means introduced in both case studies, an investigation was undergone through the research questionnaire, to identify reaction of urban and rural communities, if technological means were used in PP. Results are shown in table 5-18. The rural response to IT means showed higher levels of acceptance than that of the urban, though both showed a relatively high acceptance.

Table 5-18: Testing “Time of Participation” factors from Social Aspect in both case studies

Source: Research Questionnaire, 2010.

a-Commitment		
	Beltan	MN
Commitment level	-Percent of participants	
Highest	84.2%	4%
Medium	10 %	79%
Minimum commitment	2.7%	16%
b-Technophobia		
	Beltan	MN
Expected response to IT	-Percent of participants	
Great enthusiasm	94.8%	4%
Neutral	2.5 %	79%
technophobia	2.5%	16%

5.2.3 OUTCOME OF PARTICIPATION:

Unlike level and time of participation, outcome of participation is not easy to measure, and in some aspects it is even un-measurable. This doesn't make it an implicit success criteria, but it rather makes it the most difficult to achieve. This is because it doesn't need the application of certain policies like that of the level and time of participation to reach high levels, but it rather needs collaboration and synergy between are actors involved to reach anticipated outcomes of PPP.

Outcome of participation from Planning Aspect:

From the planning aspect, there is one factor affecting "Outcome of Participation" that was discussed earlier in chapter two; "Sustainability". The Product oriented development that took place in both case studies should still be evaluated by the kind of projects executed and their percentage to the whole number of projects proposed by PP. Accordingly, the kind of projects that were executed reveals the development fields of high priority according to the donor, since the participants had little choice of what to be executed in both case studies. A brief evaluation about projects execution is presented in table 5-19. A full preview of projects according to various development fields that were most in focus in both case studies is presented in [appendix E](#). Monitoring and of proposed projects and executed ones in each case study is presented in [appendix F](#).

Sustainability

As mentioned before in chapter 2, sustainable PP is a cyclic process. It aims at sustainability of the P.P., and not for pre-set products. Therefore, this factor is looking for an NGO, or an institution that still performs PP in the area as a successor for the original organizer. This factor doesn't look for physical outcomes, like a school built, or a road paved, but it looks for

participatory planning sustainability though any groups of people or local organization.

Table 5-19: Testing “Outcome of Participation” factors from Planning Aspect in both case studies

Source: Research Questionnaire, 2010.

<u>a-Sustainability</u>	
Beltan	MN
<p>After five years, there is no trace of PP of Beltan in 2005 to the time this research is being done. No workshops took place then, and not until 2010, no leaders were discovered and trained, no projects performed and even not a copy of the proposed projects with any of the villagers, or even "ElOmda".</p> <p>It was a product oriented development that ended with the end of the project time limit.</p>	<p>After five years, PP of MN is an experience that is worth recording. Though remarkable in itself, it is difficult to trace any ongoing activity, workshops, and projects or process that started in 2005.</p> <p>A lot of projects were executed, and a lot of donations were spent, yet nothing lasting until 2010 except the physical infrastructures (culture palace, health centers, youth centers, water and sewage underlines, etc.)</p> <p>It was a product oriented development, because it ended with the end of the project time limit.</p>
<u>b-Projects execution</u>	
<p>For project names proposed by the P.P. in both case studies and research monitoring and evaluation for each of them. see appendix E,F</p>	
<p>As the projects executed were financed from Shorouk Program and "Emergency plan donations", almost all projects executed were infrastructure ones. No educational, environmental or economic projects were executed.</p> <p>In Beltan, 23% of the projects proposed in PP in mother village and the six satellite ones were executed/achieved until the end of 2010;</p>	<p>Though resources were various, Most donations were given to infrastructure development. Still there were projects executed in all fields of development.</p> <p>In MN 52 % of the projects proposed in PP in the 4 shiakhat were executed/achieved until the end of 2010.</p>

Village Name	No. of Projects/targets executed/achieved out of those planned		Shiakha Name
Beltan	5 out of 14	18 out of 34	El-Masaken
Manshaa Al Ammar	4 out of 14	20 out of 31	Asfal El-Razaz
El-Safaina	4 out of 12	17 out of 36	El-Moadessa
El-Gazaweia	3 out of 20	11 out of 26	ElGamea
Zawyet Beltan	2 out of 15		
El-Abadlla	3 out of 13		
El-Safa	3 out of 15		

Outcome of participation from Information Aspect:

From the informational aspect, there are three factors affecting “Outcome of Participation” that were discussed earlier in chapter two; “Community networking”, “collaborative Information System” and “Knowledge Engineering”. Table 5-20 presents results of testing each of these factors in the case studies.

a- Community networking

There was no community networking in both case studies. Face to face intervention dominated communication means, and illiterates were excluded from the participation.

b- Collaborative Information system

Efficient and dynamic information system requires collaboration between different data bases. These data bases are either statistical (concerning population, illiteracy, health and economic information together with recent maps) and which are available in different governmental departments and ministries, local public councils, the CAPMAS, the NGOs and the private sector, or local (concerning people's problems, aspirations, creative solutions) which is available in local people's brains and minds. Therefore collaboration is essential between these databases.

This factor studies collaboration between Government, NGOs, Organizer, and Private sector and Participants to provide a coherent and updated information system.

c- Knowledge Engineering

Transforming information to knowledge is crucial to the success of PPP, were the recipients are variant in their educational and cultural background. Knowledge Engineering concerns the way participants handle data and if it was useful and comprehensible or not. Presenting to the participants sophisticated information that doesn't match their level of education wouldn't make sense to them, and thus they wouldn't make use of it. This is what happened in both case studies where some of (14.3 % in Beltan and 20% in MN) the participants reported that the information given to them was incomprehensible.

Table 5-20: Testing “Outcome of Participation” factors form Information Aspect in both case studies

Source: Research Questionnaire, 2010.

a- Community networking	
Beltan	MN
PP in Beltan depended on the social community network that was already there. According to the research questionnaire, all participants knew about the PPP from the LPC members or form El- Omda, according to the social links with them. As there was no publicity for the process, there was also no network initiated for serving the PP needs.	There was no community network that served the PP in MN. Existing social network served and face to face interventions were the two dominant communication means. After five years most participants lost links with each other, except those who were working in local NGOs and they still have links with the GTZ.

b- Collaborative Information System	
Beltan	MN
<p>A Collaborative information system was generally missing in Belton's PP;</p> <ul style="list-style-type: none"> • Collaboration was present to some extent between different governmental sectors, from ministries, to governorates, to Marakez and finally to LPC s • Collaboration was missing between the government and the NGOs. • Collaboration was also missing between the government and the private sector. 	<p>A Collaborative information system was generally present in MN;</p> <ul style="list-style-type: none"> • Collaboration was present to a good extent between different governmental sectors, from ministries, to governorates, to Markaz and finally to LPCs. • Collaboration was excessive between the LPC, GTZ and the NGOs. • Collaboration was also present between the GTZ and the private sector.
c-Knowledge engineering	
<p>According to the questionnaire, Participant understood how to take part in the process by:</p>	
Beltan 76%.	MN 50%
<p>This relatively high percentage is due to the simple procedures of the P.P. that participants had to go through. They Simply wrote down their problems in the questionnaire handed to them and discussed the solutions also presented to them through the HBRC.</p>	<p>Although data collection and analysis was done by participants, this relatively low percentage is due to the detailed and technically hard workshops and excessive sessions (some sessions included a GIS course given to the participants).</p>

Outcome of Participation from Social Aspect:

From the social aspect, there are three factors affecting “Time of Participation” that were discussed earlier in chapter two; “Public Acceptance”, “Resources” and “Leadership and Human capabilities”. Table 5-21 presents results of testing each of these factors in the case studies.

a- Public acceptance

This factor is concerned with the acceptance of the whole community, to the final outcome of participation, as well as the participants. This could be known if there was a public hearing by the end of each final stage in the decision making.

This factor will have an effect on the level of participation in any successive PPP taking place in the same community. If public acceptance was high, this would leverage trust levels and transparency in next PP.

b- Resources

Resources of the P.P. is crucial not only for the execution of projects proposed, but also to organize the participation and the expenditure on the workshops, public hearing and meetings, information required, collaboration, monitoring and evaluation.

-The more variant the donors, the better for the sustainability of the process.

-The more internal the donations are, the better for the transparency and efficiency of the P.P., because the donor always has an upper hand in the P.P. and the more self-sufficiency of the process

c- Leadership and human capabilities

One of the most precious outcomes of PPP is the leaders and human capabilities that it built in the community. This factor affects the sustainability and independency of the process when the organizer is gone.

Table 5-21: Testing “Outcome of Participation” factors form Social Aspect in both case studies.

Source: Research Questionnaire, 2010.

<u>a-Public acceptance</u>		
Participants consider the P.P.P. that took place in their area	Beltan	MN
		According to the research questionnaire,
-A success	30%	21%
-A good trial	70 %	79%
-A failure	0%	0%
However, as public acceptance is highly dependent not only on the participants acceptance, but on the majority of the villagers and dwellers acceptance, there were no public hearings, or public voting on the final decisions of PP like the new premises of the villages, neither on the new maps, nor on the proposed projects. Therefore there is no evidence that the public were satisfied with the outcomes of PP.	There was a public announcement in each sheiakha through a public meeting. In these meeting the public were informed about the outcomes of PP and the list of projects intended for each shiakha. Yet there was no public voting on the final decisions and on selected projects. However, the GTZ had undergone a "citizen satisfaction survey" ¹² after PP which covered services presented by the LPC.	
<u>b-Resources of the P.P.</u>		
Beltan	MN	
Governmental resources were not directed towards the accomplishment of projects proposed, or the development suggested in each village. Its budget was rather directed towards the universities, HBNRC	-100 million L.E. from the GTZ (90% infra structure, 10% community investment fund small community project). -(unknown figure) from the Egyptian Government (Employees, lands, taxes, facilitation)	

¹² A questionnaire that was distributed among (from 15-25) citizens from each sheiakha, and 2 interview for each service studied, then argument meetings for all those questioned and the work team and the GTZ team

<p>and the offices that performed the GIS maps. Financing the projects of PP depended on: -"Shorouk Program"¹³, -"Emergency Planning Program for Basic Utilities". As a result, small percentage of the projects proposed were accomplished while very little basic utilities were served through "EPPBU". There were no donations or resources from within Beltan, and thus resources are un renewable.</p>	<p>- 90 000 dollars from the Japanese Embassy. (grass root fund, for education, health, vocational training) - 50 000 Euros from the RWE (German Petroleum company) for education - 880 000 L.E from the electricity company *Total resources=101 730 000 One hundred and one million and seven hundred and thirty thousand pounds plus governmental recourses There were no donations or resources from within MN, and thus resources are un renewable.</p>
<p><u>c-Leadership and human capabilities</u></p>	
<p>Beltan</p>	<p>MN</p>
<p>As was mentioned before, no workshops took place (before or through PP phases). Therefore, PP in Beltan didn't explore new leaders, and didn't leverage the human capabilities of those who already existed or the local villagers in general.</p>	<p>Several natural leaders in MN gained a lot of experience from the workshops held and the field visits that they undergone. Even the local public council members gained a lot of experience. They attended training, planning, and GIS courses.</p>

¹³ "Shorouk Program" is a rural development program that started in rural Egypt in 1994. It is directed towards general upgrading of all aspects of life in local society depending on a democratic and participatory framework. Abo Elfetouh, 2006

5.3 SUMMARY OF FINDINGS

-“Level of participation” ; MN was more successful than Beltan in achieving higher levels of participation according to percent of participants and community representation, yet, the almost 1 percent participation is still a very low percentage.

-“Time of Participation”; Beltan was more successful than MN in distributing the tasks among participants and having participants focused in little number of problems and more number of PP phases. Easy PP in Beltan turned “time of participation” six times less than that of MN.

-“Outcome of Participation”; Both case studies were of the “project” type and not the “process” type. Outcomes of both case studies were time limited projects. MN was more successful in achieving a higher number of projects than Belten.

Table 5-22 sums up the research findings of the test of success criteria in both case studies.

Table 5-22: Summary of success criteria in case studies.

Source: researcher.

	Beltan	MN	Comment
Level of Participation	0,002	0.009	MN more than four times than Beltan.
Woman representation	31	40	Contrasting to Beltan, in MN Women and youth representation was mentioned in TOR and fulfilled in application
Youth representation	0	30	
Dependency			
On donor	68	70	Little donations coming from within the case studies, but in MN, after a Land titling Committee had been established, internal financial supply is provided through People's ownership claims.
On organizer	69	53	In Beltan, the organizer did the data collection, analysis and

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				presented them to the participant, but in MN, participant did the whole thing with the help of the organizer.
Ease of Practice	56 % non-easy	62 % non-easy		In Beltan, lack of any manuals or workshops. Tough practice and intensive workshops in MN.
Awareness of P.P. of existence	32	53		High awareness because of considerable advertisement and public meetings in MN
Means to raise awareness	Mosque and flyers	Flyers and Participatory Education		Culture and social Difference bet. Rural and urban means of advertisement means
Quality of Information				Difference between information: presented in Beltan and processed in MN
Sufficient	86.5	63		
Trust worth	84.7	63		
Comprehensible	84.7	80		
Preferred computer Interface	Voice recording	Images then voice recording		Difference bet. Trained and untrained participant.
Common Motivation	Legalizing ownership			Same motivation satisfying the second step in Maslow's pyramid. (see Motivation chapter 2,P.62)
Social Cohesion	100	88		High S.C. in rural setting, average in MN.
Transparency and trust	69	24		Low records in MN because of untrusted info. Presented to participats.
Social Exclusion				
Illiteracy	26	27		More than one quarter of community excluded from participation in both case studies.
Un-employment	12	33		Positive impact of unemployment on level of participation
Most influential factors to raise level of participation				Transparency and Trust

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	Beltan	MN	Comment
Time of Participation	=5 min/part./day	=30 min/part./day	Time of participation in MN is 6 times longer than that of Beltan
Tasks per participant			
Number of Planning phases	4 and 5	1, 2	Better commitment to full process in Beltan than in MN.
Number of problems	1, 2,	1 and 2	Equal small no. of problems in both case studies.
Actual Learning means	None	Work-shops	
Preferable Learning means	Work-shops	On site by doing	
Acquiring and updating data	Trusted sources, old info.	Trusted sources, updated info.	Organizer intension is to develop MN, while organizer in HBRC is to raise personal profits as much as possible.
Problem solution data bank	None	None	
IT learning tools	None	GIS	
Preferable communication means	Face to face and public meetings		Because of difficulty of practice
Commitment	Max. commitment	Med. Commitment	Highly related to difference in time of participation in both case studies trust
Technophobia	2.5	16	
Argument documentation	None	Existed recording	Useless Recordings because it is not published in MN
	Beltan	MN	Comment
Outcome of Participation	Product type	Product type	PP targeting short term outcomes, low level of participation
Community networking	None	None	
Collaborative information system	None	None	
Knowledge	76	50	Easiness and strong

Engineering			interference from organizer in Beltan lead to higher rates than MN.
Public acceptance	30	21	Considerable public acceptance in both case studies.
Resources	External Unknown	External Minimum of 101 730 000 L.E	Variant external resources in MN, and governmental resources in Beltan
Leadership and human Capabilities	None	Leveraged	Would Help in the local independence of future community development and P.P. in MN.
Sustainability	Both Un-sustainable		
Projects Executed/achieved to those planned	23	52	MN executed /achieved more than twice projects in Beltan

5.4 BRIEF OF MODEL REQUIREMENTS

The test of the success criteria on Egyptian case studies, both urban and rural brings an end to the OO analysis of the required PPP model. Such an analysis entails the definition of PPP principles, steps, and the governing rules for success application through a success criteria factors.

Table 5-23 sums up the PPP model requirements that should be included in the OO design of the PPP model.

Table 5-23: PPP Model requirements.

Source: Researcher.

Maximize Level of participation	Rural	Urban
Transparency and Trust	<ul style="list-style-type: none"> - Argument documentation - open budget policy - public voting on final decisions - community PPP leaders chosen by election 	
Equal representation of community in P.P.	<ul style="list-style-type: none"> - broadening participation of women, youth and disabled to equalize their percentage in the community 	
Gradual decrease of dependency on organizer. (PPP weaning from	<ul style="list-style-type: none"> -Training LPC employees, members and natural leaders from within the community to administrate the process on their own with regular supervision from the original organizer. 	

organizer).		
Decrease dependency on donor	-Finding new internal donation supplies. -Maximize spectrum of donors.	
Providing an easy way for community members to practice PP.	- Making sure PPP is explained to community members with variable formats that suit their variable nature, i.e. Providing a tailor made P.P. guide for illiterates, medium and high educated people. -Simplifying tasks required from each participant i.e. small task done in short time. (Related to tasks per participants in time of participation) to insure continuity and increase commitment. - Linking small work done by each participant to form one coherent whole.	
Increase awareness of existence and importance of PP	Various means of advertisement	
	First Through Mosques and churches, then Flyers and Participation Education in schools(for both short and long term)	First Through Flyers, then participation education in schools and in Mosques and Churches
Promote Computer Interface	Through voice recording (input-output)	Through images (output) and voice (input-output)
Enhance Motivation	Follow Maslow's pyramid to enhance motivation through fulfilling most needed requirements at the pyramid's base, then moving up.(self-referentiality)	
Regenerate workgroups	-Self-replication of Working groups. Workgroups should have the ability to replicate themselves in other places in the same local area, if commuters are suffering the same problem.	
	Minimal effort needed because of Homogenous society and strong social cohesion.	Excess effort to resolve tribal like setting stone-communities (refer to chapter 2), through finding common grounds and excessive efforts from community leaders and/or organizer.
	-Providing a tailor made program through PPP to fight social exclusion, by working collaboratively with NGOs, Governmental authorities and participants. -providing a secured/permanent financial income	

	for expenditure on execution and advertisement for social exclusion programs.(constant vocational training courses and illiteracy eradication classes and employment offices)	
Minimize Time of Participation	Rural	Urban
	5-10 min/participant/day To ensure commitment, sustainability, and convenience.	
Tasks per participant	Providing participation by minimal effort from participant by considering each phase and problem an independent participatory action even voting on final decisions.	
Acquiring and updating data.(quality of information)	<ul style="list-style-type: none"> - Depending mainly on local information (information collected by community members). -Insuring information provided about issues concerning PP are -<u>Sufficient</u>: covering all aspects of the issue at hand. -<u>Trust worthy</u>: being local would build trust, and if provided from external sources, then enough evidence of correctness should be provided (like pictures, live videos, etc) -<u>Comprehensible</u>: avoid presenting charts, graphs, GIS techniques to the mob in public meeting and in flyers) -<u>updated</u>: regular information updates through collaborative information system. *Public evaluation for the 4 previous measures of the quality of information would enhance it. 	
Provide preferable Learning means	-Promote asynchronous and indirect means of distance learning through(flyer guides, T.V., Radio, mail, Computers, Mobile messages) in both rural and Urban settings, in addition to;	
	-Excessive face to face interventions and public meetings with commuters through constant/permanent times and places.(culture palace, public library, youth center, LPC hole, for example every Friday)	-provide permanent indoor and onsite workshops for (PRA and Planning sessions) for LPC and NGO members
Problem solution data bank	-Provide with the help of professionals a data bank for common problems, and solutions (even from outside the community) and best	

	practices.(related to ease of practice)	
Increase Commitment	-Offer small tasks with little and convenient time and place of participation,	
Fight Technophobia	-provide participation through interactive screens in public places (cafes, mosques and churches, youth centers, clubs, etc.) with easy preferable interface.(related to computer interface) -develop computer literacy in schools and through NGOs	
	-Through written, and recorded audio and video means. (Related to Transparency)	
Outcome of Participation PP transformed into PPP	Rural	Urban
Community networking	-Creation of a multi-modal network that links Governmental authorizes with NGOs and community members which facilitates communication and information update and exchange.	
Community Self-organization	Automated distribution of community members into participation focus groups according to interest and capabilities. -Internal formation of workflow according to facilitators and participants capabilities and preference.(bounded rationality)	
Public acceptance	-Insure public voting on problems/solutions prioritization, final plans and decisions and budget distribution.	
Resources	-Promote internal resources -Variable sources -Permanent/sustainable	
Collaborative information network	-create an information network that depends on all the parties involved in the process, where <ul style="list-style-type: none"> • Local commuters provide information about local problems, • Local public council provide governmental information about these problems , and • Consultants provide the professional information about them. 	
Leadership and human capabilities	-Training directed to the community members in general. (teachers training, vocational training, etc) -Training directed to LPC employees and	

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	members and NGOs members
Self-correction mechanism	-Continuous monitoring and evaluation of community plans and projects
Sustainability	-Cyclic loop of PPP (meaning after monitoring and evaluation, to self-correction and start over again)

Guided by Object Orientation Analysis (OOA) of PPP principles and steps, complexity solutions and PPP success criteria analysis, this chapter presents the Object Orientation Design (OOD) of the PPP model.

Design of PPP model identifies main agents, their functions and PPP steps. This will serve as general guidelines aiming at successful implementation of PPP in both rural and urban settings.

In Chapter 4, justifications of selecting MAM have been outlined.

To set the model specifications, PPP follows the analytical nature of MAM to contain complexity, in terms of decompositions into main agents and functions.

Graphical facilities of UML, briefly described in chapter four, has been utilized to illustrate these specifications.

The current chapter is sub-divided into eight sections;

6.1 presents the Packages of the PPP model

6.2 presents the Governing Rules of the PPP model.

6.3 presents the Agents' Functions of the PPP model.

6.4 presents the states and inter-relations of the PPP agents.

6.5 presents major activities of the PPP model.

6.6 presents the collaboration among agents and the sequence of their activities.

6.7 presents the components of the PPP model and its deployment.

6.8 presents the way multidisciplinary PPP is integrated by the model.

6.1 Packages of the PPP model

The PPP model demonstrates the way all parties involved in the process collaborate their efforts to perform PPP steps, abiding to PPP principles and satisfying PPP success criteria.

Involved parties of PPP are decomposed in terms of packages. Each package is further decomposed into a set of agents, as mentioned in chapter 4. Agents are categorized as active or passive. Most of the functions of the PPP model demonstrate the way active agents work collaboratively to generate the passive ones.

Parties involved in PPP are categorized under seven packages, each package contains classes that have similar functions, or common attributes. Starting with the package diagram of the PPP model- as the most general UML diagram-, fig 6-1 presents overall structure of the PPP model. These seven packages are;

- “Initiator”,
- Local Public Council “LPC”,
- Non-Governmental Organizations “NGOs”,
- “Community”,
- Participatory Planning Committee “PPC”,
- “Interfaces” and
- “Central Data Bank”.

Among these packages, PPC is the only one which needs further elaboration. It is a proposed local committee to steer the whole process in a certain community with defined geographical borders, that has one LPC and a number of NGOs. As shown in fig. 6.1, the arrows between packages indicate the dependencies among these packages. “PPC” performs PPP supported by “Central data base” and interacts with the “LPC”, “NGOs”, and the “Community” through the entitled “PPC Interfaces” package.

As shown below, package diagram includes an interfacing hubs which links the PPC package with other packages. Further details are given in section 6.1.5.

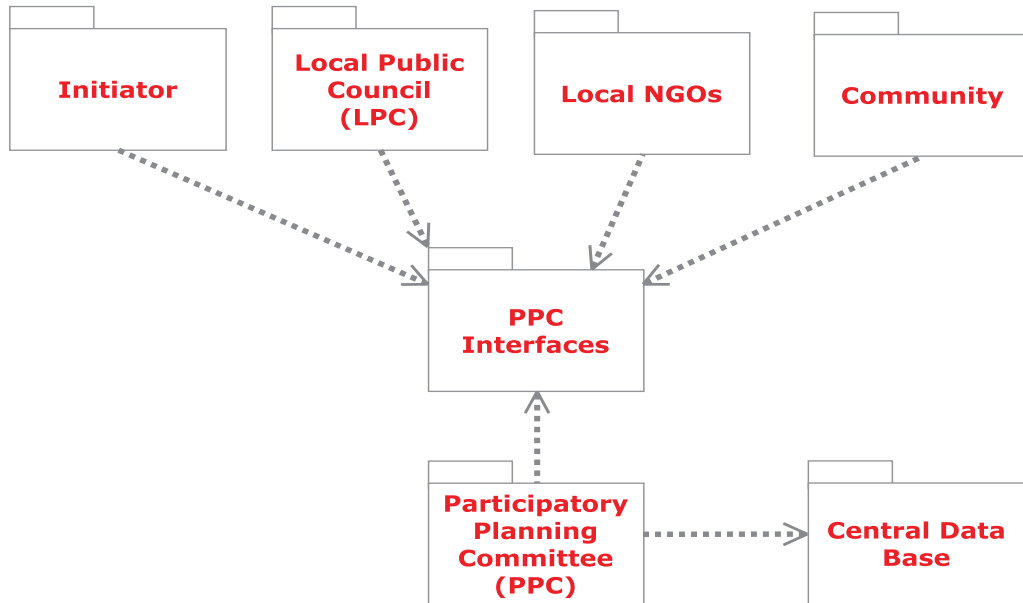


fig.6-1: Package diagram of the PPP model
source: resercher construction

The following sub-sections (6.1.1 through 6.1.6) define all packages and their compositions except “LPC” and “NGOs” whose representatives definisions are stated within “PPC” itself. This is to avoid irrlevant details of internal compostions of external organizations.

Each of the seven packages is further analyszed in hierachies of super classes and sub-classes.

For example, the superclass “PPC” is analyzed into a set of sub-classes including representatives, consultants, resource collectors and workgroups. The workgroup itself is a superclass, which in turn comprises facilitators and participants as its sub-classes.

Such hierarchies will be given in the composition diagrams of the model's packages.

In Composition diagrams, classes are interlinked via associations. To indicate number of instances of one class in relation to another, different symbols of Multiplicity notations are used, usually located at both ends of associations.

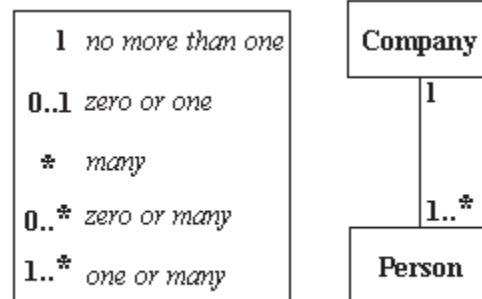


fig.6-2: multiplicity notations
source: smart draw tutorials

For example, fig. 6-2 shows that in one company, there could be one or many persons employed.

6.1.1 INITIATOR PACKAGE

The initiator is the organization which has interest in PPP and is willing to invest money and effort in developing communities using this paradigm. Based on previous case studies, the initiator is recommended to be a nonprofit, non-governmental, either national or international organization. Such initiator's identity enhance integrity, trust and transparency of the process.

To guarantee sustainability, a major outcome of PPP (see chapter two), some sort of presence of the initiator in the local area should be permanent. This could be done through recruiting representative/s in PPC.

6.1.2 PARTICIPATORY PLANNING COMMITTEE (PPC) PACKAGE

As mentioned above, PPC is the local committee steering PPP in a local area. PPC is of a dual entity, a physical entity and a digital entity. The physical entity of the PPC has a permanent office in the local area, while the digital one has a computer facility and a link to the internet.

PPC comprises many agents. As shown in fig. 6-3, it comprises initiator's representative (s), local trained facilitators, LPC representatives, local NGO (s) representative(s), workgroups, consultants and resource collector/s.

a- Initiator Representatives : They serve as the interface between the initiator and the PPC. Their presence should be of a permanent nature to manifest continuous support and supervision of PPC. This in turn insures that PPC doesn't deviate from original principles of PPP. Initiator representative/s also serve as mediators between to reconcile conflicts which may arise among the agents of PPP.

b- LPC representatives: They serve as the interface between PPC and LPC. Their presence within PPC strengthens the committee in two ways. First they provide some sort of legitimacy to the committee. Second, they provide governmental support by supplying PPC with governmental information, and administering and supervising planning and growth of the area. Needless to say that such support requires training as well as acquisition of required equipment. The LPC representatives play their part in the model to serve the needs of both PPC and LPC. PPC needs are represented in satisfying public demands, while LPC needs are represented in satisfying the share of the local area within the regional plans.

c- NGOs representatives: they serve as the interface between the PPC and their NGOs. All local NGOs should be invited to take part in PPP, hence they should have representatives in PPC. Each NGO should have at least one representative in PPC. The NGO representatives play their part in the model to serve PPC needs in coordination with basic their NGO responsibilities.

d- Consultants: A consultant is an expert in a specific discipline or field, be it social, planning, economic, environmental, informational etc. As a hired PPC member, consultants are responsible for providing professional support to PPC upon request. the consultant has the catalyst role, by being a source for a second opinion.

e- Resource collector(s): The resource collector collects donations to cover the expenditures of PPC. Such expenditures include employees' salaries, consultancy and workgroup expenses, awareness campaigns, communication agency and the projects and costs of solution implementation.

At the beginning, these expenditures are covered by the initiator. Hopefully After establishment of PPC, it will assume a level of self-sufficiency to cover these expenditures by the resource collector.

f- Workgroup: is formed to solve a single problem. Participants in the same workgroup work on solving a problem which they all “share/complain/suffer”. This is the main motivation to their participation and the main reason behind the commitment sought from them. It comprises a number of participants led by at least one facilitator, LPC and NGO representatives and a consultant (if requested).

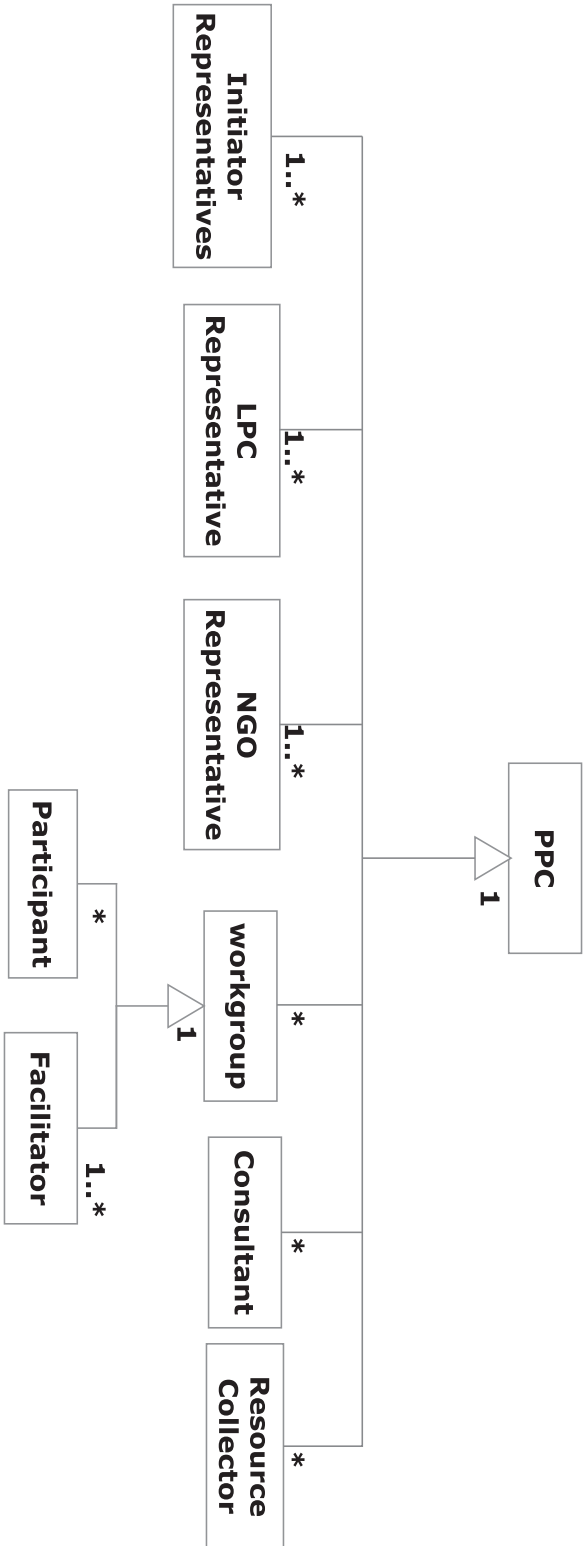
-Facilitators: The World Bank definition of “facilitator” is *“a person who is acceptable to all members of the group, substantially neutral, and has no decision-making authority, who intervenes to help a group improve the way it identifies and solves problems and makes decisions, in order to increase the group’s effectiveness.”* In addition to the previous definition, the facilitator should have two extra traits :

-the First trait: he has to be a community member who is elected by commuters to represent them in PPC and in workgroups. This improves his/her acceptability and enhances transparency and trust.

-the second trait: he/she has to be an employee in PPC rather than a volunteer. This improves commitment, and insures sustainability of the process.

The facilitator represents the community in PPC and at the same time, represents PPC in workgroups.

-Participant: A participant is a member of a workgroup. The same participant could be a member in more than one workgroup, according to his/her interests.



1 one
 1..* one or more
 * more than one

fig. 6-3: PPC composition diagram
 source: Researcher construction

6.1.3 COMMUNITY PACKAGE

Community package has the following agents.

-“Target citizens” represent the population within the community subject to the problem in hand.

-“Active citizen” : any citizen who approach PPC with any complain or problem. He/she is a candidat to be a “Participant” if accepted to join a “workgroup”.

6.1.4 CENTRAL DATA BASE PACKAGE

The central data base stores three main data types.

First type; Data agreed upon by PPC: this includes,

-“**Data Entry Protocol**” : The data entry protocol defines the rules that PPC should settle on to ensure sufficiency, comprehensibility, transparency and trust in data collected from participants to form “Problems” and “Solutions” profiles.

-“**Workgroup Protocol**” : The protocol of the workgroup defines rules governing the performance of workgroup and its inter-relations with other agents in the model.

Second type; Data required about agents of the model agents: this includes,

-“**PPC Profile**” : is a data set storing all data about previously specified agents of PPC package i.e representatives of initiator, LPC , local NGOs, local facilitators, participants and workgroups.

- “**Active citizen Records**” : is a data set storing data about the citizen who reported a problem or a complain to PPC. The record contains the following fields: name, problem, contacts.

-“**Resources and expenditures**” : is a data set storing data about aquired resources along with PPC expenditures.

-“**Workgroup record(s)**” : is a data set storing data about workgroups compositions, states their representation percentage, their membres and facilitators, their traget citizens number and gender, their and acheivments.

-“**Participant record(s)**”: is a data set storing data about participants including their educational and cultural backgrounds, data about each participant including address, education and social status, preferable communication channels concerning input and output of data and cooperation of the participant and the workgroup as a physical and digital entity and the other participants also physically and the digitally.

-“**Local NGOs profiles(s)**”: is a data set storing data about the different NGOs in the local area, their locations, members, areas of interests and activities and facilities they offer. It also includes data about their efforts with the workgroups and their representatives.

Third data type: Data produced by agents: this includes

-**Community Profile (CP)**: a profile describing current status of the social and economic environments of the community. The profile is constructed by experts in social and economic sciences. It features those factors previously mentioned in chapter two affecting PP success criteria.

-**Local Area Profile LAP** : a profile describing the current status of the local area environments; both built and natural. The profile is constructed by experts in urban planning and design. It features data about natural environment including air, water and soil, and built environment including infrastructure, services, facilities, buildings and roads.

-**Fundamental Programs** : are the programs that tackle emergency issues imposing threats on the community, whether social, economic, natural or built environments. It has a set of measures. Each of them is invoked when any profile feature exceeds a pre-specified threshold. For example if water pollution exceeds a pre-

specified threshold of the bearing capacity, a fundamental program is invoked.

-Problem(s) Profile(s): is a passive agent generated by the workgroup active agent. Problems could be social, environmental, economic or urban. The profile consists of problem related data along with their analysis. This represents a draft profile to be approved finally by the workgroup.

-Solution(s) Profile(s) is a passive agent generated by the workgroup active agent. It contains all data about “solution” chosen by the workgroup participants. This includes solution specifications, procedural data in terms of steps or components (could be a complex solution formed of many steps or contents), implementation phases, time schedule , etc.

-Project(s) Profile(s) Project profile is a solution profile for a single project in case the solution profile involves more than one project.

-Problem –Solution Data Bank is a practical mean to define the solution space. It is populated by solutions drawn drawn from best practices implementaed world-wide. A wikipedia format is recommended to emphasis the participatory natuer of updating such space dynamically.

Creation of this space will be done through web mining. Solution will picked up by the participants of the workgroup, to fit a chosen solution to the problem in hand, customization may be required by an expert. Web minimg could be based on the following search parameters; target group (gender and number), location (rural, urban or slum, etc.), (like resources available, social and political environemtns, etc).

The composition of the “Central Data Base” is shown in fig 6-4 .Notice the use of multiplicity notations in the association linking Community profiles with its agents.

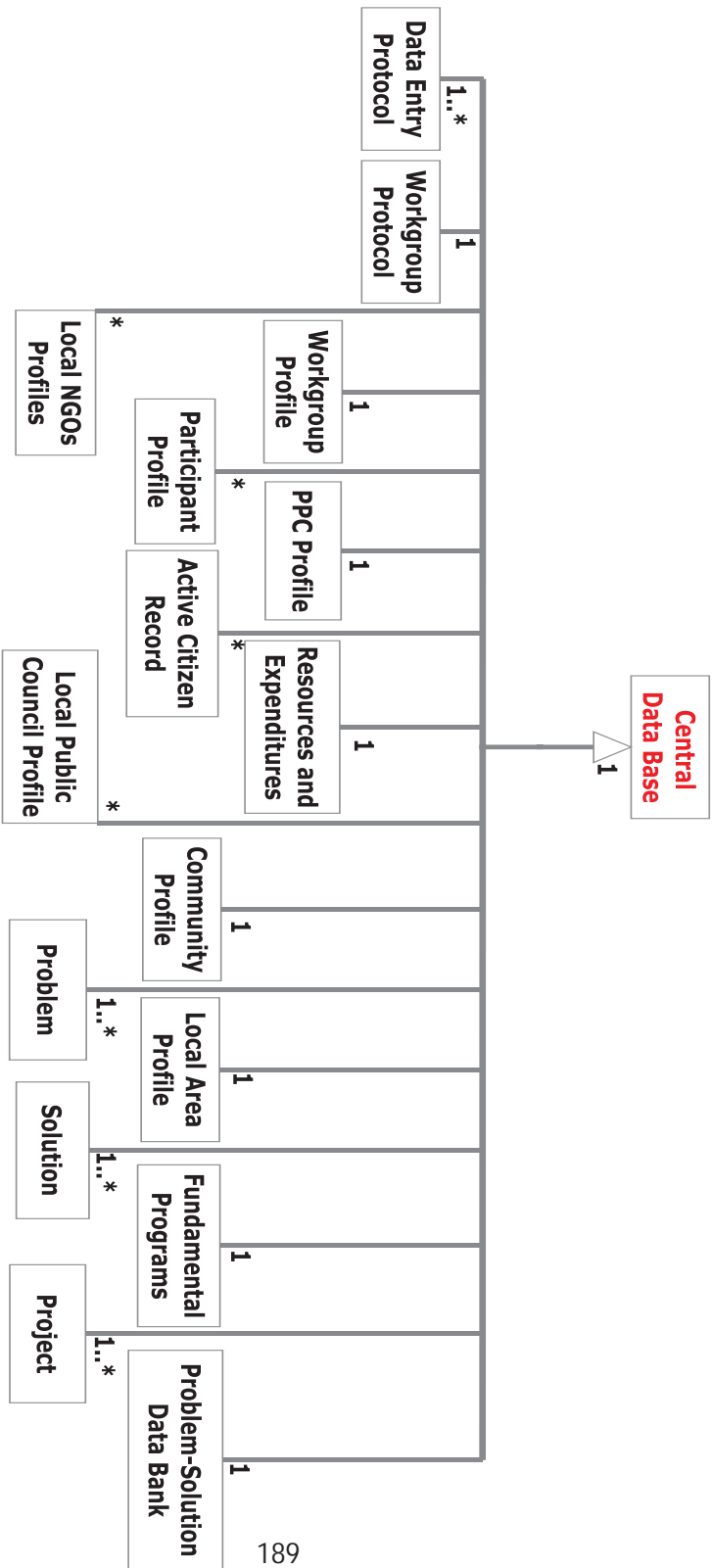


fig. 6-4: Central Data Base composition diagram
 source: Researcher construction

6.1.5 INTERFACE PACKAGE

This package contains the agents that serve as the link between the PPC package and other model packages. It consists of the following agents:

-LPC representatives: serve as interfaces between LPC and PPC.

-NGOs representatives: serve as interfaces between LPC and PPC

Initiators representatives: serve as interfaces between initiator and PPC

-Communication Center: is a facility with a physical existence through a permanent location and informational sub-part in terms of a server linked to the internet. It provides various modes of communication among agents of the PPP model. The center is based on dynamic social Network analysis DNA. DNA architecture consists of three components changing with time. These are; nodes messages and channels. Mapped to PPP architecture, DNA components correspond to agents, functions and communication channels respectively. All functions of the PPP model are specified in details according to the tripled abstract of DNA in section 6.8.

-Advertising Agency: is hired by PPC to perform any desired awareness campaigns concerning PPC's general publicity or any publicity needed for a specific project or workgroup.

Two remarks are worth mentioning here;

First: LPC and NGOs representatives are PPC members at the same time as described previously 6.1.2.

Second: Interfacing agents are basically human representatives. community interface however may be of human representatives as well as digital agents like communication center and advertising agency.

6.2 PROTOCOLS OF PPP MODEL

The governing rules of PPP model has two sources. First source emerges from model's requirements and specifications previously identified in chapter 3, 4 and 5. Second source of rules is flexibly formulated by PPC according to every case peculiarity of the local area .These governing rules are identified in the PPP model as "Protocols".

These Protocols stipulate the behavior of agents and their inter-relation as well. Such inter-relations as well as agents dependencies are expressed by UML language in terms of Associations and Constrains diagram. To help the reader go through Association and constrains diagrams, a brief description of used notations is given below. Appendix C contains full details of UML notations.

Association is a static vector with a direction.
It represents inter-relations between classes.
Association names are placed above, on, or below the association line. A filled arrow indicates the direction of the relationship.
Roles of agents are placed near the end of an association. Roles represent the way the two classes see each other.

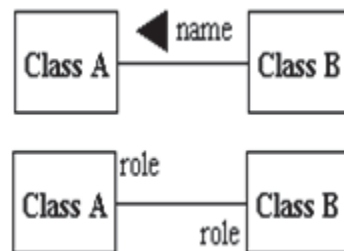


fig.6-5: association diagram
source: smart draw tutorials

Composition is illustrated with a filled diamond. a hollow diamond represents a simple aggregation relationship, in which the "whole" class plays a more important role than the "part" class, but the two classes are not dependent on each other. The diamond end in both a composition and aggregation relationship points toward the "whole" class or the aggregate. See fig. 6-5. This relation could be homogenous, like the appartment and its rooms, or heterogenous, like the road and the trasportaion network.

6.2.1 PPC PROTOCOL

Sustainability is a major model concern of the PPP model. Its achievement requires the sustainability of the PPC. Several conditions help meet such requirements;

-PPC should have a permanent location in the area.

-PPC members are paid employees from inside the local area, except for the initiator's representatives who could be outsiders.

-PPC should be permanently supervised by initial donor (e.g. UN, or GTZ.)

The **associations** diagram is an effective means to emphasize the explanatory nature of the model. Since it highlights inter-relations (associationa) between different agents of the model. Fig. 6-6 depicts PPC association diagram between PPC and other model agents. Each association emphasises one of the model requirments from chapter five.

-“PPC” is initiated by the “initiator” to form a local sustainable development committee.

-“PPC” is the motivator for the “Active citizen” to report his/her problem.

-all representatives and members are employees in the PPC which is the steering committee to all of them.

-“PPC” is merely a supervisor, and resource provider for the “Problem” and “Solution” and “Project” agents, while the three are data bases for the “PPC”.

- association between the “PPC” and “advertising agency” is the advertizment for PPC's fumdemantal programs, distribute PPP manuel guides among participants and advertize for required donations , which makes “PPC” a client to “advertising agency”.

- association between the “PPC” and the “consultants” is the creation of the “LAP and CP”, which makes “PPC” a client to “consultants”.

-“facilitators” are recruited in the “PPC” through public elections as they serve as the commuters representatives.

-“PPC” is the initiator of “workgroups”, while “workgroups” are the “Problem” and “Solution” providers to “PPC”.

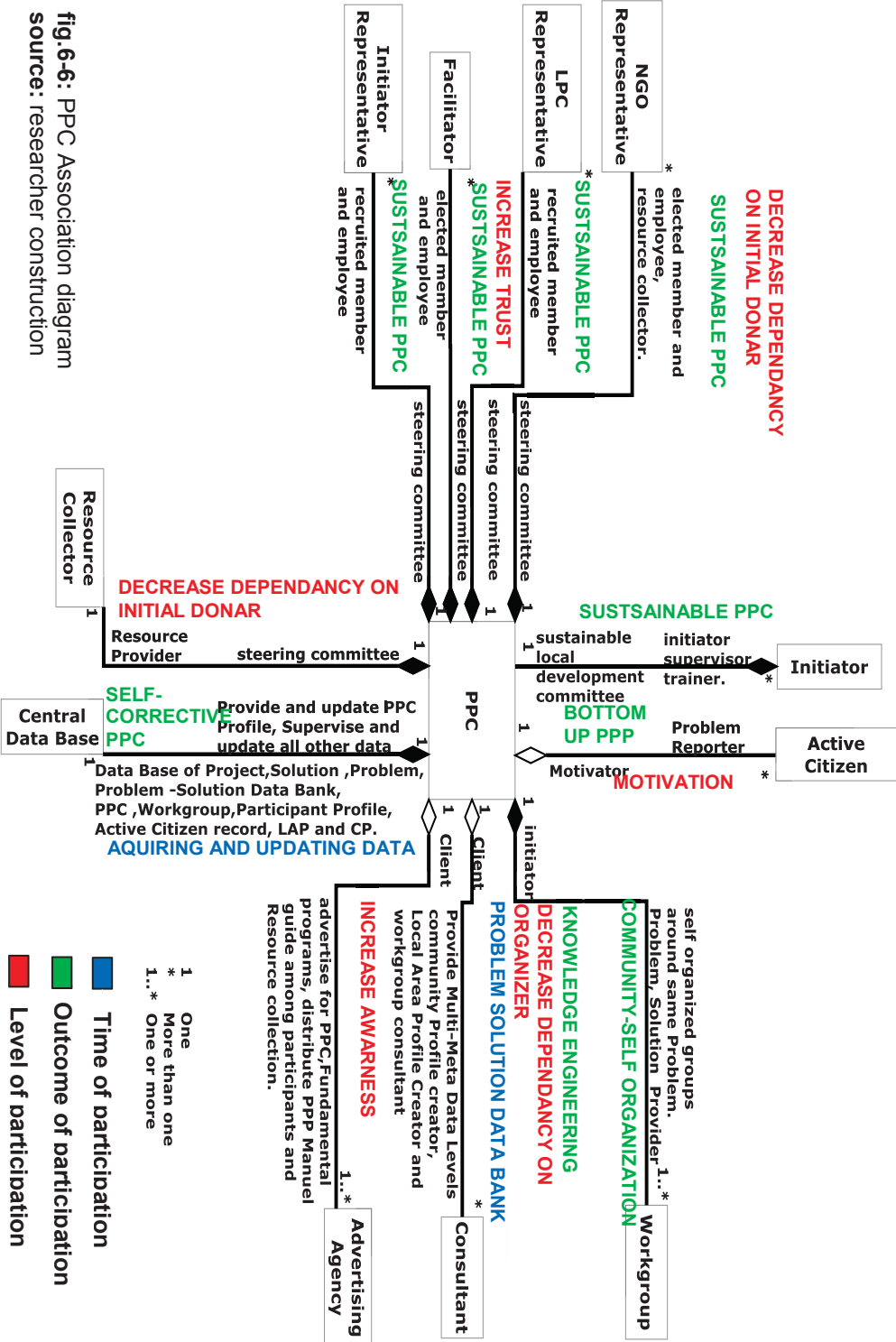


fig.6-6: PPC Association diagram
source: researcher construction

6.2.2 WORKGROUP PROTOCOL

To seed community self organization, mentioned earlier in chapter three, “Self-referentiality” principle is adopted as the basic principle governing the formation of workgroups. According to this principle, participants in the same workgroup are focused on a single problem which they all share and suffer. Such principle would guarantee participants motivation according to Maslow’s pyramid of human needs (refer to chapter 2) as well as their commitment.

The workgroup has many **associations** with all other agents of the model fig.6-7 illustrates associations, their types and multiplicity among agents. Roles of agents are listed below. Each association emphasises one of the model requirements from chapter five.

-The “facilitator” is the director or the conductor of the “workgroup”, but he/she has no voice in the voting process (because he/she is a paid employee).

-The “participant” is the basic constituent of the “workgroup” which affirms the bottom up construction of the proposed model of PPP.

-The “LPC representative” is the legitimacy provider and also the resource provider/contributor whenever possible.

-The “NGO representative” is the internal resource collector, provides a place for workgroup meeting and executes or help in execution of the workgroup projects whenever possible.

-Local “Community” is the local knowledge provider for the participants of the workgroup through questionnaire distributed among target citizens, and the provider of public acceptance through public hearing.

-The workgroup is a client for both the consultant and the advertising agency. While the first provides services of consultancy, the other helps the workgroup to advertise for its activities in order to motivate commuters to join in and increase representation level or to advertise for resource collection.

- The “workgroup” is the creator of the “Problem” and “Solution” profiles.

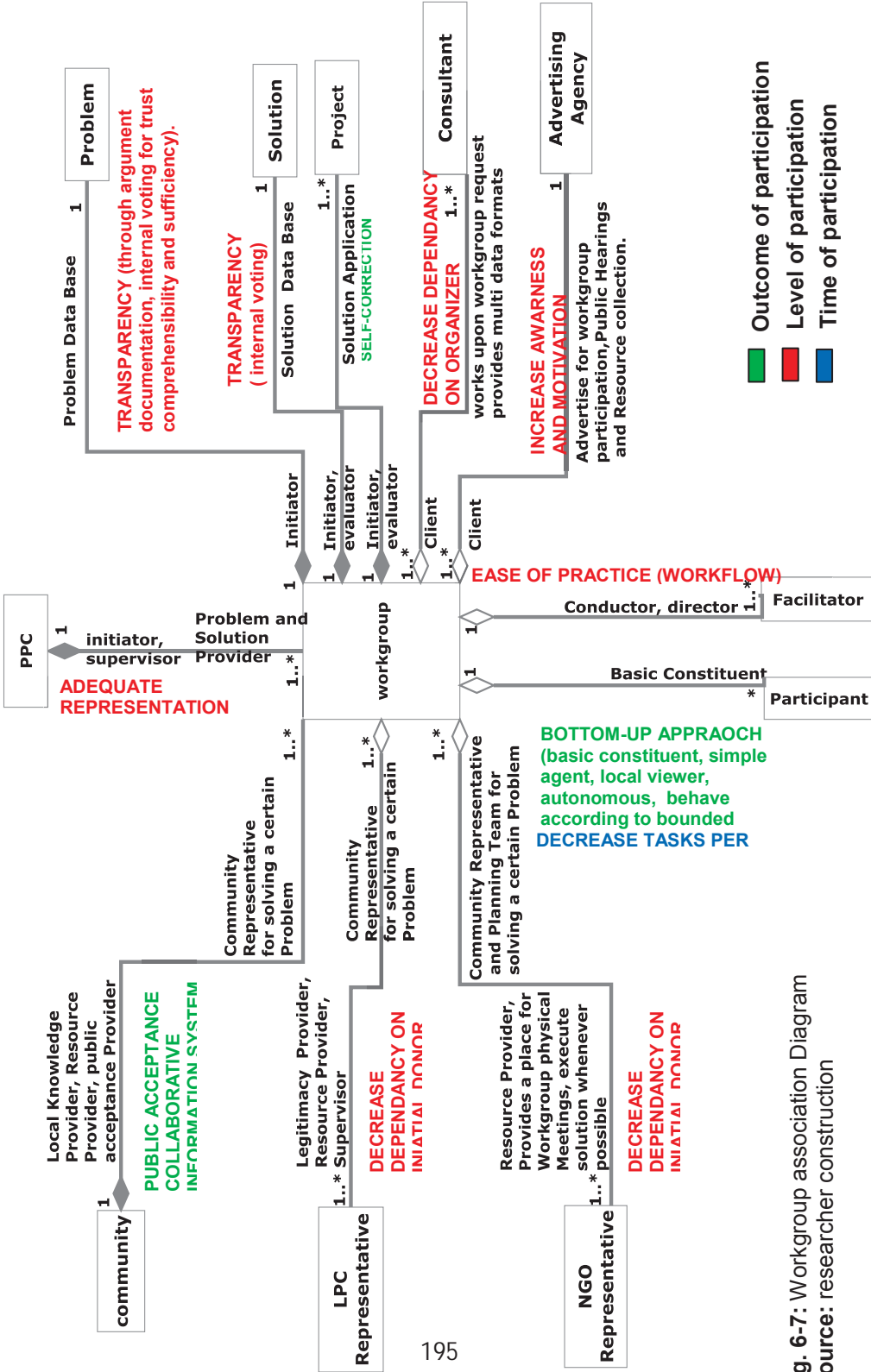


fig. 6-7: Workgroup association Diagram
source: researcher construction

The **conditions** governing the interaction of the “**Workgroup**” with the other agents are illustrated in fig. 6-8 and listed in table 6-1 as follows;

Table 6-1: Conditions governing workgroup inter-relations with other agents

Source: researcher

Relation of workgroup with:	Conditions	Further conditions specifications
PPC	PPC sets -via voting- conditions for appropriate representation of the target citizens by the workgroup. These include percentage of participation, gender and age. For example, if the problem is unemployment, then the participants of the workgroup has to have an x percentage of representing unemployed citizens respecting the gender and age percentages as well, were:	If percentage of representation is less than the one desired, turn workgroup to the inactive state and increase awareness among target citizens through an advertising campaign.
Facilitator	Number of facilitators assigned for the “Workgroup” depends on size of the workgroup, level of literacy and the means of connectivity among target citizens.	1 facilitator for X+Y+Z+R were: X= max no. of wired participants Y= max. no. of literate participants Z= max. no. of unwired participants R= max. no. of illiterate participants Values of “X”, Y, Z and R are decided by practice and subject to modifications and change according to the PPC.
Participant	Doesn’t work except in the “Workgroup” that handles the problem provided by him/her to the PPC. -Has to commit to voting obligatory tasks (discussed later in details in section 6.3.10), besides commitment to any other task chosen form the proposed workflow by the facilitator. (Workflow diagram is discussed latter in facilitator’s functions section 6.3.9). Such a division of work among participants would help increase commitment, focus the scope of work demanded form each participant and minimize time to reach solutions. -in case participants' number or gender is not representing the	

	<p>problem, , the workgroup has to increase awareness through an advertising campaign.</p> <p>-Participants collectively should fulfill all the tasks in the functional list or workflow diagram formed by its facilitator.</p>
Problem	<p>- Each "Workgroup" has only one "Problem" to form, analyze and solve.</p> <p>-A workgroup should not progress from data collection to data analysis unless the minimum number and gender of its participants are representing the problem at hand.</p> <p>-Participants' acceptance is required to finalize the "problem profile". Such acceptance ensures comprehensibility, sufficiency and trust of such a profile.</p>
Solution	<p>Can't reach a final state except after "Participants" voting, to increase internal acceptance of solutions.</p>
Project	<p>Can't reach application except after Public Hearing, to increase public acceptance.</p>
Community	<p>Cannot apply solution without public acceptance through a public hearing.</p>
LPC Representatives	<p>A workgroup can't work without LPC legitimacy, while its representatives don't have the right to vote, to increase transparency</p>
NGO representatives	<p>the NGO chosen to help the workgroup has to have a direct relation to the "Problem" the workgroup is solving. For example, if the "Problem" is environmental, then the NGO has to be involved in environmental activities. The NGO representative doesn't have the right to vote.</p>
Consultants	<p>works upon a request by the "Workgroup". He/she doesn't have the right to vote. Reducing dependency on consultants is a major concern to hand the stick to participants in reference to PP principles.</p>
Advertising Agency	<p>keeps its campaign till target is achieved (whether representation of the workgroup is achieved or needed resources are collected to cover solution application costs).</p>

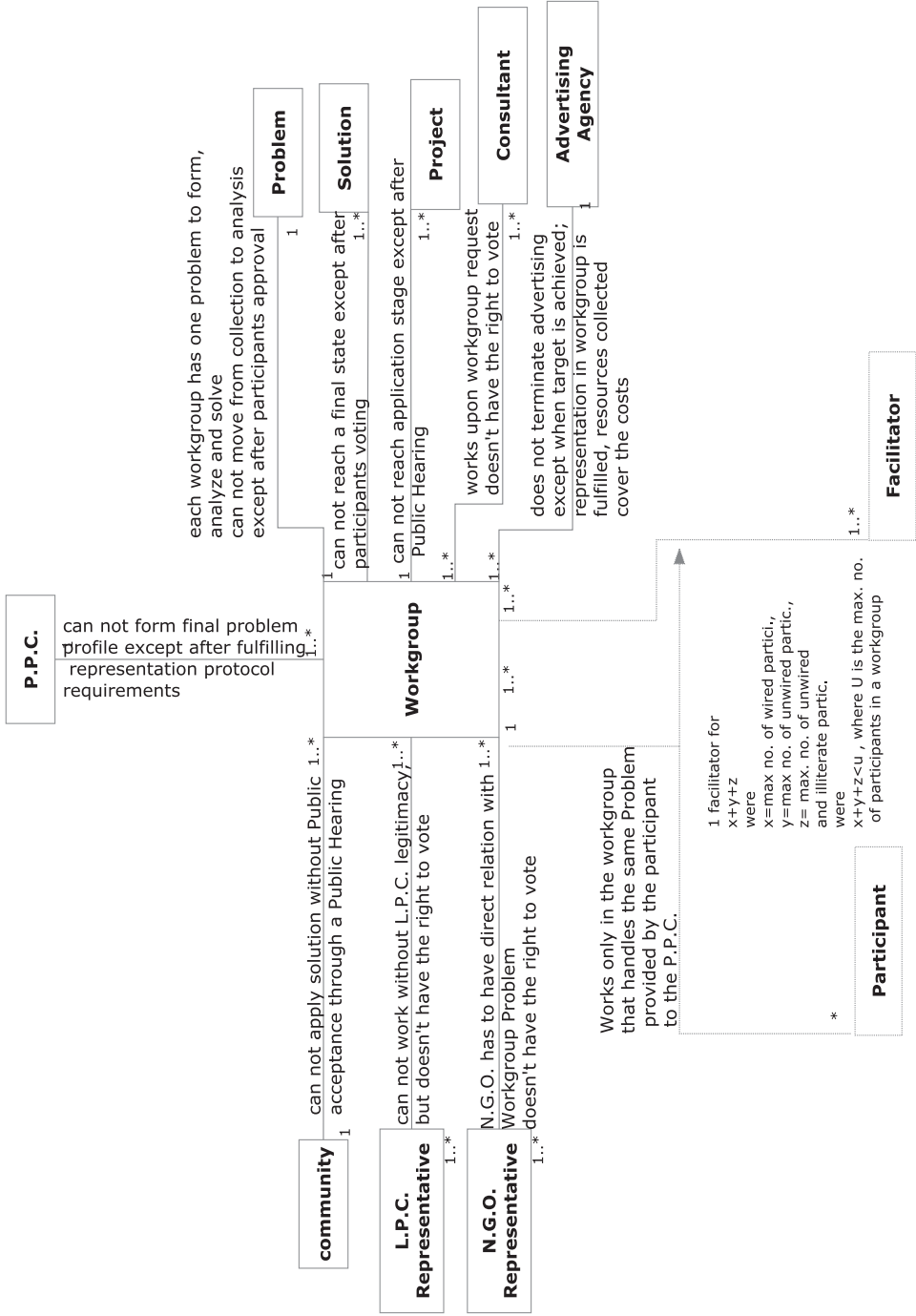


fig. 6-8: conditions governing workgroup relations
 source: researcher construction

6.2.3 COLLABORATIVE INFORMATION SYSTEM PROTOCOL

The protocol of the collaborative information system regulates the contribution of each party involved in PPP, regarding types of information provided as well as their update. There are two levels of collaboration.

The first level is the collaboration to form the central data base

The central data base has many **associations** with all agents of the model fig.6-9 illustrates associations, their types and multiplicity among agents.

Contributions of agents to the data base are listed below:

-PPC: provide data and updates about “PPC” profile, fundamental programs, resources, “workgroup” and “participant” profiles.

-workgroup: provide “Problem”, “Solution” and “Project” profiles

-Facilitator: provide data about workflow, representation, and current progress in his/her workgroup.

-Consultant: provides “Community Profile” and “Local Area Profile”. In addition he/she contributes in “Problem-Solution data bank” formation.

-NGO representatives: provide updates about NGO development programs and current achievements.

-LPC representatives: provide governmental data about local area as well as updates about LPC development programs and current achievements.

-Active Citizen: provides complaints and problems which eventually creates an archive for each problem.

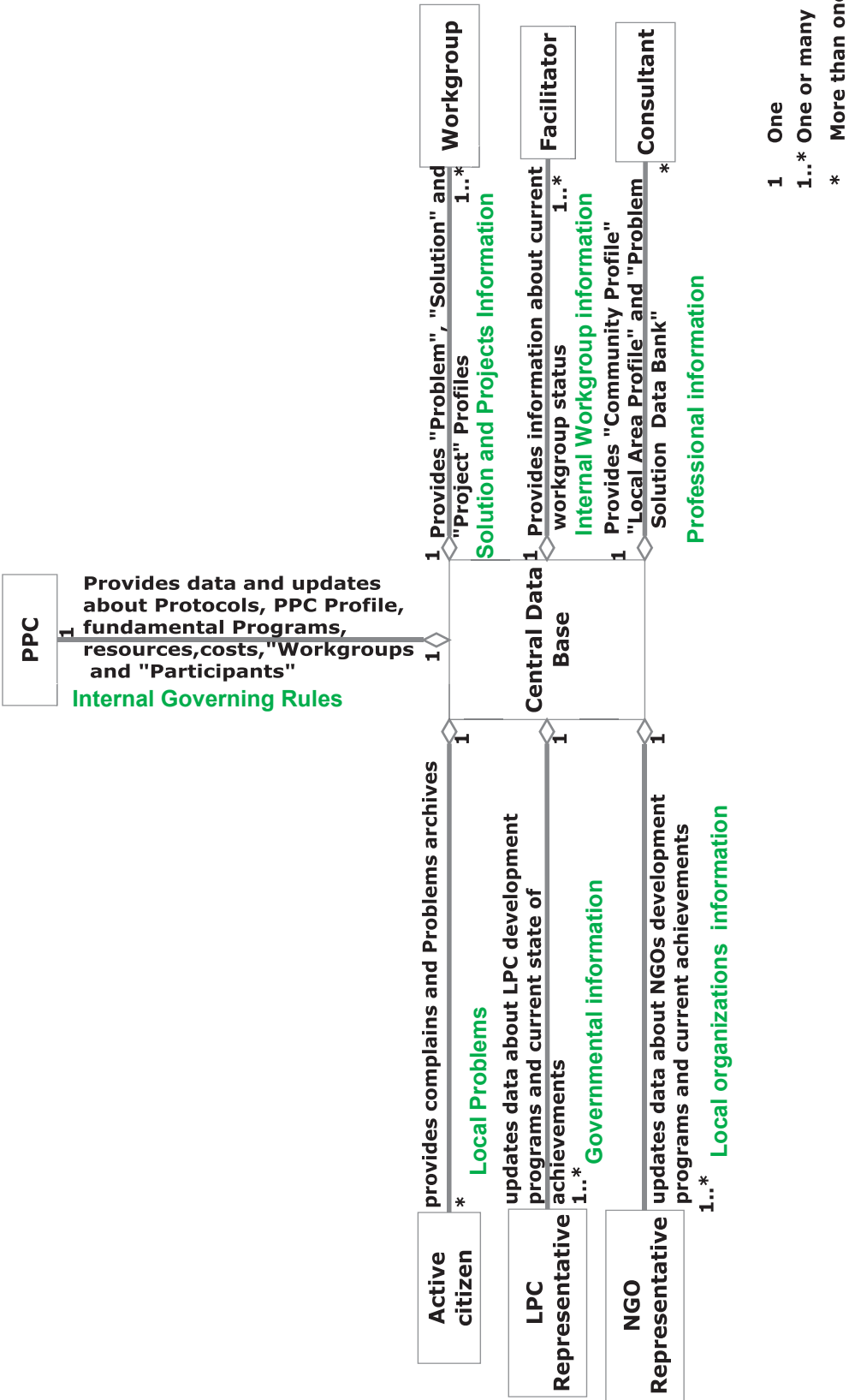


fig. 6-9: Central Data Base association diagram
 source: Researcher construction

The second level is the Collaboration to form “problem” and “solution” profiles.

Problem profile has many associations with all agents of the model. fig.6-10 illustrates associations, their types and multiplicity among agents. Contributions of agents to problem profile are listed below:

- Participant: local knowledge contributor and analyser
- workkgroup: problem profile creator
- Facilitator: problem profile digitizer
- LPC: supervisor and governmental knowledge provider.
- PPC: supervisor
- Consultant: provide multi data levels and formats
- Community: local knowledge provider through questionnaires.

Solutionprofile has many associations with all agents of the model. fig.6-10 illustrates associations, their types and multiplicity among agents. Contributions of agents to Solution profile are listed below:

- Participant: alternatives and approval provider
- workgroup: solution profile creator
- Facilitator: solution profile digitizer
- LPC: resource and legitimacy provider
- PPC: resource provider
- Consultant: customize solution to local area, help settle on evaluation parameters and studies solution impacts.
- Community: legitimacy provider through hpublic hearing

As indicated in fig. 6-10, the relation between the Problem and Solution is illustrated by a black diamond in the problem direction showing entire dependency of the solution on the problem profile and the multiplicity shows that one problem has one choosen solution, even if it had many parts or projects within it.

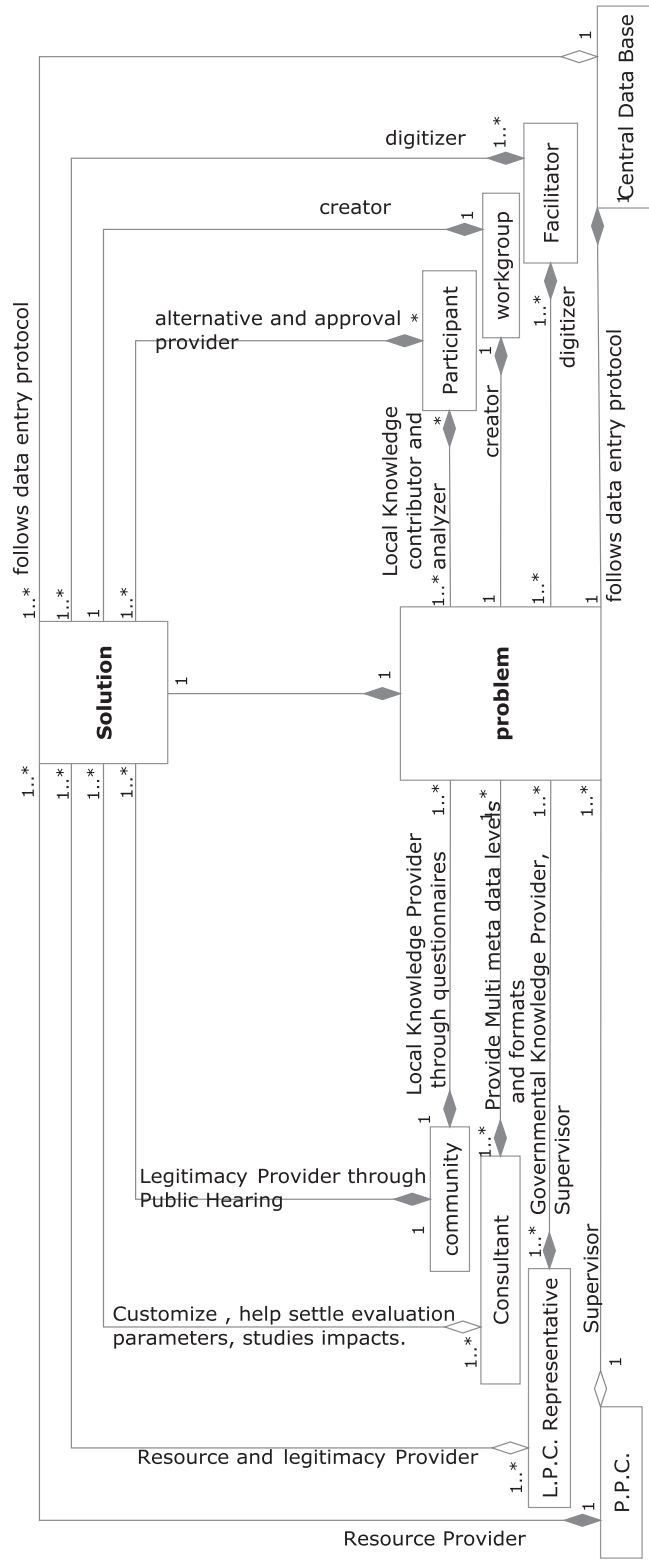


fig.6-10: Problem and Solution Association diagram
source: resercher construction

Data related to Problem profile should have quality standards in terms of sufficiency, coherency and update.

- data sufficiency: acquiring data about a problem should come from both local source (participants/community) and governmental sources(LPC, CP, LAP).
- data coherency: system should omit repetition and standardize formats
- data updating: this determine the requancy of updating the different values according to their rate of variability. i.e. changing environments which have an effect on the data analysis and so the solution chosen. For example, population demography could be have a slower frequency of updating than environmental pollution.

Data entry protocol is based typically on what's technicaly known as "Meta data"¹. In short, meta data is data about data. i.e it specifies properties such as name of provider, time of enty, etc. Table 6-2 presents an example of the Meta data specifications.

¹ ¹ According to Wikipedia, 2011, Metadata (meta-content) is defined as:
Data providing information about one or more aspects of the data, such as:

- *Means of creation of the data*
- *Purpose of the data*
- *Time and date of creation*
- *Creator or author of data*
- *Placement on a computer network where the data was created*
- *Standards used*

Table 6-2: example of data entry protocol (meta data).

Source: Laurini, 2001 (after researcher modifications).

1- General data: containing general information about the data context i.e. Problem or database in which they are included. This information concerns:
1-1-Source, author, agency (who own the data) 1-2-Title and general project (the name of the project or database where data is to be found) 1-3-Information representation (how the data is presented as number, image or text) 1-4-Geo referentiation (whether or not the data is geo referenced) Geographic extent (the special area covered by data)-1-5 1-6-Scale (level of detail or level of reasoning)
2-Variables: This is the list of the data (variables) included in the problem. For each datum information is supplied on:
2-1Typology (nominal, discrete, continuous) 2-2Use (descriptive, managerial) 2-3Geographic entity (point, line, area) 2-4Key word (defines the thematic area to which the data make reference).
3-Availability and support: this section supplies information about data retrieval by specifying if the data is ; purchasable, available upon convention, not available, support available (analog or digital), recording format, available formats for interchange.
4-Data quality and data timing: this section contains information about data quality expressed through:
4-1-Population survey samples (whether the data originated from digital photograph, analog photograph, numeric map. Analog map, grid of points, census, administrative data, or other) 4-2-Acquisition modes; how the data was captured and measured. 4-3-Types of control carried out (this concerns quality control both for the procedures of data construction and for the equipment used. 4-4-Quality responsible (within the structure or agency which built the data) 4-5-Measurement timing (whether semantic: hourly, daily, weekly, monthly, etc., or occasional) 4-6-Beginning and ending dates (when dealing with data taken occasionally) 4-7-Dates: of data, of publication, of next collect, digitizing (when dealing with data taken occasionally)
5-Bibliography and annotation: this section supplies information on possible bibliographic references.

6.3 AGENTS FUNCTIONS OF THE PPP MODEL

Functions of the PPP model are decomposed and distributed among the different agents. This is done according to MAM's decomposition concept in dealing with complexity. Each agent has a set of functions. These functions are presented in the Use case diagram of each agent.

Appendix C provides description of the full list of UML diagrams including Use case notations.

Functions are usually decomposed into a set of sub-functions. The "includes" notation used in the use case diagrams indicates this type of functional decompositions.

Sub-sections 6.3.1 through 6.3.13 presents functions decompositions of each agent.

6.3.1 INITIATOR (DONOR) FUNCTIONS

The role of the initiator in the model decreases gradually through time from a fundamental role to that of supervision. At the beginning, the initiator performs all responsibilities and tasks. Once a PPC is formed, tasks and responsibilities are gradually transferred to it, while supervision of the initiator continues through representatives.

The initiator has different tasks in different packages of the PPP model. In fig. 6-11, the initiators has several tasks directed to four packages, PPC, Community, LPC and NGO. Tasks directed towards each of these packages are listed below:

Taks directed to PPC:

- Invites both the LPC and the local NGOs to take part in the PPP.
- recruits representatives from both LPC and local NGOs to become members in the new PPC.
- invites local citizens to join the new PPC and apply for facilitators jobs.

- recruits local citizens of the community to become facilitators. This way facilitators would be trusted being part of the community and would be familiar with community problems and to community members.
- establishing a (PPC) with permanent location in the area, totally independent of any governmental, political or economic entities.
- establishes local workshops for the training of PPC members.
- supports initial expenditures of the establishment of the PPC location and the training and workshops needed for its members added to the salaries and transportation expenses, where the PPC is supposed to finance itself through the resource collector (would be mentioned later in details).
- permanent technical support of the PPC through initiator's representatives.
- empowers the new PPC with all equipment's, and technical and scientific support from consultants and governmental approvals and license.

6.3.2 CONSULTANT'S FUNCTIONS

Assigned by the PPC per task to support the P.P.C. with professional knowledge and experience, the consultant has two main roles to play in the PPP model (see fig.6-12);

The first role is to assist workgroup upon its request to clarify scientific information or give advice, but has no direct power to make changes, votes or implement programs. This includes the following:

- Helps participants analyze data about problem. This includes helping participants understand various reasons behind the problem and various impacts of the problem on all aspects of life.
- Provides multi-formats and Meta data levels to correspond to difference in educational level of the participants. (See appendix G for different Meta data levels)

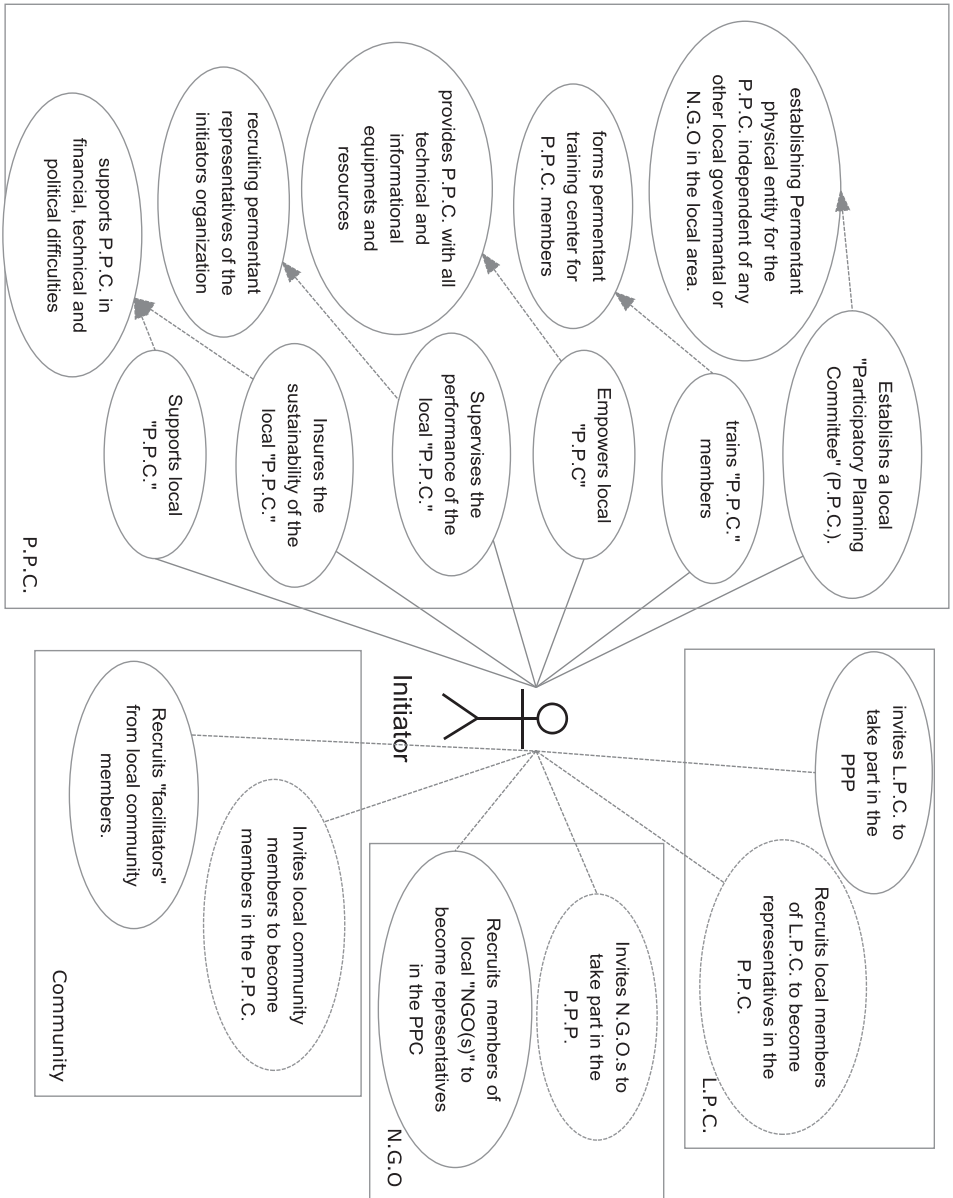


fig. 6-11: use case diagram of the "Initiator"
 source: researcher construction

- Helps in proposing parameters to evaluate various proposed alternatives
- Studies expected impacts of the chosen solution on solving the “problem” specifically and on the community and the local area generally.
- Customizes solution chosen on the local area. (This could be of great importance when the solution is of an urban nature (like constructing a bridge, school, hospital, pedestrian route, etc.) in a specific chosen location, which requires the experience of an urban planner.

The second role is to construct basic constituents of the central data base which includes:

- Creating “Problem-Solution data bank”. “Discussed before in central data base package”.
- Creating “Community Profile”. See table 6-3
- Creating “local area Profile”. See table 6-4

Tables 6-3 and 6-4 are presentations of both community profile CP and Local Area Profile LAP, showing the social, economic status, planning and environmental status respectively through representing parameters that affect PPP together with the of basic information needed for each parameter.

These parameters are drawn from the success criteria of PPP. previously discussed in chapters 2, and 5.

The main reason behind the formation of such data bases is to provide two basic information;

- Informs the PPC If community profile shows acute measures i.e critical status that could lead to future threats and disasters to the communiity, or not.
- Provide workgroups with basic information about the problem they are trying to solve.

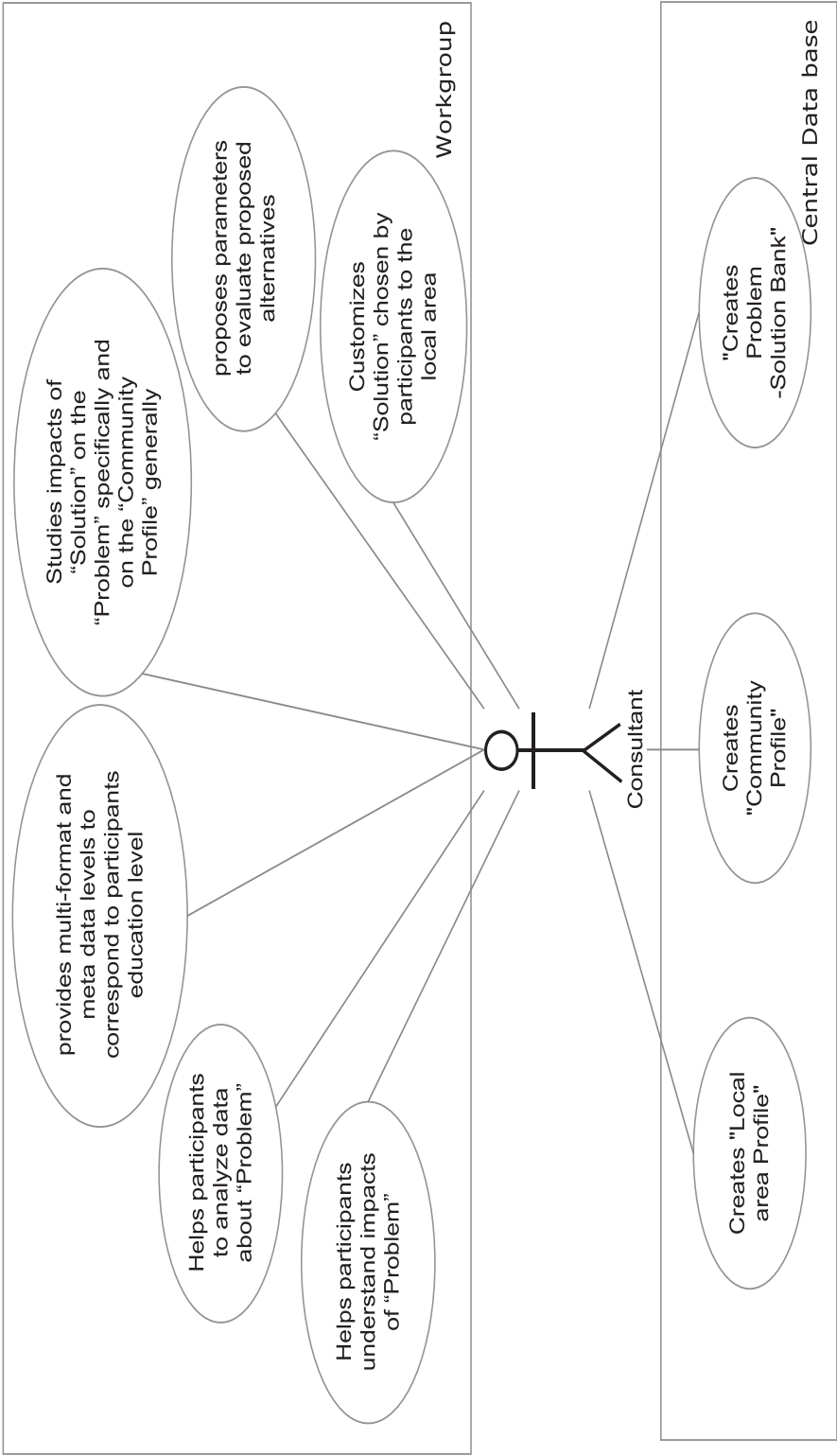


fig.6-12: Use cases of consultant
source: researcher construction

Table 6-3 : example of a “community profile” in the PPP model
source: researcher construction

Community Profile		Basic Information needed	Time ² between updates
Social Cohesion		-Record any social conflicts (between Muslims and Christians, different tribes and families or political interests) especially in transitional areas. (see chapter 2)	
Social Exclusion	Poverty	-Average Individual income -number of citizens with serious or epidemic diseases (Hepatitis C, H1N1 or Bilharzia for example) by gender.	
	Illiteracy	-Number of illiterates by age and gender.	
	Unemployment	Number of unemployed by age and gender	
Manpower and administrative Resources	Population	-Number of men, women, youth and children with a population pyramid	
	Local NGOs	-Scope of interest: social, economic, environmental) -number of members -resources, physical (buildings, cars, etc.) and currency. (Bank accounts).	
Economic base		-Percent of local Economic sector agriculture, commerce, industry, other) by gender.	
Local Public Council (L.P.C.)	Resources	-Budget assigned from Government -Expenditures	
	Administration capabilities	-number of employees -level of training and education -physical empowering control tools)	
Major social Threats		-child labor because of high Poverty rates -drug dealers and smugglers because of lack of security and surveillance. -High mortality rates because of a certain disease. -Others	

²Time between updates needs a further study that is out of the scope of the model requirements, but still has to be mentioned because of its importance.

Table 6-4 : example of a “Local Area profile” in the proposed model
source: resercher construction

Local Area Profile		Basic Information needed				Urban	Rural	Slum Urban	Slum Rural	Time between updates									
Infra-structure	-Sewage																		
	-Water Supplies																		
	-Electric supplies																		
	-Movement networks																		
Services and Facilities	Educational (Schools, etc.)																		
	Recreational (Parks and open Spaces , Youth Centers, etc.)																		
	Markets (retail and whole sale)																		
	Hospitals, health units and Clinics																		
Natural		E.g. Water streams, underground excavations, soil fertility, touristic attractions, etc.)																	
Identity		historic valued buildings- architecture/ places)																	
Environment Status	Built	Buildings according to Health/ Safely/ Legitimacy																	
		Roads																	
	Natural	Air																	
		Water																-% of air pollution -kind of pollutants	
		Soil																	-% of water pollution -kind of pollutants
																		-% of soil pollution -kind of pollutants	

6.3.3 PARTICIPATORY PLANNING COMMITTEE (PPC) FUNCTIONS

The functions of the PPC in the model are various. These functions are illustrated in fig. 6-13. They are directed to different agents or agencies (the ones acted upon);

Functions directed towards L.P.C.

-activates L.P.C. development programs.

Functions directed towards local N.G.O.s

-activates N.G.O.s development programs.

Functions directed to the community:

-activates fundamental development programs (see fundamental programs in tables 6-5, 6-6 below).

-Identifies target citizens for active workgroups in fundamental programs.

-Forms the active agent "Participant".

-raises public awareness through an advertising agency.

Functions directed towards Central data base:

-creates "workgroup protocol". (Discussed earlier)

-creates "data entry protocol". (Discussed earlier)

-creates "Active citizen's records". (Discussed latter in section 6.5.1)

-creates "Participants records". (Discussed latter in section 6.5.1)

-creates "fundamental development programs"

Fundamental programs are responsive to any threat shown in either the CP or the LAP. If, for example high death rates among commuters result from unsafe transportation stations, epidemic disease like H1N1, etc, then the PPC should react immediately with a program (known as fundamental) to reduce that threat. These fundamental development programs initiated by the PPC. follow an "If, then" scenarios which are stated in tables 6-5and 6-6 corresponding to CP and LAP measures respectively

Table 6-5 : Fundemantal programs corresponding to C.P. measures

Source: researcher

C.P.		Fundamental development programs
Social Cohesion		-If Social cohesion is missing then initiate programs to resolve conflicts and strengthen community sense among citizens.
Social Exclusion by Gender (Men-women-youth/children)	Poverty	-If average Poverty level is high (threshold by United Nations as 2 \$/person/day), then initiate micro loans programs.
	Illiteracy	-If illiteracy prevails, then initiate fighting illiteracy campaigns, after school classes and school reforming programs.. If illiteracy level is high in certain gender, then initiate classes according to gender.
	Unemployment	-If unemployment prevails, then initiate vocational training according to economic base and market demands.
	Population	-If population pyramid is unbalanced (high infants mortality rates), then initiate infant health programs, vaccinations and mother campaigns.
Local NGOs)		-If local NGOs exist, then initiate training programs members. -If more than an NGO exist in the area, then initiate a program to collaborate NGOs resources and missions.
Economic Base		-If local area has a major economic crisis, then initiate economic (agriculture, industry, commerce, etc.) support programs.
Local Public Council L.P.C.	resources	-if L.P.C. resources are low, then initiate L.P.C. financial support programs.
	Administration capabilities	- If L.P.C. administration capabilities are low, then initiate programs to enhance them.

Table 6-6 : Fundemantal programs corresponding to LAP measures
Source: researcher

L.A.P.	Fundamental development programs	
Infra-structure	<p>If local area has not acquired adequate infrastructure yet, then coordinate with governmental plans to;</p> <ul style="list-style-type: none"> -Implement infrastructure -upgrade -Complete -increase capacity 	
Services and Facilities	<p>-If local area is deprived from adequate services, then initiate program to provide them.</p>	
Natural	<p>-If natural resources are endangered, then initiate preservation programs and raise public awareness.</p>	
Identity	<p>-if local area has urban historic value and is endangered, then initiate preservation and renovation programs (if needed).</p>	
Environment Status	Built	<p>-if built structures in the area are threatened or unsafe, then initiate evacuation and movement programs.</p> <p>-if earthquake belts or flood drains exist in the built area, then initiate evacuation programs until safely limits.</p> <p>-if high voltage electric lines are penetrating the urban pattern, then initiate programs to turn them into underground lines.</p> <p>- if Width of roads doesn't permit the movement of ambulance and fire extinguishing cars, then initiate programs to ensure safety of ambulance entrance and fire extinguish hoses.</p> <p>-if high ways, or rail way roads penetrate the urban pattern and threaten lives of community members, then initiate programs to cure situation.</p>
	Natural	<p>-if % of pollutant in (air, water or soil) are beyond bearing capacity and could cause lethal effects of human and living environment, then initiate natural preservation programs and increase local awareness.</p>

Functions directed towards workgroup:

-Forms workgroups which includes;

- Assigning a facilitator, a LPC and NGO representatives.
- Maintains level of representation of the workgroup to the problem it is solving especially those concerning the success criteria of the P.P.P like the social exclusion (poverty, illiteracy and unemployment). This representation concerns both the percent of number of participants in the workgroup to target group number (people affected by the problem) and gender/age representation according to nature of problem.
 - If participants' number or kind is not representing the problem, then, increase awareness through advertising (to targeted citizens or participants) to increase no. of participants, until the required representation is fulfilled.
- Maximizes number of participants in the workgroups to allow for emergence of collective intelligence, by keeping all the participants in all workgroups aware of the other workgroups and their problems, so that each participant could join more than one workgroup according to equivalence and convenience. This function could be done through web mining(see chapter three) as follows;
 - If "participant" is a woman, send invitation to join current workgroups working on women problems in local area.
 - If "participant" is a youth, send invitation to join current workgroups working on youth problems in local area.
 - If "participant" is illiterate, send an invitation to join current workgroups working on illiteracy problem.
 - If "participant" is unemployed, send an invitation to join current workgroups working on unemployment problem.

Maximizing number of participants could also be done through self-replication mentioned in cellular automata (see chapter three), as follows:

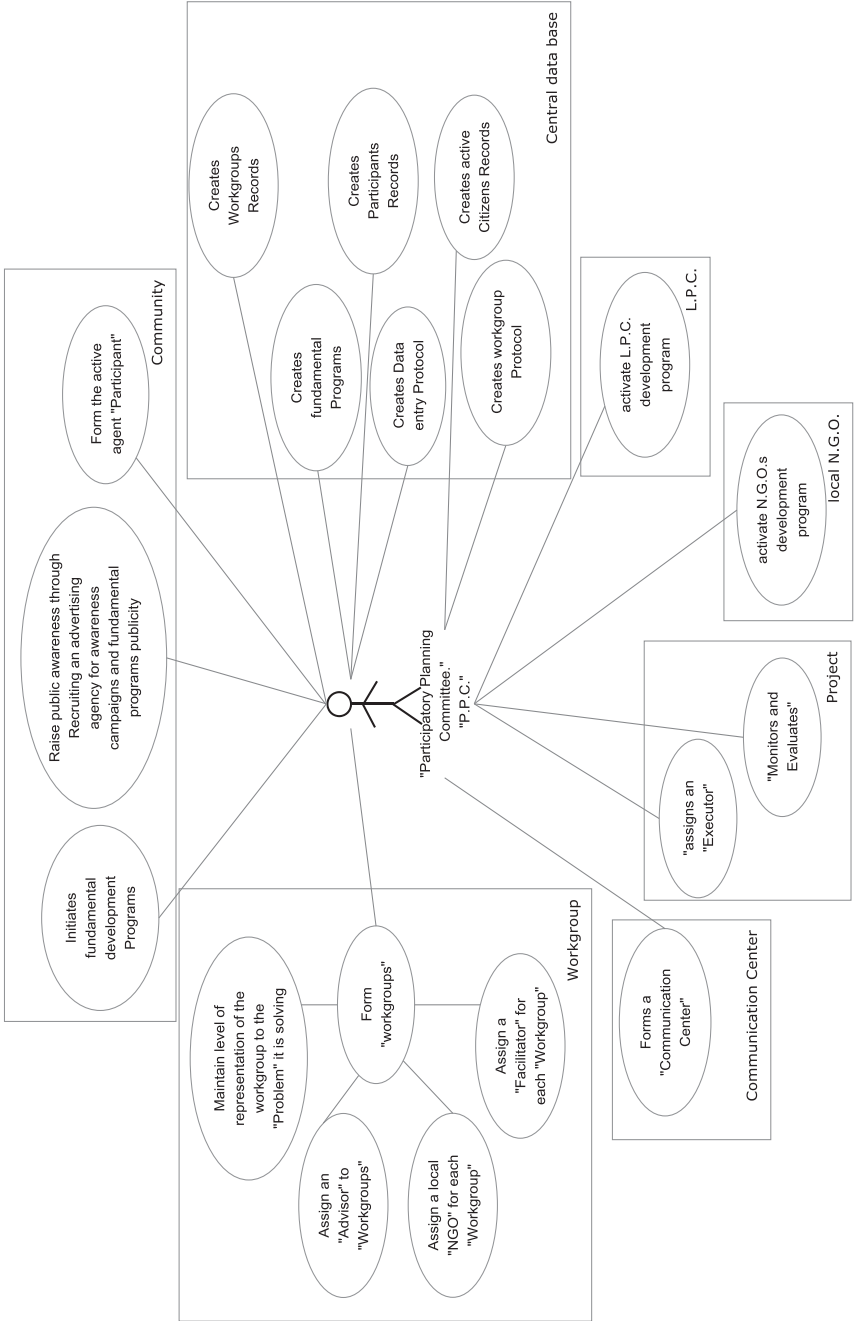


fig. 6-13: PPC Use cases source: researcher construction

If a workgroup is working on a small scale problem (Safety or cleanliness and garbage collection in one street), then this workgroup could be replicated. PPC could send invitation to other citizens in other streets, suffering the same problem to form workgroups and make use of the previous experience of the mother workgroup.

Functions directed towards communication center:

-forms a communication center (see details below)

Functions directed towards project:

-assigns an executor

-monitors and evaluates

6.3.4 INITIATOR REPRESENTATIVES FUNCTIONS

The role of the initiator representative is to supervise the performance of the PPC to make sure that it abides with the success criteria of PPP and that it meets the initiator targets (which is the same as the PPC targets).

6.3.5 LPC REPRESENTATIVES FUNCTIONS

LPC representatives roles are directed to three agents; the PPC, the represented LPC and the concerned workgroup. Each is illustrated in fig.6-14 and detailed as follows:

The first is directed to the PPC through attending training courses and workshops. These courses and workshops would help them in performing the other two roles;

The second is directed internally toward the LPC to activate development programs which includes;

-Improving management and administration of the urban growth in a decentralized way that gives it greater authorities rather than the top down hierarchal chains of approvals and red tape.

-forming governmental information network between different LPCs in the same governorate to enhance collaboration and cooperation in many fields.

-updating CP and LAP to keep the LPC informed about the local urban, economic and social environments.

-empower LPC with new adequate equipment to prohibit unauthorized urban growth.

The third is directed to the role of the LPC representative in the PPC this role concerns leading the cooperation between the “workgroups” and the “LPC” This cooperation includes the following;

-facilitates the legislation of projects and decrease bureaucracy.

- providing legitimacy to the workgroups by involving the government into the “PPC” activities and its workgroups.

-providing workgroups with governmental information on the problems they are solving.

-Assist workgroups by providing governmental information about “Problem” at hand.

-facilitates and protects the Public hearings.

-providing governmental resources (including vacant lands) to help the execution of solution and projects.

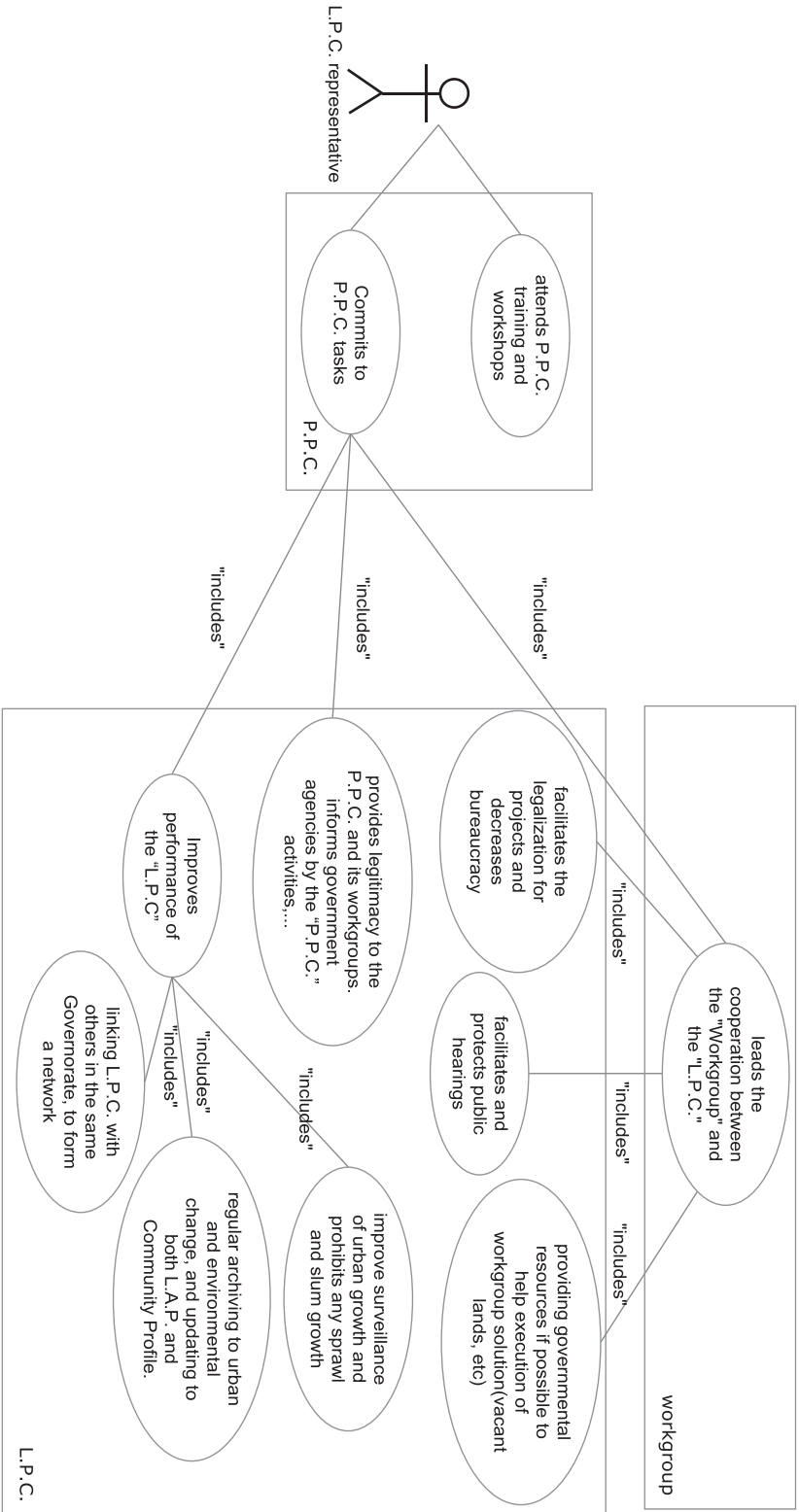


fig.6-14: Use cases of LPC representative
 source: researcher construction

6.3.6 NGO REPRESENTATIVES FUNCTIONS

NGO representatives roles are directed to three agents; the PPC, the represented NGO and the concerned workgroup. Each is illustrated in fig.6-15 and detailed as follows:

The first is directed to the PPC through Attending training courses and workshops. These courses and workshops would help them in performing the other two roles;

The second is directed to the development programs in the NGO which includes;

- collaboration with other local NGOs to serve community needs
- cooperation with other national or international NGO. to empower and improve services provided to the community.

The third is directed to the “workgroup” in order to lead the cooperation between the “workgroup” and the NGO. This cooperation entails;

- Conducting fund raising campaigns internally (inside the community) and externally (nationally and internationally). Having the authority to collect funds and donations the NGO is the best party to lead the fund collection process.
- Providing a place for workgroup meetings if needed (either in the NGO or hiring a bigger place, if the number of participants exceeds the NGO’s capacity). This gives the legitimacy of the gathering under the supervision of both the NGO and the LPC.
- Help implementing “Projects” of the workgroup whenever possible.³ This is a dual benefit to the community where the local people are not only planning their own projects, but also constructing it themselves.

³ This actually happened in MN where donations were given form the Japanese embassy to one of the local N.G.O.s to perform the task of renovating classes in local schools. They performed all the carpentry and roof gardening.

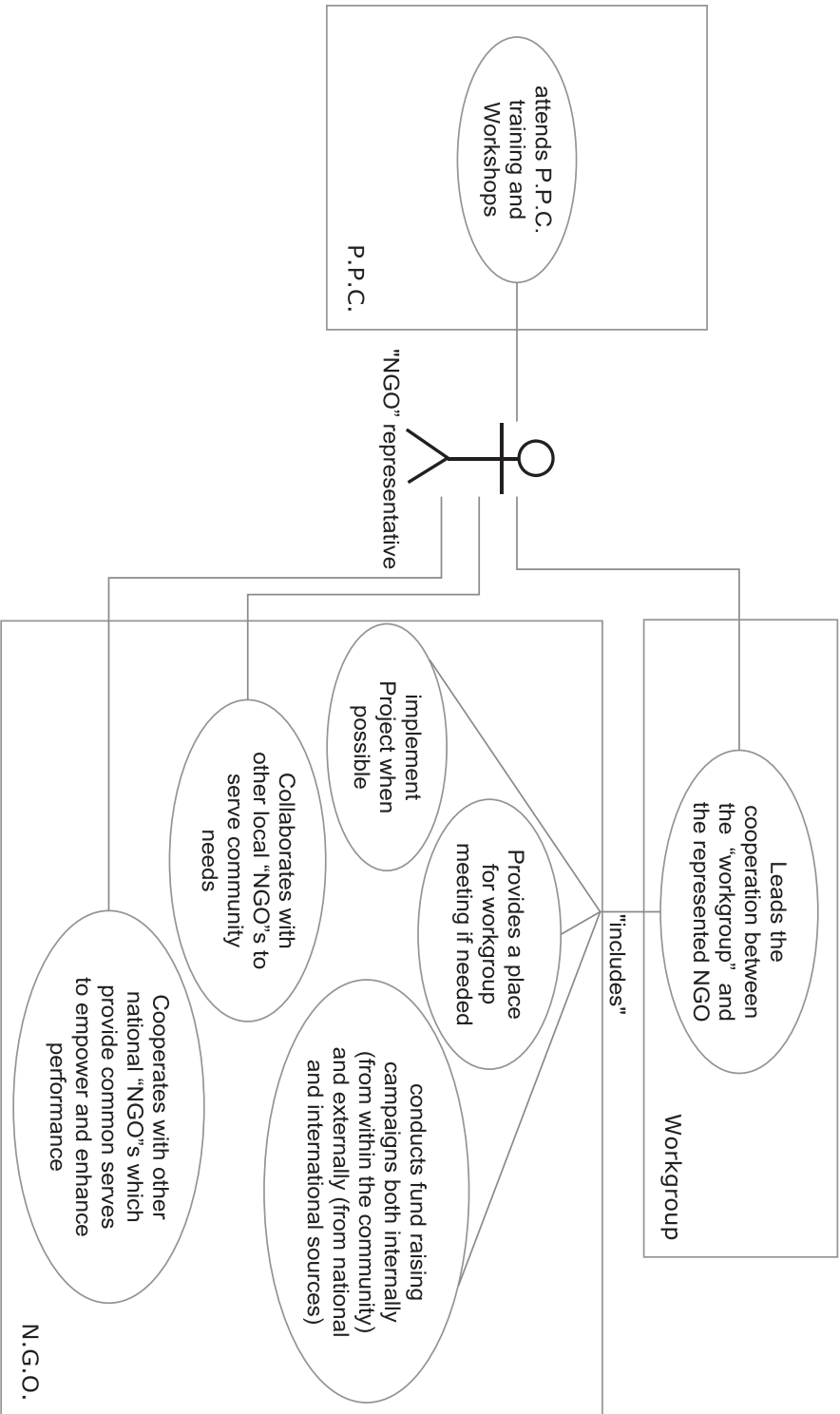


fig. 6-15: Use cases of N.G.O. representative
source: researcher construction

6.3.7 RESOURCE COLLECTOR FUNCTIONS

Resource collection in this model differs from the general comprehension of the conventional PP, where it redefines the word “stakeholder”.

The conventional PP defined the stakeholder as the one who has a financial or political stake to insure a heard voice in the decision making process. Through this definition, the World Bank admitted shifting from participatory planning to stakeholder planning, and denied poor participants their voices because they don't have a financial or political back up. (see chapter 1 for quotations from the World Bank source book announcing this shift).

The previously mentioned self-referentiality of workgroups mentioned earlier in workgroup protocol helps in shifting the finance of PP from stakeholders to participants. The proposed PPP model defines every participant to have a stake in the decision making process which is his/her voice, away from any financial or political influence.

In Conventional PP, participants worked on multiple projects and problems of the whole community, and then proposed them to the donor and stakeholders to choose “which of my projects and problems do you want to finance?”.

On the other hand, the proposed model organizes participants in groups each to work on one problem which is really and deeply concerning each participants own interest, and then searches for the appropriate donor amongst the national and the international community to finance a clearly defined problem or project.

Participants this way don't have to look for resources to solve multiple problems and then be glad if any of them were financed, but it opens various choices in front of them to search for a donor for one problem (the workgroup problem) and increases chances of success in finding a donor. The resource collector also has various roles to play supporting many agents.

This is shown in fig. 6-16 which illustrates the Use cases of the resource collector that are summarized as follows;

The role of the resource collector in the PPC is to cover the following expenses:

- Salaries of facilitators, representatives of LPC and NGOs,
- Training courses and workshops,
- Consultancy expenses for the formation of the “community and local area Profiles” and the workgroup support,
- Activating fundamental programs, and the cooperation with governmental agencies and ministries to share in their finance,
- Workgroup expenses including transportation, meetings and public hearings
- Communication center expenses including all devices (computers, cell phones, suggestion boxes, internet links, etc.)

Functions concerning “Problem” and “Solution”:

-sort out problems into different aspects and sort out national and international donor organizations interests into the same categorization. This way when a workgroup is working on an unemployment problem, then nominees to fund their solution could be easily sorted, and addressed (like the social development fund organization, vocational training funds of the Japanese embassy, micro funds of el-ahly bank, etc).

Functions concerning “Project”:

Covers expenses of implementation and executor.

- Functions concerning “Advertising agency” covers all expenses of national or international), but it also strengthens the idea of community responsibility and ownership of any solution and project it adopts, advertizing agency campains especially those which encourage internal fund raising among the target citizens, (for example if the problem is garbage collection in one of the community’s streets, then the commuters living in that street are the target citizens who can finance the purchase of large garbage boxes for instance). This internal funding doesn’t only take away some of the expenses burden off the main donor (be it governemntal, national or internation), but it also profounds the idea of community responsibility and ownership of any solution and project it adopts.

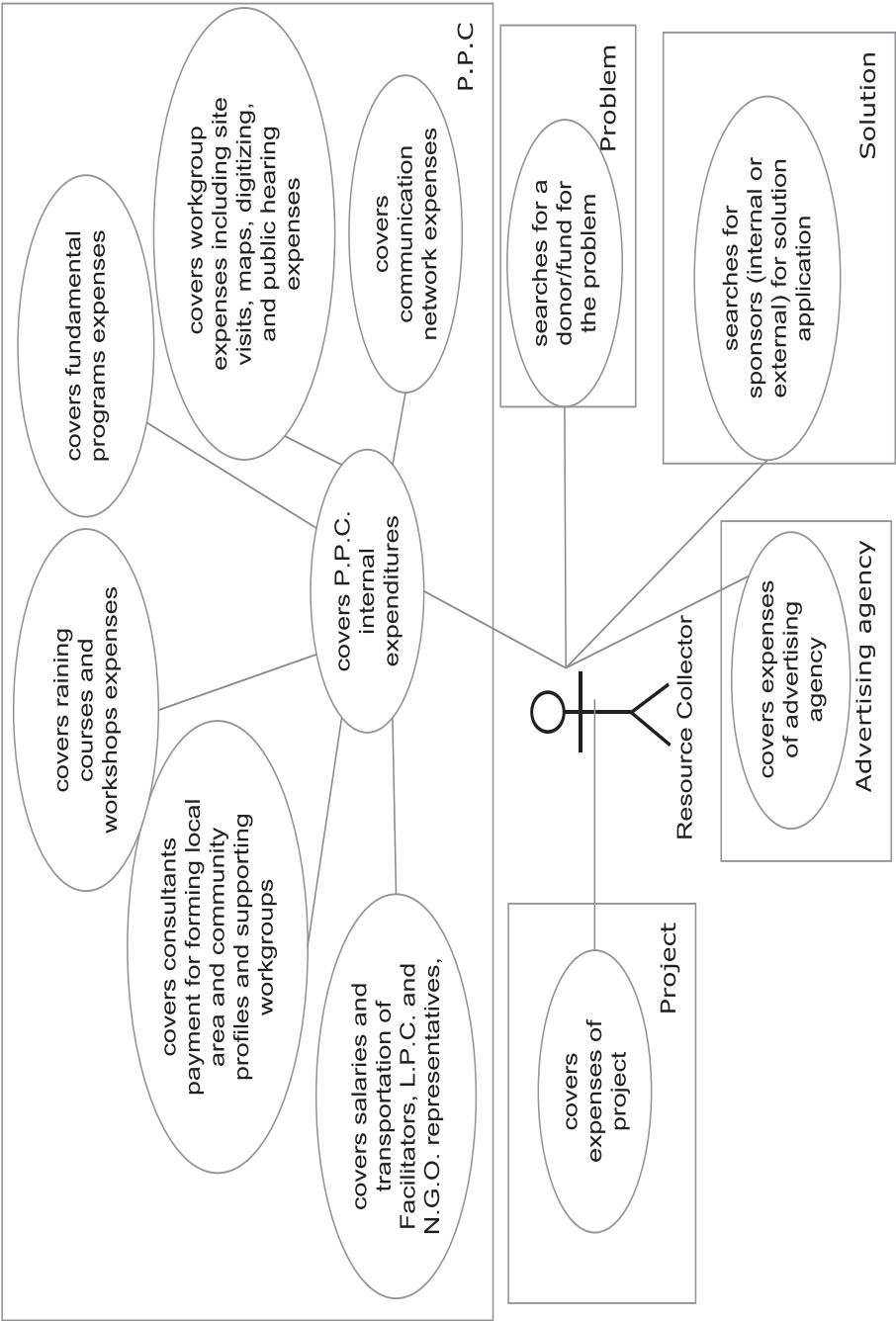


fig. 6-16: Resource collector Use case Diagram

source: resercher construction

6.3.8 WORKGROUP FUNCTIONS

The workgroup is a very important agent in the PPP model where its role is to provide problems, solutions and projects. All other agents are helping this agent do its job. The agent “workgroup” has both a physical and a digital entity in the model.

Roles of the workgroup are illustrated in fig. 6-17 and explained as follows:

- Form the “Problem Profile” which includes entering data collected about the Problem and approving it, and analyzing the problem and approving analysis.
- Form the “Solution Profile” which includes proposing alternatives, settling on evaluation parameters, evaluating solution alternatives, voting for the best solution, studying impacts of chosen solution, and finally customizing solution to the local area.
- Forms project profile which includes studying the application specifications including phases of execution, time schedule, costs and so forth. It also includes the monitoring and evaluation of the execution of the project and the correction of any errors in the application or in the specifications to ensure the confirmation of the targets of the project.
- Identify target citizens and collects local knowledge through questionnaires distributed among target citizens.
- Collecting internal resources from the community through the NGO representative and under the NGO’s authority.

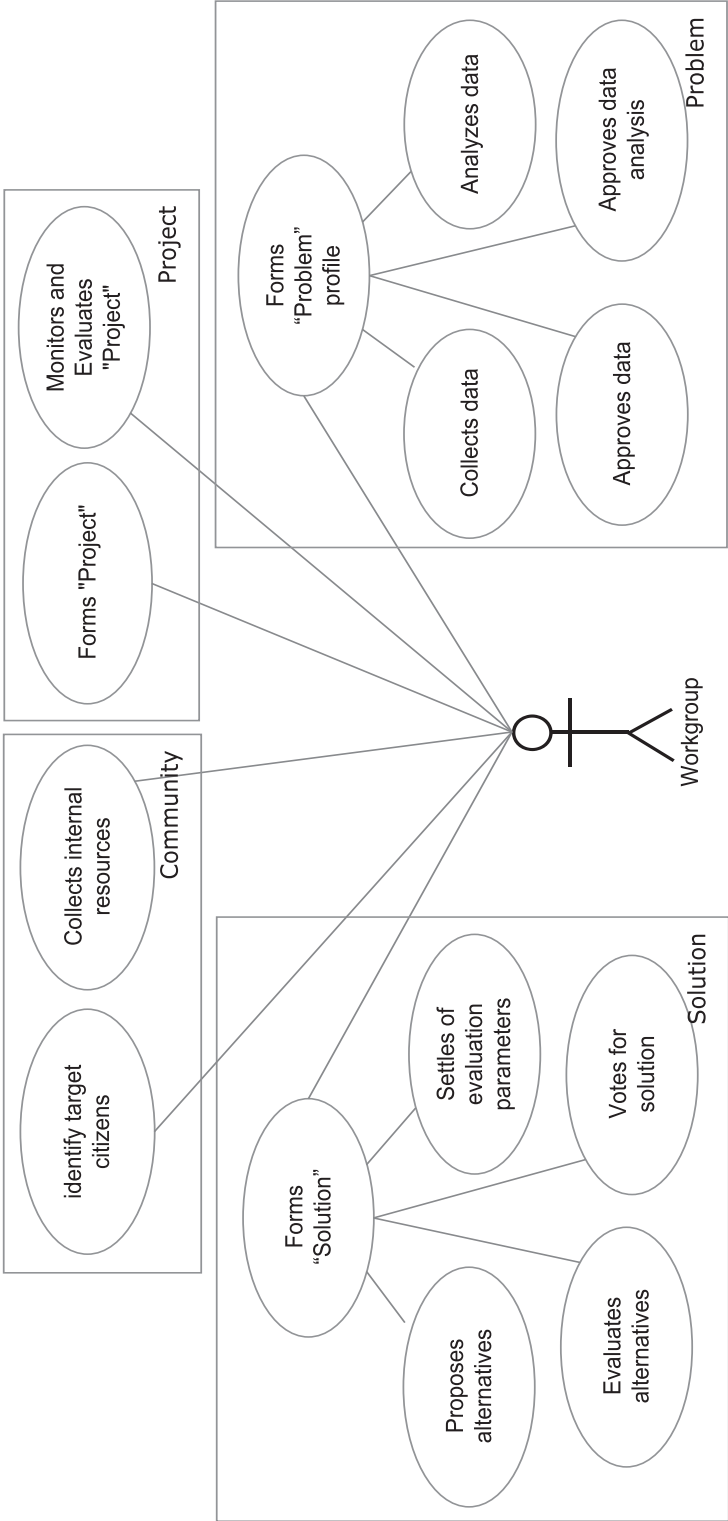


fig. 6-17: Workgroup Use case Diagram
source: researcher construction

6.3.9 FACILITATOR FUNCTIONS

The agent “facilitator” has both a physical and a digital entity in the model. Fig. 6-18 shows the roles of the facilitator in both the P.P.C. and the Workgroup.

In the P.P.C.:

- Attends training courses and workshops
- reports the workgroup representation and composition, participants commitments and achievements,

In the Workgroup

- Forms a workflow activity model (see table 6-7 for an example of a workflow chart) with a time schedule. This model should include PPP functions required from the participants.
- Assigns each participant to at least one task (chosen by the participant) in each of the workgroup use cases; form the “Problem and “Solution” profile.
- Ensure that each task of the workflow activity is fulfilled according to time schedule.
- Sends reminder messages to each “Participant” concerning tasks they have to do or meetings they have to attend.
- Conducts workgroup meeting.
- Helps participants locate their position and the location of the problem on the local area's map.
- Include site visits to similar problem location in different areas. (On-site learning)
- Resolves conflicts between “participants”.
- Argument documentation: to ensure transparency of the decision taken, participants arguments should be documented in face to face meetings.
(See appendix H for an example of argument documentation)
- Digitizes data and confirms the digital identity of the workgroup

In the community

- Organizes a Public hearing on the solution chosen by the workgroup.
- Any "solution" agreed upon from the "workgroup" should go through a public hearing in the local area. If public accepts solution, the "workgroup" should

then move to the application task, if public rejects it, the workgroup should then either find another solution, or represent the same solution with the help of an advertising agent to target higher public acceptance. If public rejected "solution" for two times, then "workgroup" should find another "solution".

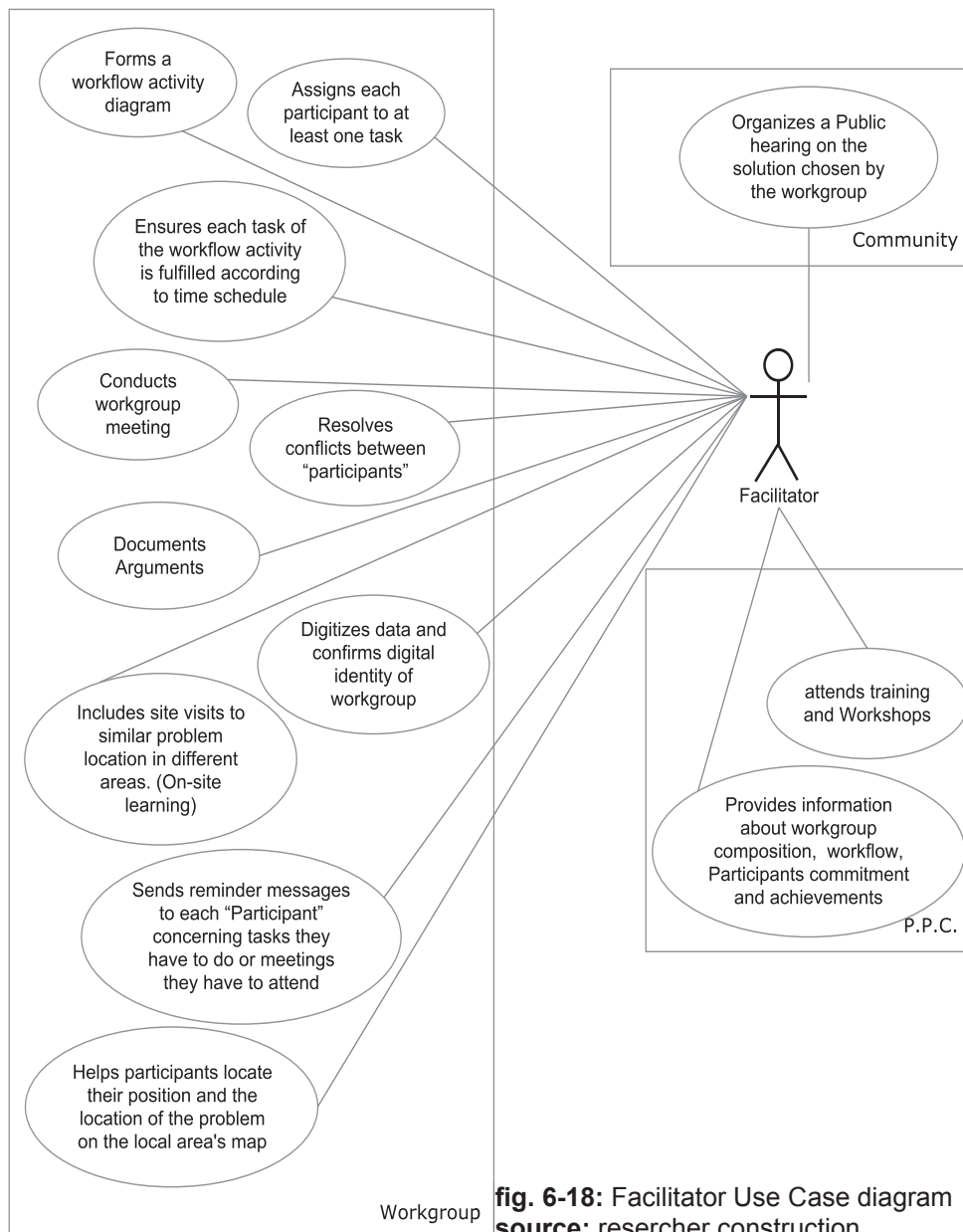


fig. 6-18: Facilitator Use Case diagram
source: resercher construction

Table 6-7: example of a workflow chart
source: resercher construction

Name of the activity	Name(s) of the participants responsible	Time Schedule		Resources required (money, material, manpower)	Checking for acceptance
		When to start	When to complete		
<u>1-Collect data about Problem</u> 1-1 images 1-2 video 1-3 Numbers or statistics 1-4 Questionnaires 1-5 Input local data 1-6 Check local data 1-7 Input Govern. data 1-8 Check Govern. data 1-9 Approve data ⁴	1-9 all participants				
<u>2- Analyze data about Problem</u> 2-1 Reasons of the problem. 2-2 Impacts of the problem: (social-economic-environmental) short run impacts/long run impacts 2-3 SWOT(Strength-Weakness-Opportunities-Threats) analysis 2-4 Approve data analysis	2-4 all participants				
<u>3- Decision Making (Solution)</u> 3-1 Proposing alternative solutions: 3-2-Checking "problem-solution" data bank. 3-3 Setting parameters to evaluate solutions 3-4 Customizing solutions to the local area 3-5 Calculating costs of solutions 3-6 Voting	3-3 and 3-6 all participants				

⁴ Approve data means that every participant should answer a questionnaire which has a form like:
 Is the data collected about the problem; useful, sufficient, correct, updated and transparent? This also applies to data analysis.

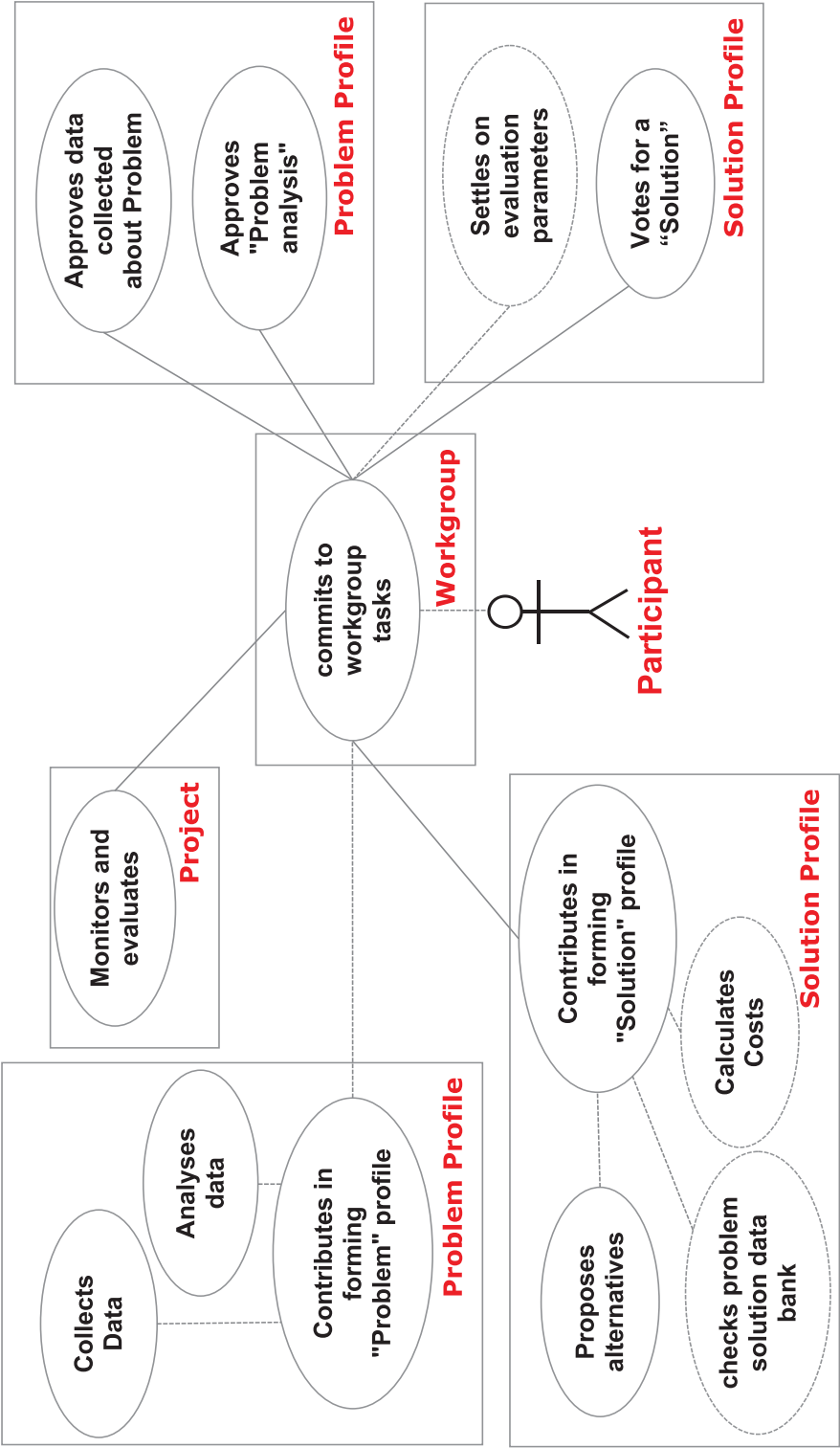
6.3.10 PARTICIPANT FUNCTIONS

His/her tasks would be chosen from the workflow diagram/chart presented by the facilitator of the workgroup.

There are obligatory tasks and optional tasks. Obligatory tasks are approvals of the data collected, and data analysis, which confirms that both are transparent, trust worthy, comprehensible, sufficient and relevant. Other obligatory tasks are the voting tasks for the best solution and for the project confirmation. They are easy and not time consuming, so as to confirm commitment and acceptance of results.

Optional tasks in the workgroup workflow presented by the facilitator and mentioned below in the workgroup protocol include collecting data through any format (written specifications, numbers and statistics through posted letter, e-mail, computer file, / audio through recorded message through telephones, cell phones, video through cell phones, etc, visual through images sent printed or digitally) analysing data which most of the times entails locating the problem on local area map, studying reasons, and impacts, etc, proposing alternatives which entails giving some details of the proposed alternative, monitoring the project and finally evaluating the achievements. Both obligatory and optional tasks are illustrated in fig. 6-19.

Just as the facilitator and the whole of the workgroup, the Participant has two entities in this model, a physical entity and a digital entity. The digital entity doesn't only apply to wired participants, but also to those who are not. This digitizing of all members of the workgroup makes it easier for those who are wired to communicate with those who are not through an efficient and reliable communication center (mentioned below in details).



Optional Tasks **Obligatory Tasks**
 fig.6-19: Participant Use Case diagram
 source: researcher construction

6.3.11 ACTIVE CITIZEN FUNCTIONS

His/her role in the model as illustrated in fig. 6-20 is to provide PPC with his/her problem/complain, and the acceptance or refusal of the proposal of PPC to join a workgroup.

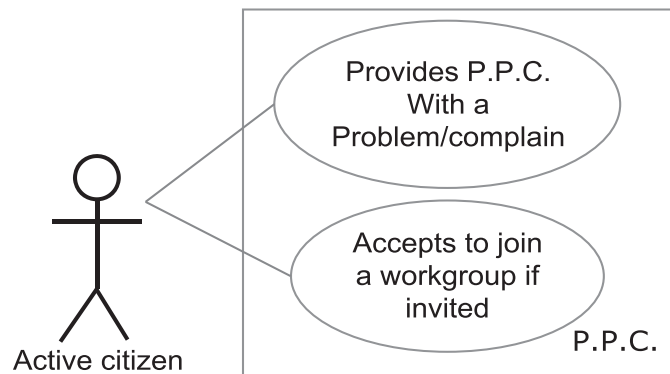


fig.6-20: Active Citizen Use Case diagram
source: researcher construction

6.3.12 ADVERTISING AGENCY

The advertizing agency has a crucial role in the PPP model to ensure three of the success criteria of the PPP. The first is to maximize the number of participants, the second is the sustainability and the self-sufficiency of PPC financially and the third is to increase public acceptance. These three roles are illustrated in the use case diagram illustrated in fig. 6-21.

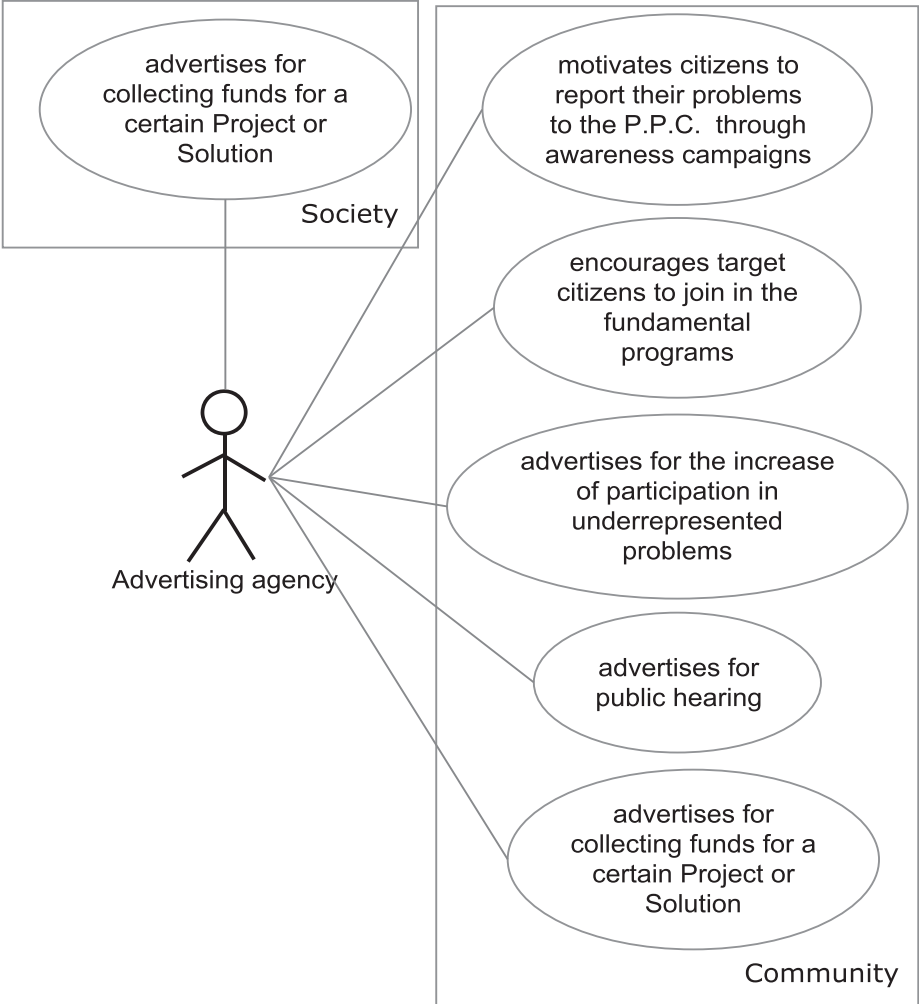


fig.6-21: Advertising agency Use case Diagram
source: resercher construction

6.3.13 COMMUNICATION CENTER FUNCTIONS

This community network offered by the communication center would also help satisfy success criteria through performing the following functions:

Increases commitment;

-Support, increase and apply whenever possible asynchronies meetings, for more convenience.

Increases transparency;

-include "argument documentation" among participants (in communication through posted letters, voice messages, cell-phone messages and images as well), to ensure transparency of every decision taken and solution chosen.

Decreases time of participation;

-ensure each agent has his/her preferable interface while performing P.P.P. (channel of input data and channel of output data could differ in the same agent).

-enhance smart distant learning through sending a Manuel Guide of PPP to each participant according to his/her education/preference.

-decrease technophobia introduced IT to illiterates should have a friendly interface, just like the cell phones they're holding in their hands. Basic touch screens and video-audio for input and output should be used in this case.

A component diagram in fig.6-23 shows how the communication center helps in forming a multimodal communication network between the PPC and community memebers.

A component is a physical building block of the system. It is represented as a rectangle with tabs. An interface describes a group of operations used or created by components Fig.6-22

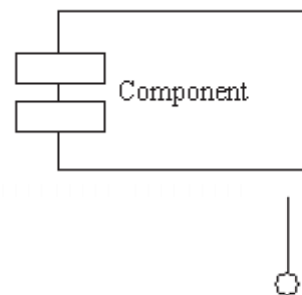


fig.6-22:Component - Interface diagram
source: smart draw tutorials

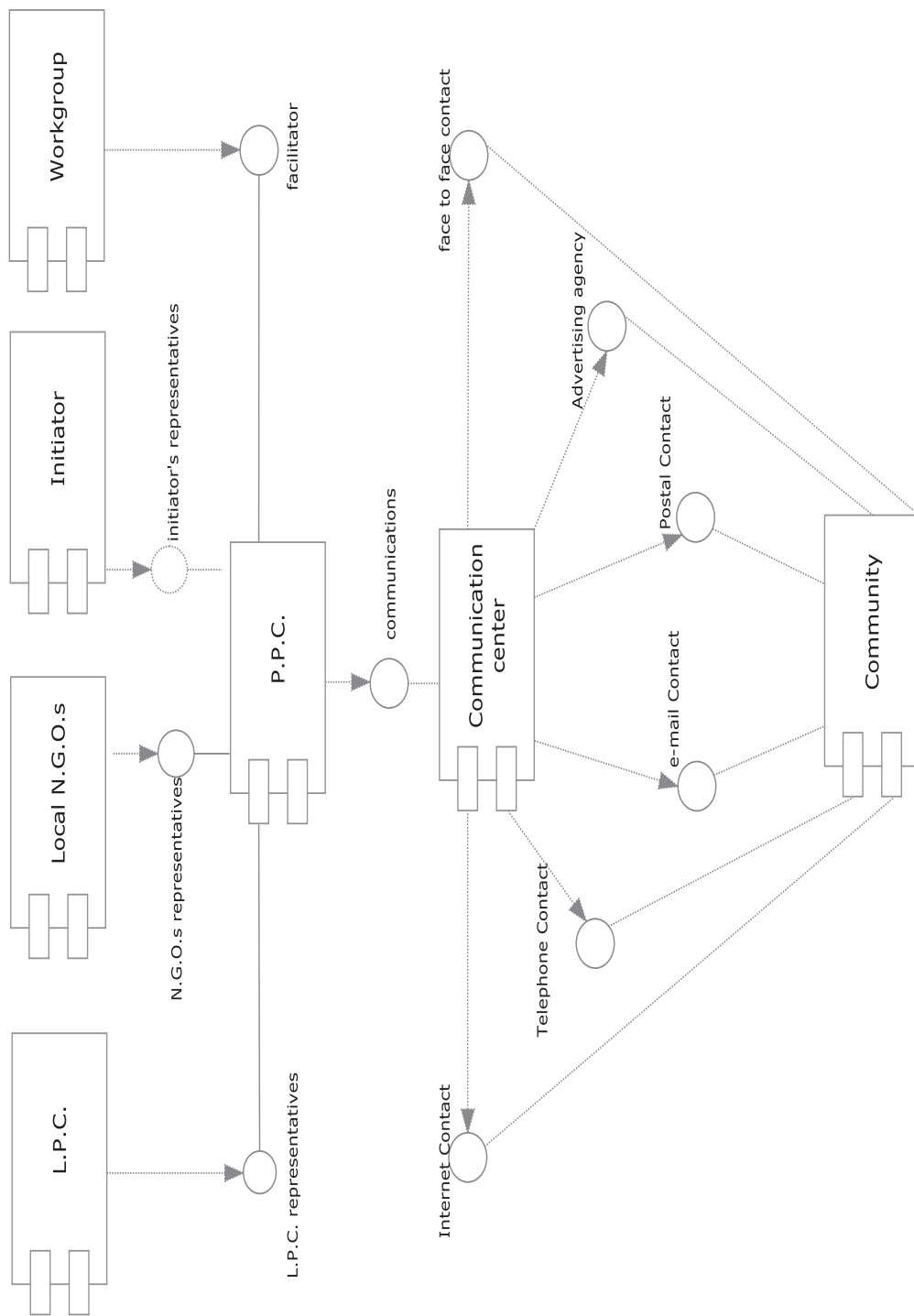


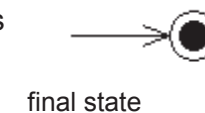
fig.6-23:Component diagram showing the communication center as link between the community and the P.P.C. through different interface
source: researcher construction

6.4 STATES AND INTER-RELATIONS OF PPP AGENTS

A state of an agent shows its behavior in response to external stimuli. There are only two agents in the PPP model which has different states. The PPC and the workgroup..



The UML illustrates such states with what's known as "State chart diagram". This diagram models the dynamic flow of control from one state to the other within the model.



Initial State: A filled circle followed by an arrow represents the initial action state.

Final State: An arrow pointing to a filled circle nested inside another circle represents the final action state. See fig.6-24

fig. 6-24: Initial and final states notations
source: smart draw tutorials

6.4.1 PPC STATES

The PPC state is not constant throughout the model. PPC assumes two states. The "**Reactive**" State and the "**Pro-active**" state. The state chart diagram in fig. 6-25 shows these two states and the conditions controlling the transition between them. It is worth mentioning that there is no final state for the PPC. i.e it is continuously alternating between the two states , a fact that confirms its built in sustainability.

Conventional PPC starts with a **Reactive state** in response to citizens specific problems or topics. The first move has to come from the citizens. Once CP or LAP shows any threats to the community, the PPC has to change to the **Proactive state**.

For instance if there is "Community Profile" or/and "Local Area Profile" shows a measure which threatens lives of commuters directly (an epidemic disease like the H1N1 for example) or indirectly (unsafe buildings or polluted water supplies for example), PPC should provoke a fundamental that mitigate such a threat.

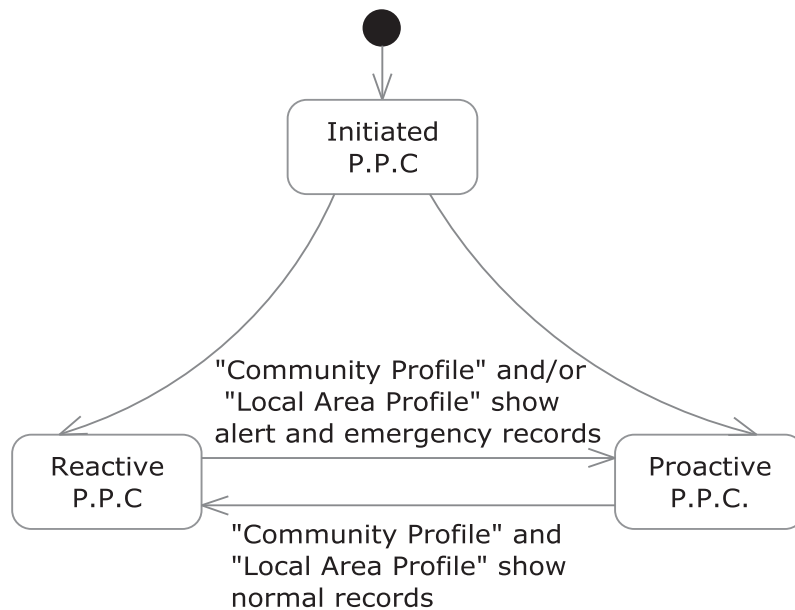


fig. 6-25: P.P.C. state chart diagram
source: resercher construction

6.4.2. WORKGROUP STATES

The workgroup state is not constant throughout the model. workgroup assumes two basic states. The “**Active**“ State and the “**In-active**” state. The state chart diagram in fig. 6-26 shows these two states and the conditions controlling the transition between them.

Conventional workgroup starts with an inactive state. i.e it does not perform all functions of the workgroup mentioned above. Once it achieved the required level of the number, gender and representation of the target citizens, it changes to an active state. i.e performing all functions.

The workgroup resume its active state by activating advertising campaigns. It is worth mentioneing that once all functions are completed , the workgroup reaches its final sate (stops functioning).

The functional difference between the two states is that while the “active state” can perform all of the above functions, while the “inactive stae” could only perform partially forming the “Problem Profile”. This means that the workgroup could only collect data about the problem at hand, and analyse

these data, but can't finalise the "Problem Profile" because no approvals could be done with a non-representative participation.

The workgroup moves from the "Active state" to the "inactive state" and vice versa according to the representation level mentioned earlier in the workgroup protocol.

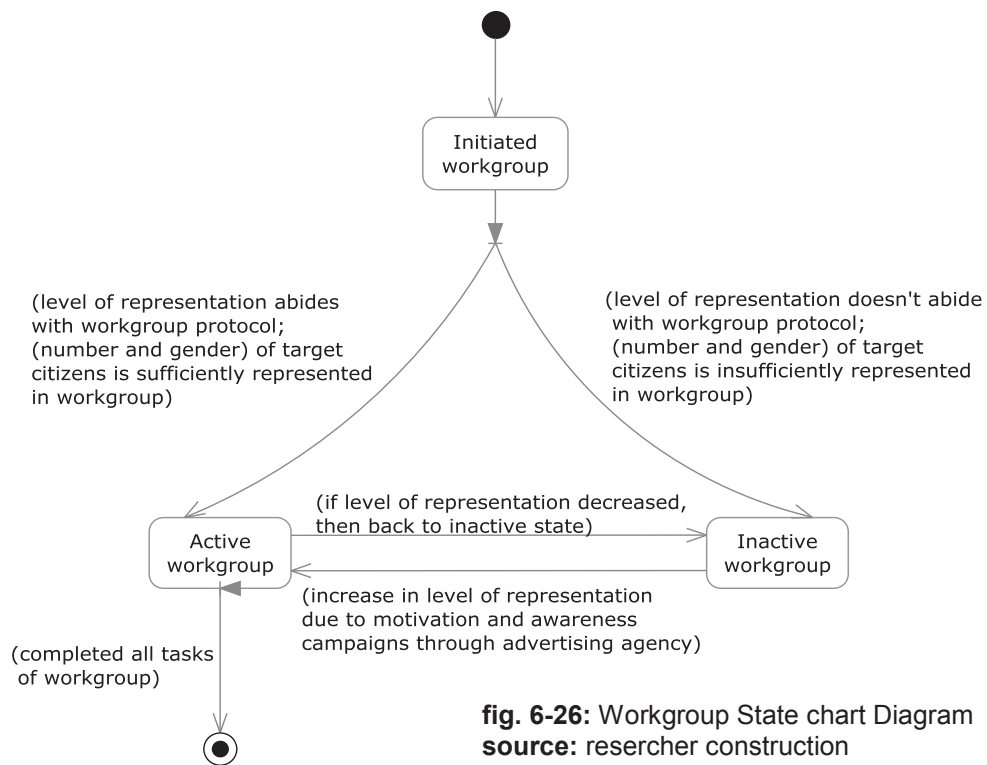


fig. 6-26: Workgroup State chart Diagram
source: resercher construction

6-5 MAJOR ACTIVITIES OF THE PPP MODEL

While the use case diagram illustrates the functions of each agent, the activity diagram shows the work flow between different agents to perform major activities of the model.

There are four main activites of the PPP model :

- formation of "Active citizen record", "Participant Profile" and "Workgroup"
- formation of "Problem Profile".
- formation of "Solution Profile".

-Monitoring and Evaluation of “Projects”

Activity diagram has a multi column format, each column is assigned to a specific agent. A single column includes functions of an agent and their transitional conditions. Progress of the overall activity of the model is indicated by arrows passing through the columns (borders). Each of these diagrams is explained in 6.5.1 through 6.5.4

6.5.1 ACTIVITY OF FORMING “ACTIVE CITIZEN RECORD”, “PARTICIPANT” AND “WORKGROUP” PROFILES

Fig.6-27 combines three types of inter-related activities which are: “Active citizen record”, “workgroup Profile” and Participant profile” formation. The figure also summarizes the intricacies of such inter-relations. Formation of “active Citizen Record” is an activity performed by two agents, the PPC and the active citizen through a flow of data and actions presented as follows:

- enters problem to the system (digital PPC). By “citizen”
- If citizen record not found , then enter citizen data and create “Active citizen record”. By “Central data bank”
- If found, apply one of the following conditions:
 - 1- if number of active citizens reporting problem not enough to form workgroup, then save problem in “Complaints archive”. By “central data bank”.
 - 2- if number of active citizens reporting problem is enough to form workgroup, then assign “Facilitator, LPC, and NGO representatives. By PPC -form “workgroup record”. By “central data base”.
 - 3- If problem has a workgroup, then PPC invites the active citizen to join the workgroup. By “PPC”.
 - if reply is refusal, then save record under “Active Citizen”. By central Data Bank.
 - if reply is acceptance, then send Participation manual to “active citizen”. By PPC, then create “Participant Record “. By “central data bank” .

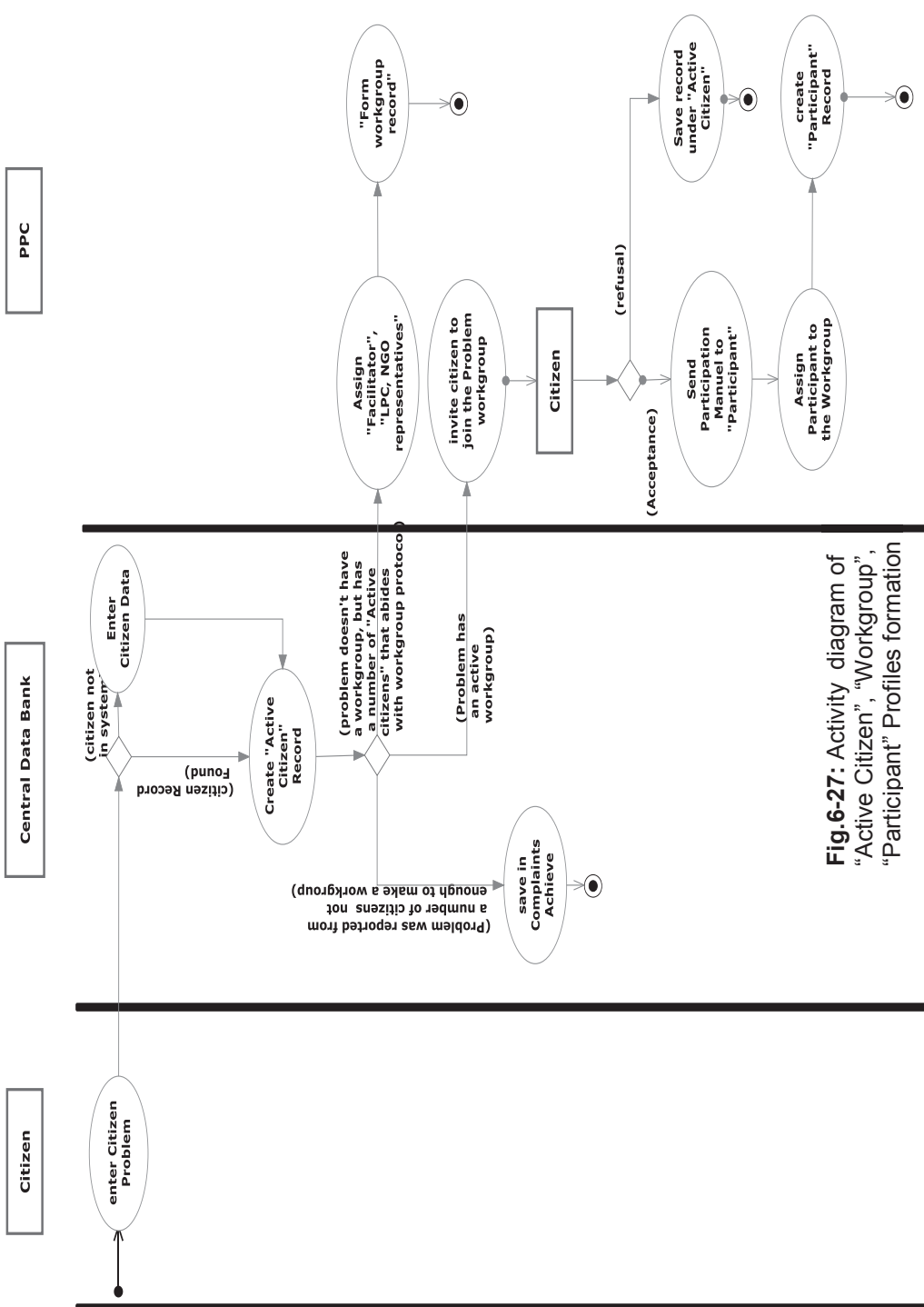


Fig.6-27: Activity diagram of "Active Citizen", "Workgroup", "Participant" Profiles formation

6.5.2 ACTIVITY OF "PROBLEM PROFILE" FORMATION

Figure 6-28 summarizes the intricacies of agents activity in forming "Problem Profile" as well as their inter-relations.

Formation of "Problem Profile" is an activity performed by three agents, "Facilitator", "Participant" and "Workgroup" through a flow of data and actions presented as follows:

- 1- Form workflow diagram./chart. By "Facilitator"
- 2- Send participants obligatory tasks and the optional ones. By "Facilitator"
- 3- Choose from the optional tasks. By "Participant".
- 4- Enter data about problem⁵ . By "Participant".
- 5- Check data entered by "participant" with "data entry protocol", and apply one of the following conditions: by "Central data base"
 - a) If data abides with the "data entry protocol", send data to the rest of the workgroup members, by "Central data base"
 - b) If data does not abide with "data entry protocol", return data back to the participant with the refusal specifications. by "Central data base".
- 6- checks workflow achievements and check sufficiency, trust relevance comprehensibility of data collected, By "Facilitator"
- 7- Send data collected to "Participants" for approval. By "Facilitator", and apply one of the following:
 - a) If "Participants" approved⁶, then start data analysis and repeat from step 4, to step7 the above steps. By "Workgroup".
 - b) If "Participants" disapproved, identify cause of disapproval
 - If reason is irrelevance or/and insufficiency, then back to step4.
 - If reason is incomprehensibility, lack of transparency and trust, then back to step 6.
- 8- Form "Problem Profile". By "Workgroup".

⁵ format according to the channels of communication they had already chosen and which is saved in every participant's profile).

⁶data collected is approved by more than 50% of "Participants",

6.5.3 ACTIVITY OF "SOLUTION PROFILE" FORMATION

Figure 6-29 summarizes the intricacies of agents activity in forming "Solution Profile" as well as their inter-relations.

Formation of "Solution Profile" is an activity performed by three agents, "Facilitator", "Participant" and "Workgroup" through a flow of data and actions presented as follows:

- 1- Create workflow diagram and send to participants. By "Facilitator"
 - 2- Enter proposed evaluation parameters. By "Participant". Apply the following:
 - If data entered abides with "data entry protocol", accept data and send to other participants. By "Central data base".
 - If data enter does not abide to "Data Entry Protocol", send back to participant with refusal causes. By "Central Data Base".
 - 3- Settle on evaluation parameter. By "Workgroup".
 - 4- Match the possible solutions from the "Problem solution data bank"⁷ and send it to participants. By "Central data base".
 - 5- Propose alternatives and send it to the workgroup. By "Participant". Apply the following:
 - If data entered abides with "data entry protocol", accept data and send to other participants. By "Central data base".
 - If data enter does not abide to "Data Entry Protocol", send back to participant with refusal causes. By "Central Data Base".
 - 6- Evaluate proposed alternatives according to parameters. By "Workgroup".
 - 7- Send evaluation to participants for voting. By "Workgroup". And apply the following:
 - If participants did not approve, then repeat step 2 to 7.
- If participants approved, form "Solution Profile". By "Workgroup"

⁷according to genetic engineering technology-see chapter 3 for more details

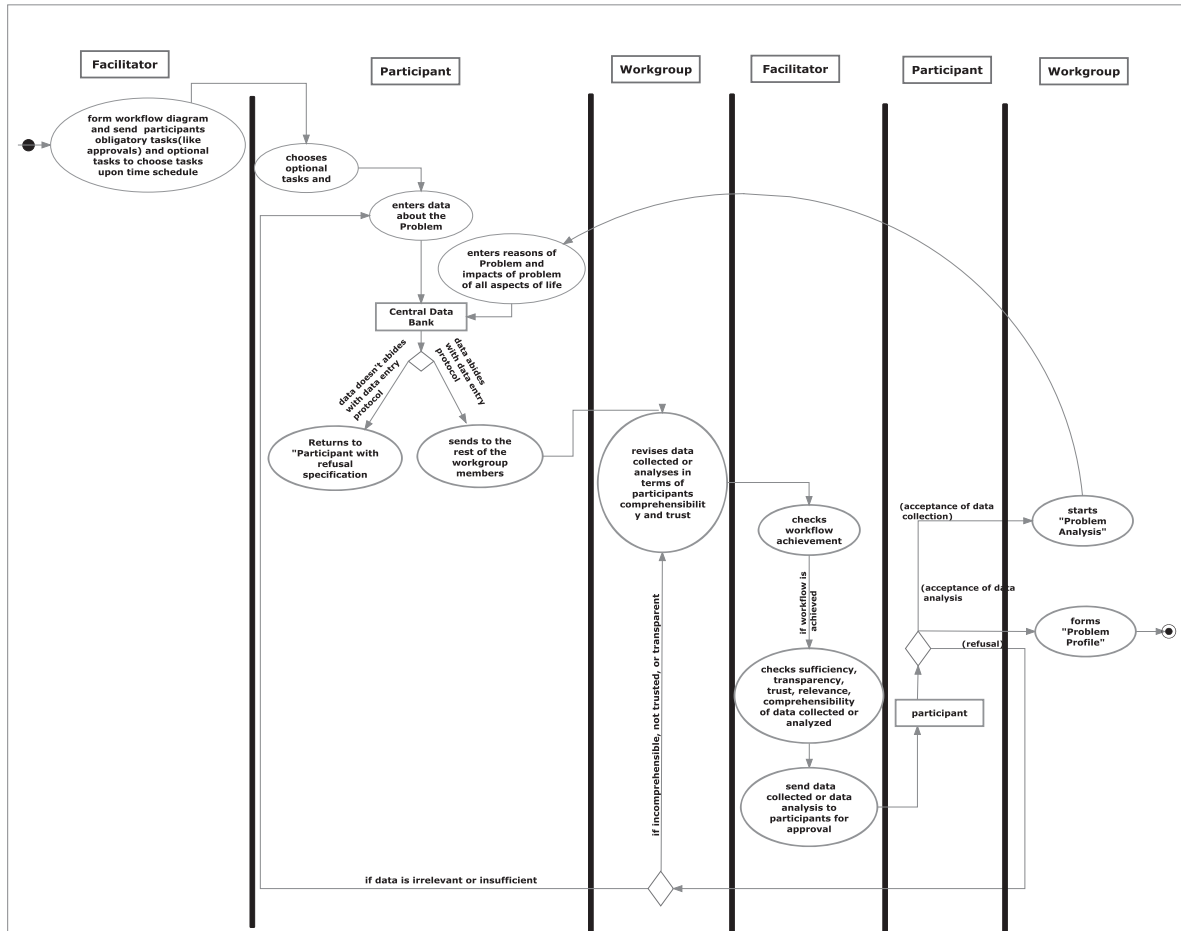


fig.6-28: activity diagram of "Problem" formation
 source: resercher construction

6.5.4 ACTIVITY OF MONITORING AND EVALUATION OF "PROJECT"

Figure 6-30 summarizes the intricacies of agents activity in monitoring and evaluating a "project" as well as their inter-relations in doing so.

Monitoring and evaluation of a "Project is an activity performed by three agents, "Consultant", "PPC" and "Workgroup" through a flow of data and actions presented as follows:

- 1- the consultant settles on the TOR and the Project approval.
- 2- if the workgroup doesn't approve, the consultant redesigns the project and the TOR, if the "Workgroup" approves, then,
- 3- the "PPC" settles on the donor, and the payment terms and instalments, then settles on the implementation team and project staff and signs the contract with the excutor.
- 4- The "Workgroup" forms monitoring parameters and checks implementation achievements acoording to parameters and time schedule seteled on.
- 5- If implementation doesn't abide with the schedual and/or plan, then the "PPC" corrects the failure of implementation through financial and implementation staff, if implementation abides with the schedule and plan, then
- 6- The "Workgroup" tests "Target citizens" satisfation. If "Target citizens" are satisfied, then the "Workgroup" monitors the "Project" regularly to check its efficiency and also regularly repeat the satisfaction test. If "Target Citizens" are not satisfied, then the "Workgroup" should start the activity of "Problem" formation over again.

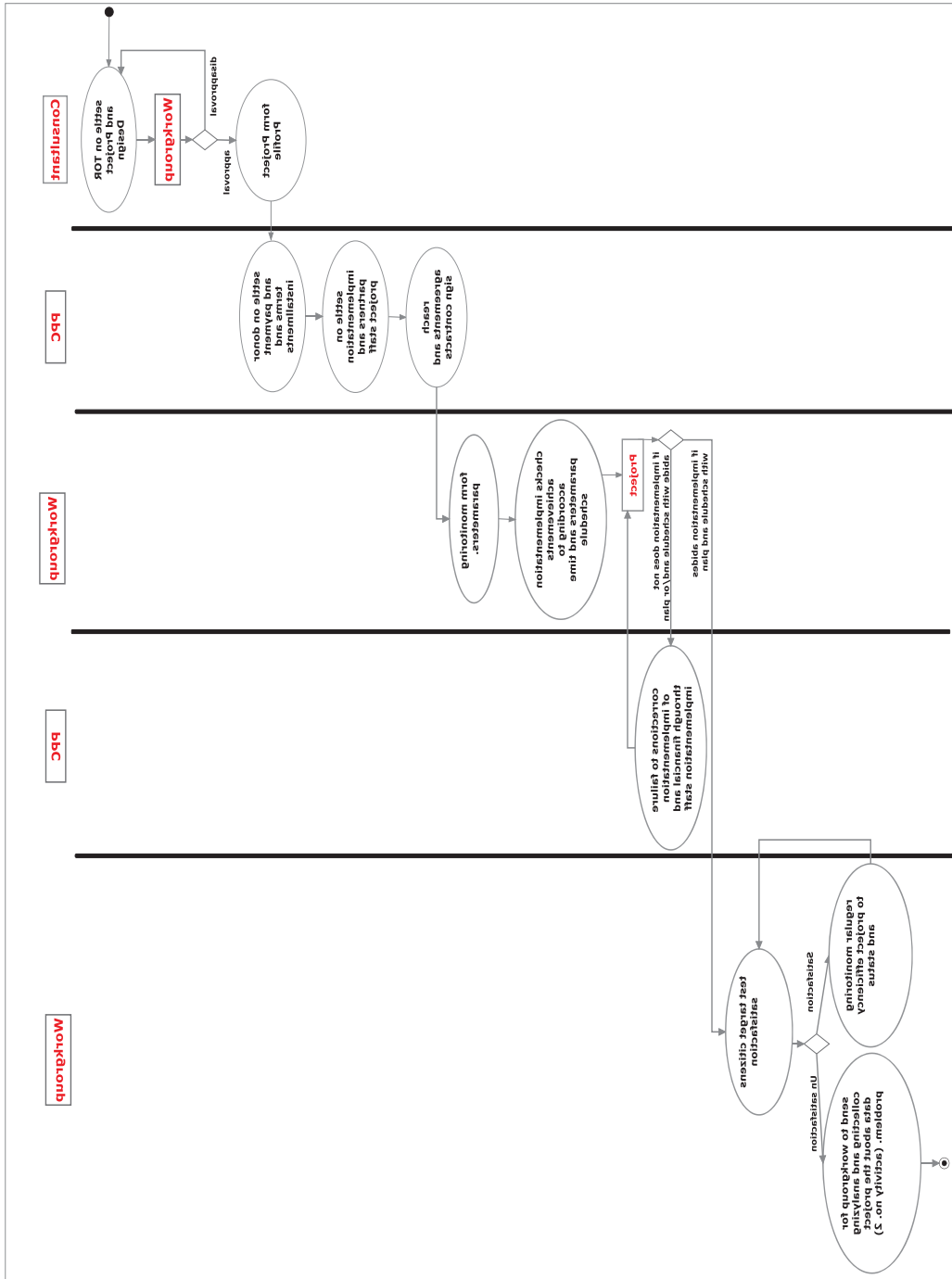


fig.6-30: activity diagram of Monitoring and Evaluation of "Project"
 source: resercher construction

6.6 COLLABORATION AMONG AGENTS AND SEQUENCE OF THEIR ACTIVITIES

Collaboration diagrams represent interactions between objects as a series of sequenced messages. They represent a combination of information taken from class, sequence, and use case diagrams describing both the static structure and dynamic behavior of a system.

The collaboration diagram which shows how all the agents of the PPP model work together to perform the functions of the model. The collaboration diagram in fig. 6-31 illustrates all the functions done collaboratively in a sequential form of messages between the agents of the model following the dewy numbering system.

Functions are listed as follows:

- 1: create active citizen Record
- 2: create workgroup
- 3: create Participant Record
- 4: form Problem Profile
- 5: form Solution Profile

As shown in the diagram, each of these functions is broken down into several messages travelling between agents.

Bundles of messages indicate the overall interaction between each pair of agents. Such representation shows that PPP is inherently a process of messages exchange, which in turn emphasizes the informational aspect adopted by the research.

The sequence diagram reveals several details about the agents activities. It shows the activity loops of problem and solution formation and also shows how the communication center links the physical part of the model with the digital one, and links all participants of the workgroup with the illiterate and unwired participants.

The sequence and time reference in the formation of both problem and solution profiles are crucial, where there are some activities that have to be repeated in a cyclic way, and doesn't get to the other activity except under some conditions. The sequence and conditions of activities concerning problem and solution formation are both illustrated in sequence diagram fig.6-32.

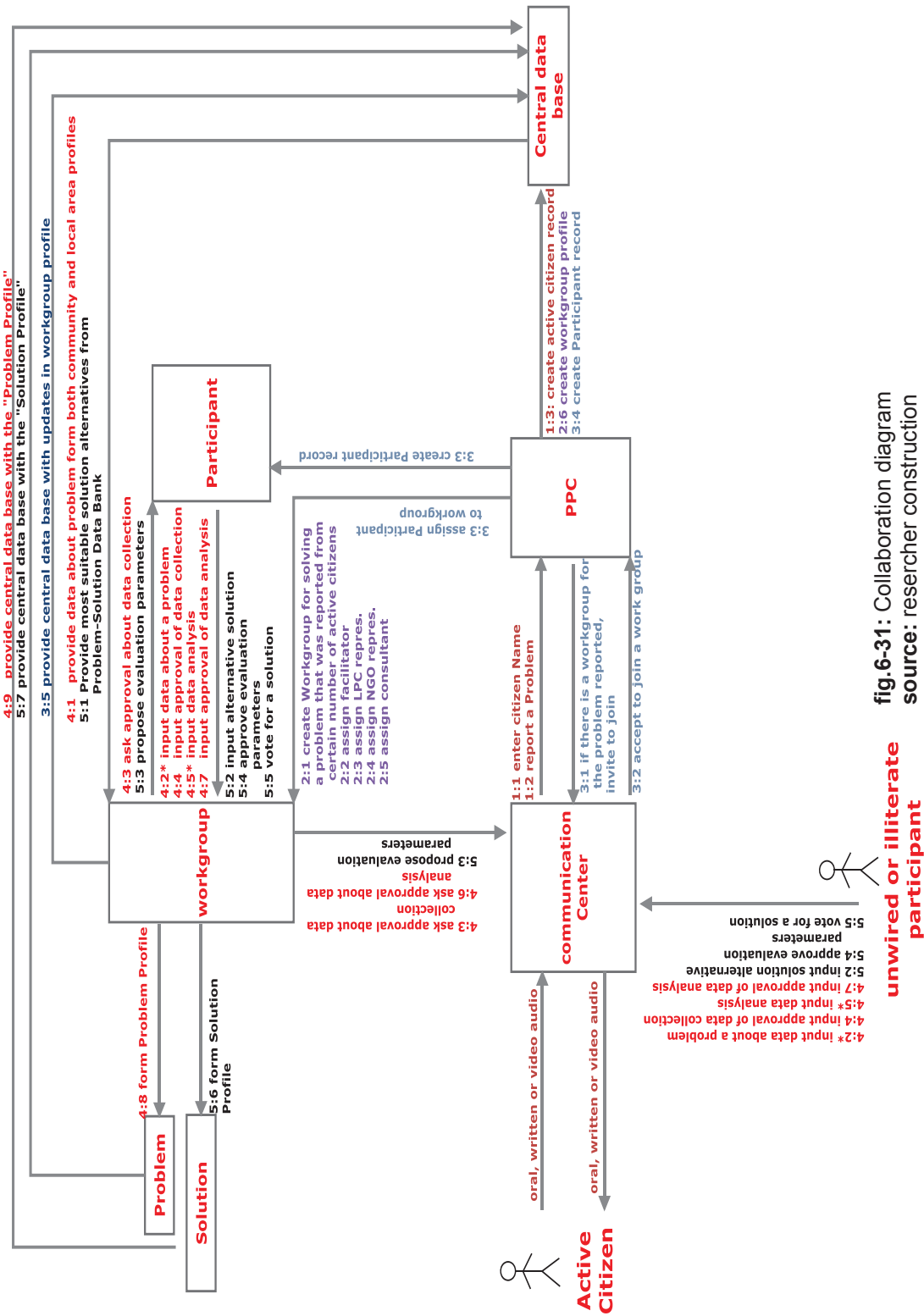


fig.6-31: Collaboration diagram source: researcher construction

unwired or illiterate participant

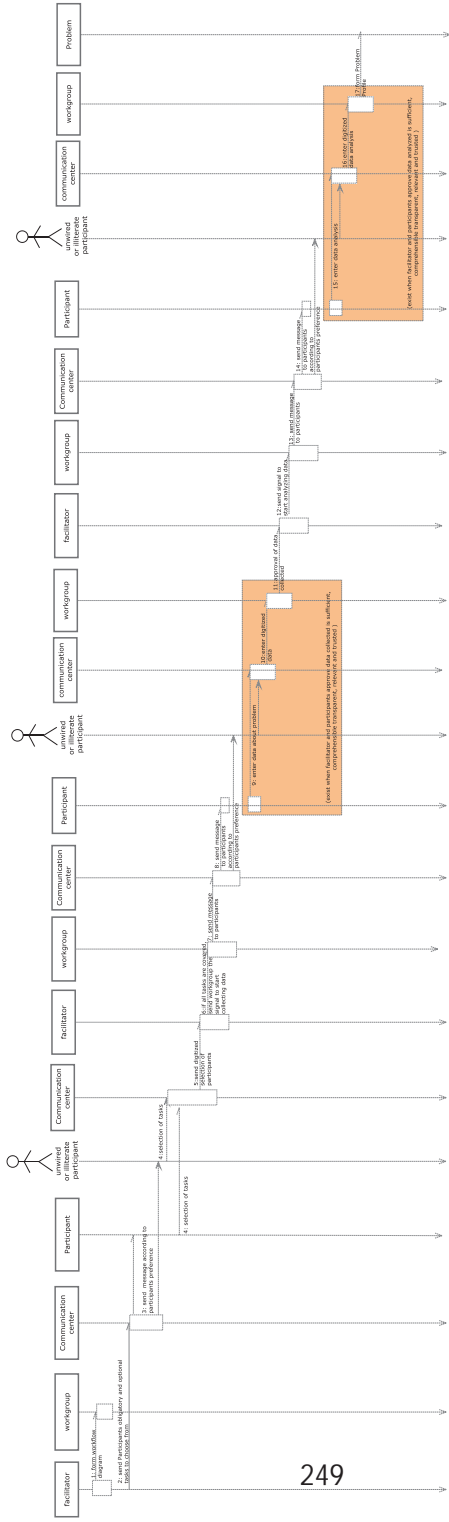


fig.6-32: sequence diagram of the formation of both problem and solution profiles showing the role of the communication center to reach all kinds of participants even the illiterate and the unwired
source: researcher construction

6.7 PPP MODEL DEPLOYMENT

Deployment diagrams depict the physical entities in a system *Visa* via the digital ones. Such delineation conforms to MAM which incorporates both physical and digital entities. For our PPP modeling, characterized by intensive communication and high collaboration, this duality ought to be highlighted. This is the purpose behind using the deployment diagram.

Through this dual typology the model combines both advantages of the digital component and the physical component. The former provides the advantages of being fast, convenient, asynchronous, complex, error minimizer. The latter provides the advantages of being close to people, manifests existence and effectiveness, convenient to illiterates and unwired.

The two parts of the deployment diagram in figure 6-33, are interfaced via a layer including programming and digitization facilities.

The physical part of the model comprises physical entities and the way they are inter-connections. For instance: an “active citizen” is connected with the “PPC” with postal communications.

The digital part of the model comprises digital entities and the way they are inter-connections. For instance: an “Active Citizen’s PC” is connected with the “PPC Server” through the Internet.

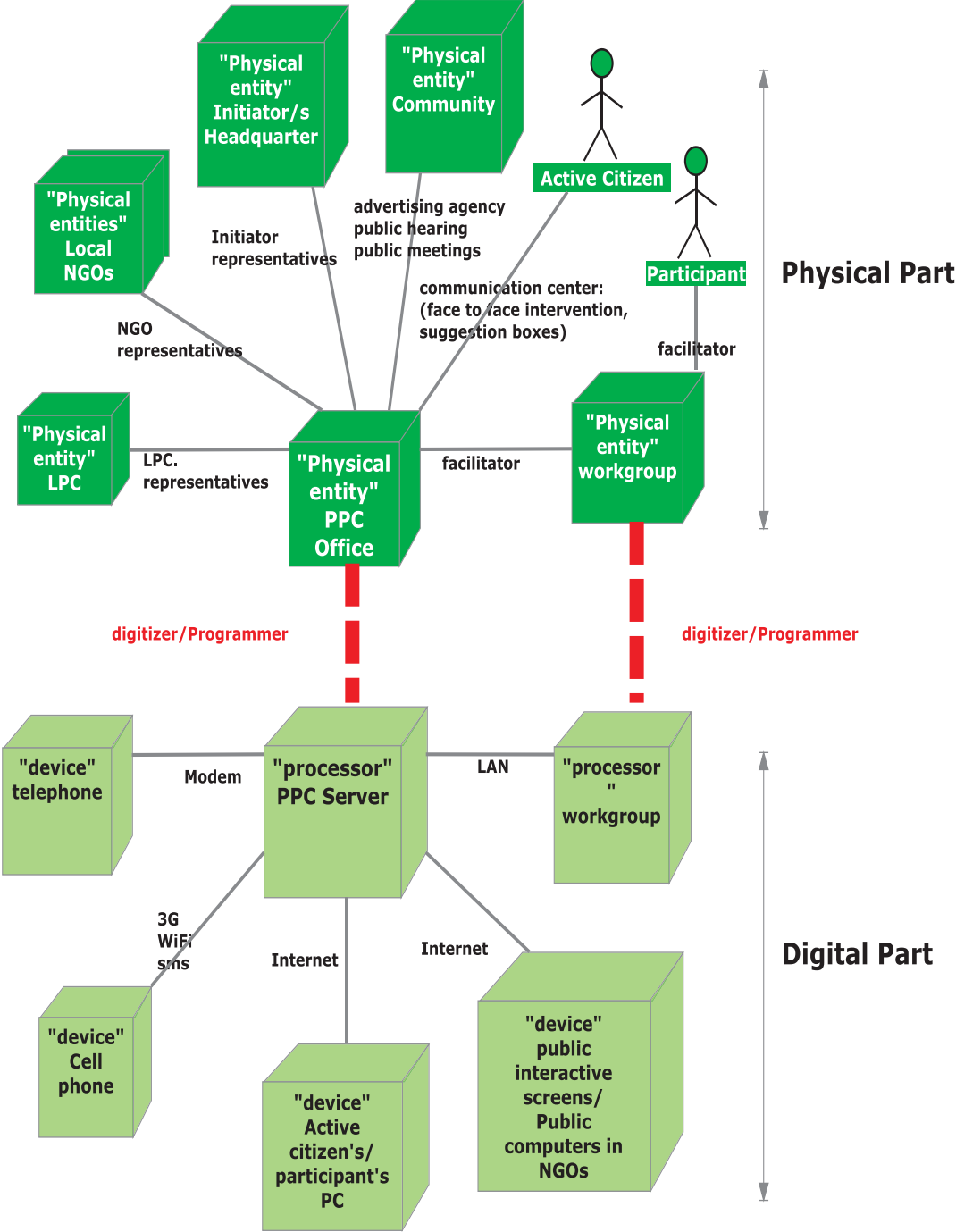


Fig.6-33: Deployment diagram of the P.P.P. model
 source: reseracher construction

6.8 INTEGRATING THE MULTIDISCIPLINARY PPP

Planning, informational and social aspects of PPP have been covered almost individually in previous chapters.

In this section, these aspects will be represented in an integrated fashion.

The Overall integration will be achieved through two main steps:

Step one ; integrating social and informational aspects of PPP.

Social aspects have spatial and temporal dimensions. Mapping these two basic social dimensions to various ICT types and channels is presented in Time/Space Groupware Matrix shown in fig 6-34.

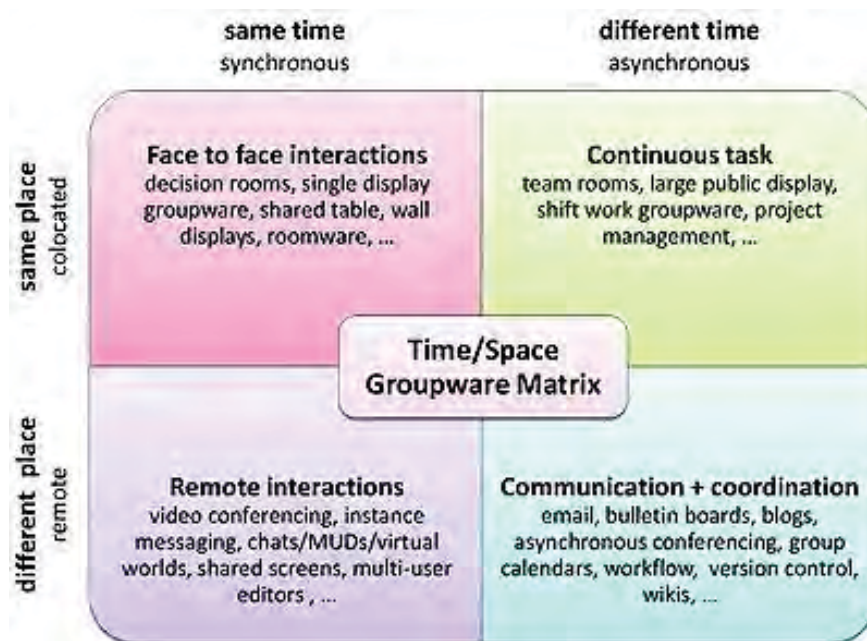


fig. 6-34: Time/space Groupware matrix
source: wikipedia, 2010

The matrix provides choice space wide enough to enables us to assign the appropriate channel and type to adapt to various social states.

The two case studies of applying PP in MN and Beltan have shown clearly that lack of such adaptability has lead to the exclusion of a significant social groups in general and illiterate group in particiular.

the given matrix is by no means exhaustive . The four cells of the matrix could be updated by additional communication channels. For instance, remote asynchronous communication type could be enriched by TV and radio communication channels.

Step two: integrating the whole aspects of PPP; Planning, social and informational aspects

The planning aspect is represented in terms of an inclusive list of planning functions covering different PP steps.

The social aspect is represented in terms of nodes (agents)

The informational aspect is broken down into three categories ; message type, communication type and channel.

Matrix 6-1 maps planning, informational social aspects together. The matrix is organized in the following sequence; planning, social, and informational. Such sequence assigns the driving role to the planning aspect, while presenting the informational one as set of facilities and tools available to social nodes to perform the planning functions.

Matrix 6-1 : PPP integration matrix				
Source: researcher				
Planning Aspect	Social aspect	Informational aspect		
Functions	Nodes or agents involved	Message type	Communication Type	Communication channel
1-Raise awareness	1-1 PPC to Community	1-1 advertisement campaign for PPC and its activities.	1-1 Remote interaction (differed time-different place)	1-1 T.V -Radio -Newspapers -flyers magazines
2-Form participant	2-1 "Active Citizen" to "PPC"	2-1 verbal, image, written or graphical representation of a problem	2-1 All time-space groupware matrix	2-1 letter, Note e-mail, phone call, face to face intervention, sms message, oral message through interaction screens
	2-2 "PPC" to "participant"	2-2 Participation form	2-2 All time-space groupware matrix	2-2 letter, e-mail, on-line web based, face to face if participant is illiterate
3-Form "reactive work groups"	3-1 "P.P.C" to "Participants"	3-1 Manuel about P.P.C. activities and PPP guide	3-1 Remote interaction	3-1 Flyer of PPP Manuel with multi metadata and formats according to participant's level of education, sent through mail or e-mail or delivered by hand.
	3-2 "facilitator" to "participant"	3-2 introducing "workgroup" members	3-2 remote interaction	3-2 according to participants preference
	3-3 "Community and Local Area Profile" to "Participant"	3-3 available information about problem	3-3 All time-space groupware matrix	3-3 according to participant's preference and education level.
4-Form pro-active workgroups	4-1 "PPC" to targeted citizen	4-1 Manuel about PPC activities and PPP guide As well as an Invitation to fundamental program	4-1 remote or face to face interaction according to threats and programs.	4-1 Flyer of PPP Manuel and program details with multi metadata and formats to suit target citizen level of education, sent through mail or e-mail or delivered by hand.

5-Data collection	<p>5-1 "Community and Local Area profiles" to "participant" 5-2 "Participant" to "workgroup" 5-3 "Advisor" to "workgroup"</p>	<p>5-1 multi format data about problem of workgroup 5-2 multi format data about problem of workgroup 5-3 feeding the workgroup with information (with different metadata) about the problem from his experience in general and his local experience in specific.</p>	<p>5-1 Remote interaction (differed time-different place) 5-2 different time-different place 5-3 remote synchronous or asynchronous groupware</p>	<p>5-1 depends on participant preference and level of education 5-2 depends on participant's preference and task. (citizens Questionnaire/recorded interviews- videos-images-documents) 5-3 web-based interaction</p>
6- Approving data about problem	6-1-"participant" to "workgroup"	6-1 approving sufficiency, transparency, trust, usefulness, comprehension and updates about "Problem"	6-1 same time – same place Face to face intervention in Or same time - different place in remote interaction	6-1 Decision rooms, shared tables for face to face interaction, or Video conferencing, sms through mobile phones. For remote interaction
7- Digitizing data approved and forming class "Problem"	7-1 "Facilitator" to "problem" 7-2 "Participant" to "Problem"	7-1 and 7-2 Transferring all physical formats (questionnaires, images, videos, arguments) into digital formats with all meta data as well.	7-1 remote interaction 7-2 remote interaction	7-1 web-based interaction 7-2 web-based interaction
8- Updating "community and local area Profile"	8-1 "PPC" to "Community and Local Area Profile" 8-2 "Problem" to "Community and Local Area Profile"	8-1 digital information about community and local area according to time between updates 8-2 all data about problem fed into the community and local area profile, updating any old data, in coherence with existing data, and with same standardization and ontology.	8-1 Remote interaction 8-2 Remote interaction	8-1 web-based interaction. 8-2 web-based interaction.

9-Data analysis	9-1(decision support system D.S.S.) to "Problem" 9-2-"Participant" to "participant" 9-3-"Participant" to "workgroup" 9-4 "Advisor" to "Workgroup" 9-5-"Workgroup" to "participant"	9-1 automatic analysis of "Problem" by artificial intelligence (DSS) 9-2, 9-3, 9-4and 9-5 Exchanging information about reasons and various impacts of the "Problem"	9-1 digital internal interaction 9-2 remote synchronous or asynchronous groupware	9-1 web-based interaction 9-2, 9-3 according to participant preference 9-4 web-based interaction 9-5 according to participant preference
10-Approving Problem consensus(analysis)		Same as (6)		
11- Digitizing approved Problem analysis		Same as (7)		
12-Update " Community Profile" and "Local Area Profile"		Same as (8)		
13- Proposing Solution alternatives	13-1- "Participants" to "workgroup" 13-2 "Problem-Solution data bank" to "participant"	13-1 integrated solution covering all aspects of "problem" 13-2 Solutions borrowed from similar problems in similar community and/or local area profile.	13-1, 13-2 remote synchronous or asynchronous interaction	13-1 13-2 According to participants preference
14- Solution evaluation parameters	14-1-"Participant" to "participant" 14-2-"participant" to "workgroup" 14-3-"Workgroup" to "participant"	14-1, 14-2, 14-3, Building a consensus over the evaluation parameters. Specifying parameters and their weighs	14-1, 14-2, 14-3 Remote asynchronous interaction	14-1, 14-2, 14-3 According to "Participant" preference
15- Evaluating alternatives	15-1- "Participant" to "workgroup"	15-1 each "Participant" evaluates each "alternative" according to evaluation parameters and their weights.	15-1 remote asynchronous evaluation	15-1 According to each participant's preference.
16-Voting for a solution	16-1-"Participant" to "workgroup"	16-1-after evaluation, facilitator should present the evaluation results on Participant's for final vote. "Participant" should vote, either "approve" or "disapprove"	16-1 Remote asynchronous voting	16-1 According to each participant's preference.

17-Public hearing	17-1-"Workgroup" to "community" 17-2-"Community" to "workgroup"	17-1 Problem solution presentation 17-2- Public vote either "Approve" or "Disapprove"	17-1-Synchronous Face to face 17-2-asynchronous co-located (same place) continuous task.	17-1- large town hall, public library, local school playground. 17-2- public vote glass boxes
18-Project identification and formulation	18-1- "PPC" to "Consultant" 18-2- "PPC" to "donor"	18-1- settling on the TOR and project design 18-2- Settle on donor and on payment terms and installations	18-1- remote asynchronous 18-2- face to face	18-1- web-based 18-2-documented meeting
19-Implementation	19-1- "PPC" to "Donor" 19-2- "PPC" to "implementation partners and staff"	19-1- settling on "implementation partners and project staff". 19-2- finalizing agreements and signing contracts	19-1 web-based intervention 19-2 face to face	19-1 advertising the mona2ssa on newspapers 19-2 publicity of agreement through local newspapers, T.V, or radio channels
Monitoring	20-1- "PPC" to "Donor" 20-2- "PPC" to "implementing partners and project staff" 20-3 "PPC" to "Project"	20-1- feedback implementation achievements according to time schedule. 20-2-Through implementation; to make sure project is being implemented according to agreements and design. Also to solve problems facing implementation 20-3 regular monitoring to "Project" status and monitoring parameters.	20-1 remote asynchronous 20-2 face to face monitoring, 20-3 varies according to nature of "Project"	20-1 web-based interaction 20-2 on-site interaction 20-3 varies according to nature of "Project"
Evaluation	21-1- "Participants" to "workgroup" 21-2-"community" to "PPC". 21-3 "PPC" to "Project"	21-1-After completion to compare results with project targets and "Problem" status. 21-2-test public satisfaction 21-3 regular evaluation of "Project" and "Solution" impacts on "Problem" and environments	21-1- remote asynchronous 21-2 remote asynchronous 21-3 varies according to nature of "Project"	21-1 according to "Participants" preference 21-2 public questionnaire distributed by "Participants" and digitized by "facilitator and some "Participants". 21-3 varies according to nature of "Project"

Introduction

This chapter presents three major points. The first covers the main theoretical contributions to knowledge that this research achieved. The second reflects on various aspects and parts of the current research. The third recommends some further research topics which would prove fruitful and worth exploring.

7.1 Theoretical Reflections

The current research manages to blend reality with future anticipations. This is confirmed through its initiation by a real problem and an extended hypothesis. The research sought a paradigm shift in dealing with this blend. The aim of this section is to synthesize this blend.

Research hypothesis

- 1- Although high level of participation is one of the PP principles, yet it has been ignored in PP applicability for its acquaintance with complexity. When complexity problems are handled, high level of participation will contribute greatly to the success of PP.
- 2- Time of participation for each participant has never been mentioned before, though it is a crucial factor affecting commitment, adaptability and effectiveness of the process.
- 3- Outcome of PP has mostly been concerned with quantifiable measures (like number of projects performed), though qualitative measures are far more important and sustainable.

Multidisciplinary Aspects

Complexity of PPP has never been confronted systematically and in a multidisciplinary fashion. The disciplined study of the problem has unveiled a myriad of challenges which ought to be considered both methodologically and practically. Despite these challenges, successful applicability of PPP is becoming more feasible thanks to advanced ICT.

Biologic bottom-up Paradigm

The biological paradigm has proven useful in the way ICT could be integrated within the PPP framework. ICT has to be organically integrated within the PPP process through Object Orientation and Agent Based technology which untangled complex PPP in a visual form of exchanged messages and set of inter-relations which has been expressed.

-Most approaches of PP recognized the importance of the first PP principle which says “hand over the stick” i.e. local people have full control over the planning process. However such principle has been a lip service so far (can't be expressed by real actions on the ground). Proposed PPP model has considered seriously the realization of this vital principle. This needs reorientation of PP. Thanks to its explanatory nature, the proposed PPP model could serve as an effective learning tool to achieve this reorientation.

Multi Agent Modeling MAM

MAM has proven to be an effective approach to untangle PPP complexity (information, social and planning complexities), thanks to its high decompositional capability (with the basis of artificial intelligence interpretation of Marvin Minsky) and its powerful means to surmount the collaboration network among agents. Supported by a graphical facility such as UML, MAM provided high degree of visualization and conceptual transparency.

7.2 Reflections on the Current Research

-Desired outcomes of PPP especially with regard to community self-organization could hardly be achieved without the effective use of ICT. Thanks to new trends of ICT, as found in the spread of social networking, there are increasing success opportunities for PPP. A recent evidence to support this claim is the outstanding success of using social networking to advocate masses to participate in the 25th of January revolution in Egypt. (even though there are a lot of negative impacts of the revolution on the economic and social stability of the country)

-PPP is more needed for under developed environments. This is due to higher complexity levels caused by severe social exclusion factors (poverty, illiteracy and unemployment). The presented PPP model was complexity focused, which renders it more adaptable to such environments.

-Needless to say, higher participation implies higher organizational overheads. However, the gained benefits surpass the additional costs.

More participation means higher probability of PPP success. This is due to the following reasons:

- It results in higher public acceptance.
- it provides a favorable environment for collective intelligence to emerge.
- It enhances sustainability through self-sufficiency and less dependency on donor and organizer to finance and organize PPP.
- It ensures wider coverage of community problems.

-Cost effectiveness of previous PP case studies is extremely questionable. It is the author's strong conviction that adopting PPP model will yield better results with lower costs provided that uninterrupted supervision from the initiator is maintained on the long term.

-Due to its novelty, PPP needs local regional and global cooperation to exchange experiences among different levels of involvements.

-The collaboration between many entities and synergetic team work within each entity components are great challenges. As to the model specifications, there are multi synergetic¹ challenges that could affect the success of the PPP model;

¹ Synergetics is the system of holistic thinking which R. Buckminster Fuller introduced and began to formulate. Synergetics explore inter-relationships in the facts of experience and the process of thinking. Synergetics endeavors to identify and understand the methods that Nature actually uses in coordinating Universe (both physically and metaphysically). Synergetics provides a method and a philosophy for problem-solving and design and therefore has applications in all areas of human endeavor. (SNEC), 2010.

-To synergize the local NNGs internally means that N.G.O.s need an internal committee to study the collaboration between those N.G.Os to mutually use their resources, (human, currency, lands, computers, etc) to help each other to enhance their efficiency in providing services to the community.

-To synergize the LPCs in each Governorate to provide mutual benefits in many fields like services, products, transportation, information, etc.

-Synergizing members of workgroups in each PPC to exchange local experience, resources, and participants.

-presented workflow in research is a guide which needs more research to various kinds of workflow modeling that could be used to manage collaboration of participants tasks through various steps of PP. (see appendix I).

7.3 Recommendations for Further Research

The research benefited greatly from the biological analogy, complexity science and cybernetics which was supported in research context by the GST (Bertalanffy, 1977). GST prefers to build wholes, even if they are complex and not fully covered instead of individual parts which might be lost in more holistic entities.

The following points have shown some promising and interesting preliminary findings in the present study.

1-Investing current participatory spirit

Investigating how to utilize the current high participation potential created by the 25th January revolution to channel it to the PPP domain. Being Facebook based, the said participation is more hospitable to PPP oriented applications.

2-Interface design

Design of flexible interfaces has to be developed to make social networking more capable to cross barriers of age gender and education.

3- Social and Planning Local Records

Expanding community profile exemplified in the present research to cover more social and economic factors affecting success of PPP. Hopefully the recommended research could yield reliable estimation of the different thresholds which invoke different fundamental programs.

4- Fundamental Programs

More serious study of implementing provocative actions to implement fundamental programs such as those related to life threatening cases. (Dowequa's catastrophe is a clear example. See appendix J). This is a rare case of relying on a top-down approach with the bottom up oriented PPP, which demands external allocation of resources and reducing the resistance of the threatened community to accept proposed solutions.

5- PPP Ontology

Building a specialized ontology for PPP incorporating different concepts and semantic inter-relations among them. The metadata specifications included in the present research could serve as a nucleus triggering the development of the proposed ontology.

6- Investing Social Networking Technologies

Using Social networking such as Facebook as a problem solving vehicle for PPP problematic. Presenting PPP in an integrated fashion done by the present research (see table Matrix 6), could serve as a mechanism to formalize social networking as a starting point. Facebook provides user

friendly tools to organize workgroups, defining participants profiles, and immediate propagation and collecting attitudinal feedback (example; like, dislike).

Dynamic Network Analysis DNA could be implemented using the face book as means to highlight pivotal agents through which inter-connectivity between sub networks is achieved. (See appendix K for an example of the capabilities of the DNA in analyzing the Middle East Iranian social network).

7-Simulation of PPP

MAM has been used by the current research for an explanatory purpose. Using it for simulation purpose is extremely useful for different levels of decision making. A useful guidance in this regard could be found in the work of Dr. Ferdinando Semboloni who presented a multi agent participatory simulation known as City Dev.

8- Wiki-Participatory Planning

Building a Problem solution data bank adopting a – Wiki- approach to invite contributions and search mechanisms.

9- Longitudinal Research

As this kind of research could be categorized under the cross-sectional type, were it discussed multidisciplinary aspects affecting Participatory Planning, further longitudinal research could contribute to PPP knowledge in each of those three aspects.

Appendix (A): Paradigm and Paradigm shift

A paradigm is how we interpret an issue, what we see in it as a problem, methods we use to handle it. According to Kuhn, the founder of the term is that a paradigm is what members of a scientific community, and they alone, share. (Wikipedia encyclopedia 2011)

Paradigms were rarely applied to the analysis of organizations. Now, organizations regularly discuss and strategize about shifting paradigms. The idea that organizations can shift their paradigms is extremely powerful. It means that individuals and groups can define how they view and interpret the world around them, and begin organizing behavior around new way of thinking that can significantly transform organizations. (Marcia Drew Hohn, 1998).

Paradigm change/shift is stepping out of the box for a more fundamental rethinking of premises. Paradigm shifts promote transformation. If such transformation is to occur, the beliefs that control behaviors must undergo change. (Marcia Drew Hohn, 1998).

Also a Paradigm shift is, according to Thomas Kuhn a change in the basic assumptions, or paradigms, within the ruling theory of science.

Since the 1960s, the term has also been used in numerous non-scientific contexts to describe a profound change in a fundamental model or perception of events, even though Kuhn himself restricted the use of the term to the hard sciences. (Wikipedia encyclopedia 2011)

Appendix (B): PRA Common Principles

Despite the different ways in which various approaches are used in PRA, there are important common principles uniting most of them. Pretty, J.N, et al -1994- on behalf of the IIED summarized them as follows:

A defined methodology and systematic learning process: the focus is on cumulative learning by all the participants .

Multiple perspectives: a central objective is to seek diversity where different individuals and groups make different evaluations of situations, which lead to different actions.

Group inquiry process: all involve the recognition that the complexity of the world will only be revealed through group inquiry. This implies three possible mixes of investigators, namely those from different disciplines, from different sectors and from outsiders (professionals) and insiders (local people).

Context specific: the approaches are flexible enough to be adapted to suit each new set of conditions and actors, and so there are multiple variants

Facilitating experts and stakeholders: The role of the *expert* is helping people in their situation to carry out their own study and so achieve something. These *facilitating experts* may well come from the community, and thus be stakeholders themselves.

Leading to sustained action: The debate and or analysis both defines changes which would bring about improvement and seeks to motivate people to take action to implement the defined changes. This action includes local institution building or strengthening, so increasing the capacity of people to initiate action on their own.

Appendix (C): UML Diagrams

1-Use Case Diagrams

a- **Use case diagrams** model the functionality of system using actors and use cases. Use cases are services or functions provided by the model to its users.

Basic Use Case Diagram Symbols and Notations

b- System

A system's boundaries are drawn using a rectangle that contains use cases. Actors are placed outside the system's boundaries.

c- Use Case

Use cases are drawn using ovals. Use cases are named with verbs that represent the model's functions, for example "print" is a verb that represents the function of printing.

d- Actors

Actors are the users of the model. When one sub-model is the actor of another sub-model, label the actor sub-model with the actor stereotype.

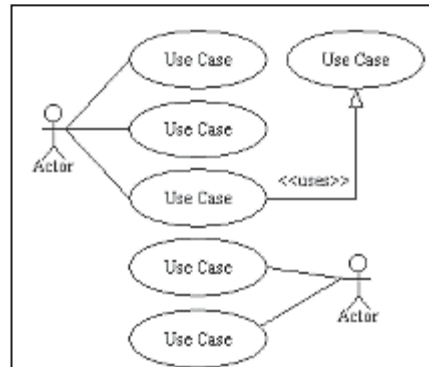


Fig. (a): use case diagram

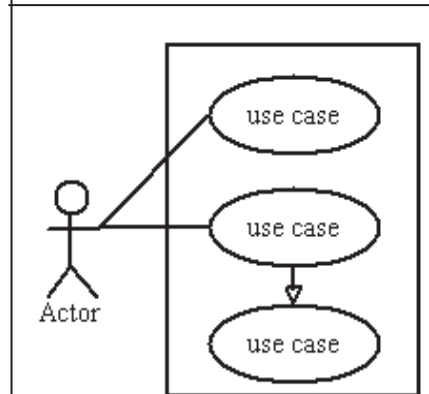


Fig. (b): system's boundaries

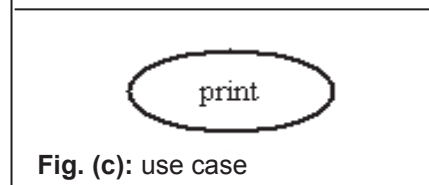


Fig. (c): use case

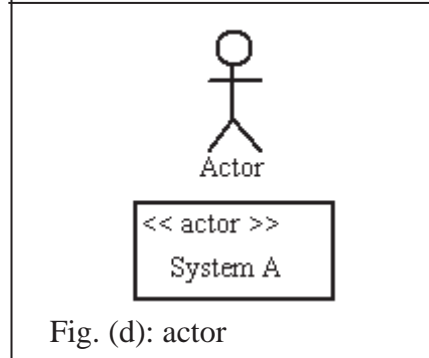


Fig. (d): actor

Fig. C-1: use case symbols
Source: Smart Draw tutorials

e- Relationships

The relationship between an actor and a use case is illustrated with a simple line. For relationships among use cases, labeled arrows "includes", "uses" or "extends" are used. An "includes" relationship indicates that one use case includes many other use cases. A "uses" relationship indicates that one use case is needed by another in order to perform a task. An "extends" relationship indicates alternative options under a certain use case.

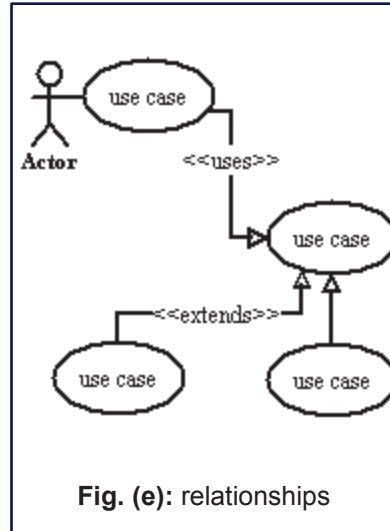


Fig. (e): relationships

Fig. C-1: continued use case symbols
Source: Smart Draw tutorials

2- Class Diagrams

a- **Class diagrams** are the backbone of almost every object oriented UML method. They describe the static structure of a system.

Basic Class Diagram Symbols and Notations

Classes represent an abstraction of entities with common characteristics. Associations represent the relationships between classes. Classes are illustrated with rectangles divided into compartments. The name of the class is placed in the first partition, the attributes re listed in the second partition, and operations are written into the third.

b- Active Class

Active classes initiate and control the flow of activity, while passive classes store data and serve other classes. Illustrate active classes with a thicker border.

c- Visibility

Visibility markers are used to signify who can access the information contained within a class. Private visibility hides information from anything outside the class partition. Public visibility allows all other classes to view the marked information. Protected visibility allows child classes to access information they inherited from a parent class.

d- Associations

Association is a static vector with a direction. It represents static relationships between classes. Association names are placed above, on, or below the association line. A filled arrow indicates the direction of the relationship. Roles are placed near the end of an association. Roles represent the way the two classes see each other.

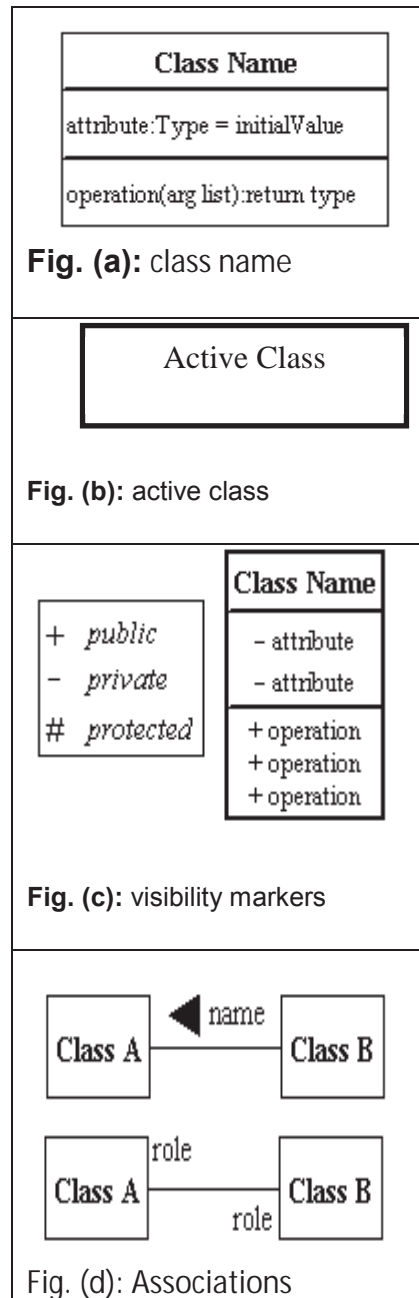


Fig. C- 2: class diagram symbols
Source: Smart Draw Tutorials

Association roles could be drawn using simple lines labeled with stereotypes.

Composition and Aggregation

Composition is a special type of aggregation that denotes a strong ownership between Class A, the whole, and Class B, its part. Composition is illustrated with a filled diamond. a hollow diamond represents a simple aggregation relationship, in which the "whole" class plays a more important role than the "part" class, but the two classes are not dependent on each other. The diamond end in both a composition and aggregation relationship points toward the "whole" class or the aggregate. This relation could be homogenous, like the book and its chapters, or heterogenous, like the car and its parts.

e- Multiplicity (Cardinality)

Multiplicity notations are placed near the ends of an association. These symbols indicate the number of instances of one class linked to one instance of the other class. For example, the class" environment workgroup" could solve one or many problems, but each problem is solved by only one workgroup.

f- Constraint

A constraint is a condition. Constraints are placed inside curly braces {}. For example the relation between the class "workgroup" and the class "problem" has a constraint, which is that the workgroup can not handle more than 3 problems at a time. There are other many examples, like the budget not exceeding a certain limit, etc.....this is a simple constraint. Constraints could be a little complicated, for example, if the problem is environmental, then the workgroup could only handle one, if other problem types , then not more than three.

g- Generalization

Generalization is another name for inheritance. It refers to a relationship between two classes where one class is a specialized version of another.

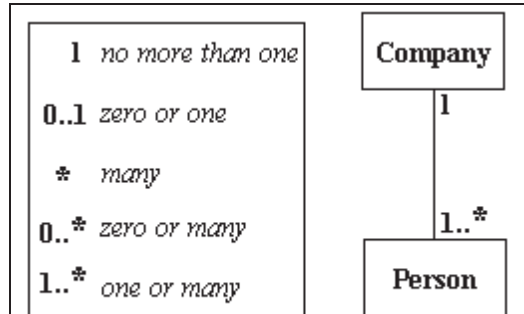


Fig. (e) : Multiplicity

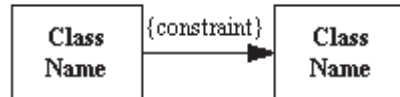


Fig. (f): Simple constrain

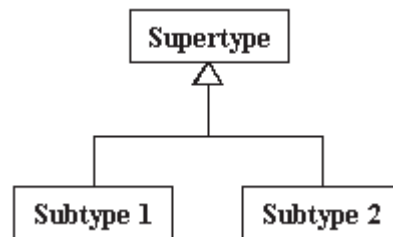


Fig. (g): generalization

Fig. C-2 : continued class diagram symbols

Source: Smart Draw Tutorials

The difference between inheritance and aggregation can be confusing. If an aggregation relationship exists, the aggregate (the whole) can access only the "public" functions of the part class. On the other hand, inheritance allows the inheriting class to access both the "public" and "protected" functions of the superclass. For example, suppose a mother super class is "Environment Problems", having attributes like location, number of affected citizens and total area affected. This superclass has three children subclasses "Water problems", "Air problems" and "Soil Problems". Each child subclass inherits the same attributes of the mother, in addition to new attributes of its own. For example, the child "water problems" inherits all the above attributes of the mother " Environment Problem" in addition to other special attributes of its own, like; pollutant types, chemical or natural, percent of pollutants, fresh water or salty , oceans or seas, rivers or lakes, stagnant or runny etc.....

Basic Object Diagram Symbols and Notations

a- Object names

Each object is represented as a rectangle, which contains the name of the object and its class underlined and separated by a colon.

b- Object attributes

As with classes, object attributes could be listed in a separate compartment. However, unlike classes, object attributes must have values assigned to them. Active Objects that control action flow are called active objects. These objects are illustrated with a thicker border.

c- Multiplicity

Multiple objects can be illustrated as one symbol if the attributes of the individual objects are not important.

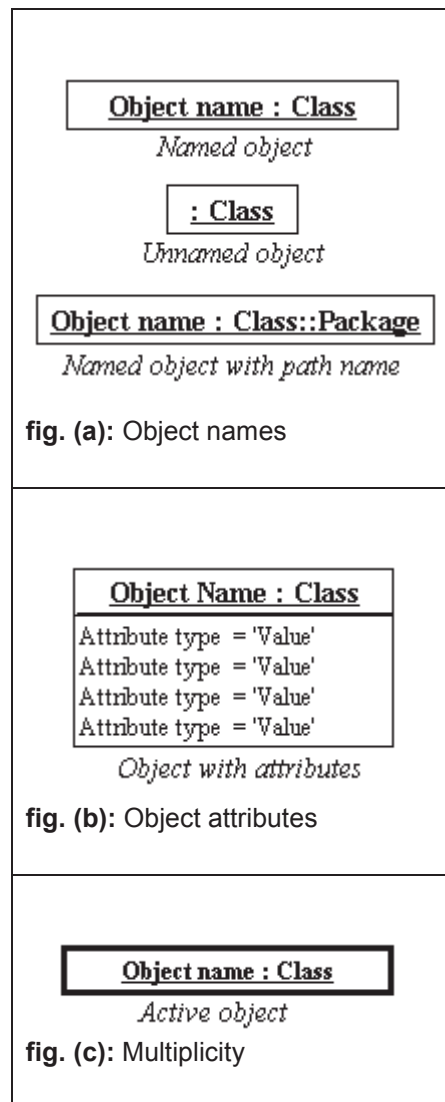


Fig. C-3 : object diagram symbols and notations

Source: Smart Draw Tutorials

d- Links

Links are instances of associations. a link could be drawn using the lines used in class diagrams.

e- Self-linked

Objects that fulfill more than one role can be self-linked. For example, if Mohamed, an administrative assistant in a workgroup, also fulfilled the role of a marketing assistant in the same workgroup, and the two positions are linked, Mohamad's instance of the two classes will be self-linked.

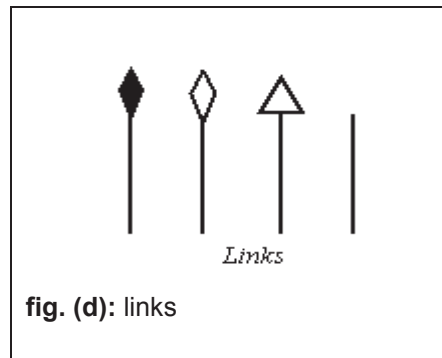


fig. (d): links

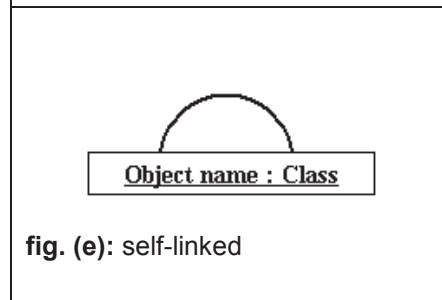


fig. (e): self-linked

Fig. C-3: continued object diagram symbols and notations
Source: Smart Draw Tutorials

3-Package Diagrams

a- Package diagrams are a subset of class diagrams, but developers sometimes treat them as a separate technique. Package diagrams organize elements of a system into related groups to minimize dependencies between packages.

Basic Package Diagram Symbols and Notations

A tabbed folder is used to illustrate packages. The name of the package is written on the tab or inside the folder. Similar to classes, the attributes of a package could be listed.

b- Visibility

Visibility markers signify who can access the information contained within a package. Private visibility means that the attribute or the operation is not accessible to anything outside the package. Public visibility allows an attribute or an operation to be viewed by other packages. Protected visibility makes an attribute or operation visible to packages that inherit it only.

c- Dependency

Dependency defines a relationship in which changes to one package will affect another package. Importing is a type of dependency that grants one package access to the contents of another package

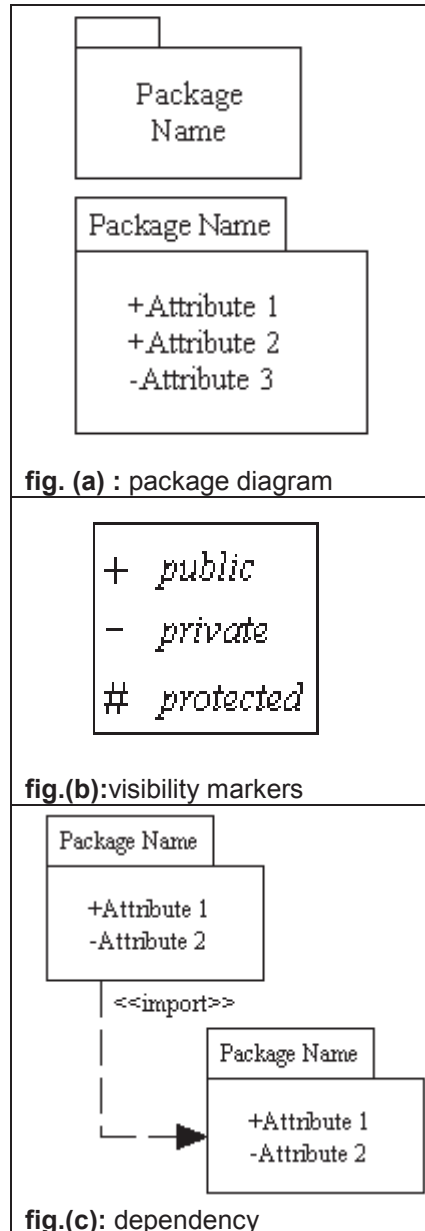


Fig. C-4 : package diagram symbols and notations
Source: Smart Draw Tutorials

4-Activity Diagrams

a- Activity diagrams illustrate the dynamic nature of a system by modeling the flow of control from activity to activity. An activity represents an operation on some class in the system that results in a change in the state of the system. Typically, activity diagrams are used to model workflow or business processes and internal operation. Because an activity diagram is a special kind of statechart diagram, it uses some of the same modeling conventions.

Basic Activity Diagram Symbols and Notations

b- Action states

Action states represent the non-interruptible actions of objects.

c- Action Flow

Action flow arrows illustrate the relationships among action states.

d- Object flow

Object flow refers to the creation and modification of objects by activities. An object flow arrow from an action to an object means that the action creates or influences the object.

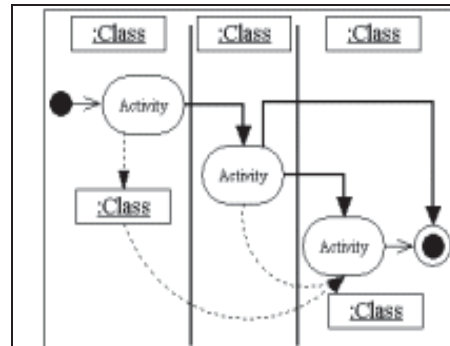


fig. (a): activity diagram



fig.(b):action state

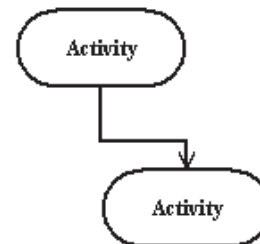
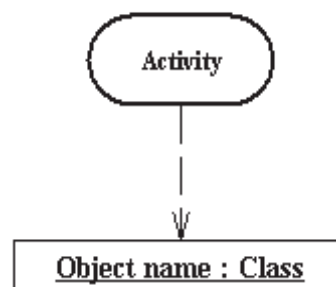


fig.(c):action flow



f.(d): object flow

Fig. C-5 : activity diagram symbols and notations

Source: Smart Draw Tutorials

An object flow arrow from an object to an action indicates that the action state uses the object.

e- Initial State

A filled circle followed by an arrow represents the initial action state.

f- Final State

An arrow pointing to a filled circle nested inside another circle represents the final action state.

g- Branching

A diamond represents a decision with alternate paths. The outgoing alternates should be labeled with a condition or guard expression.

h- Synchronization

A synchronization bar helps illustrate parallel transitions. Synchronization is also called forking and joining.

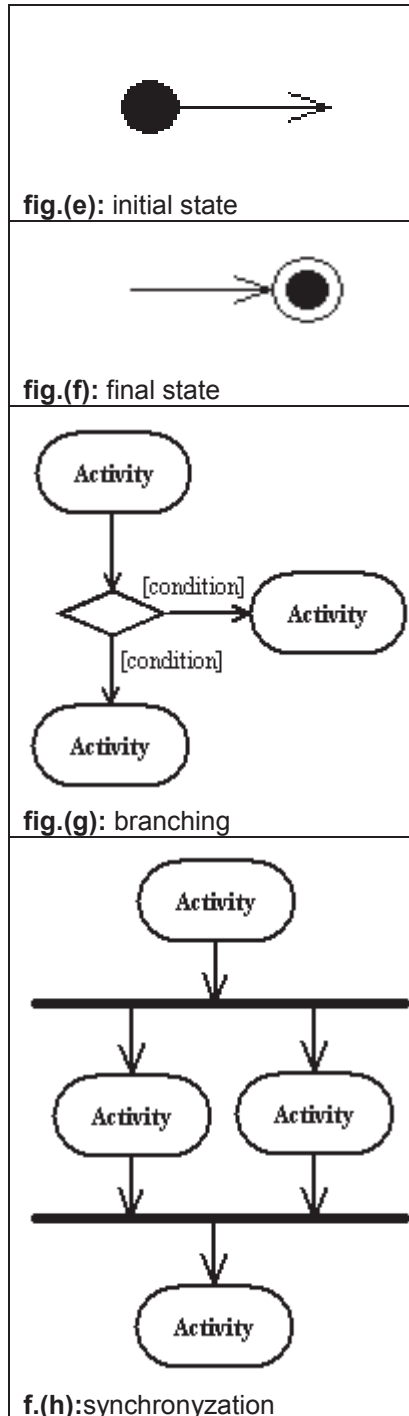


Fig. C-5: Continued activity diagram symbols and notations
Source: Smart Draw Tutorials

5-Statechart Diagram

A statechart diagram shows the behavior of classes in response to external stimuli. This diagram models the dynamic flow of control from state to state within a system.

Basic Statechart Diagram Symbols and Notations

a- States

States represent situations during the life of an object. You can easily illustrate a state by using a rectangle with rounded corners.

b- Transition

A solid arrow represents the path between different states of an object. Label the transition with the event that triggered it and the action that results from it.

c- Synchronization and Splitting of Control

A short heavy bar with two transitions entering it represents a synchronization of control. A short heavy bar with two transitions leaving it represents a splitting of control that creates multiple states.

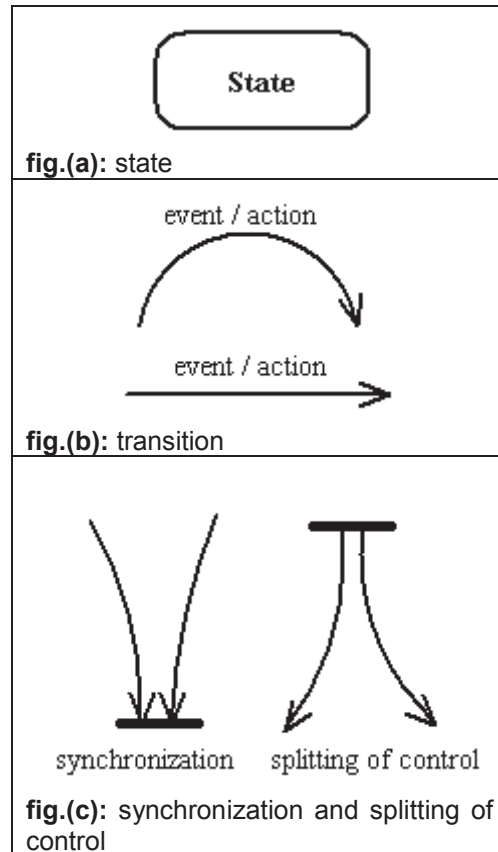


Fig. C-6: State chart diagram
Source: Smart Draw Tutorials

6-Sequence Diagrams

Sequence diagrams describe interactions among classes in terms of an exchange of messages over time.

Basic Sequence Diagram Symbols and Notations

a- Class roles

Class roles describe the way an object will behave in context. UML object symbol is used to illustrate class roles, but object attributes are not listed.

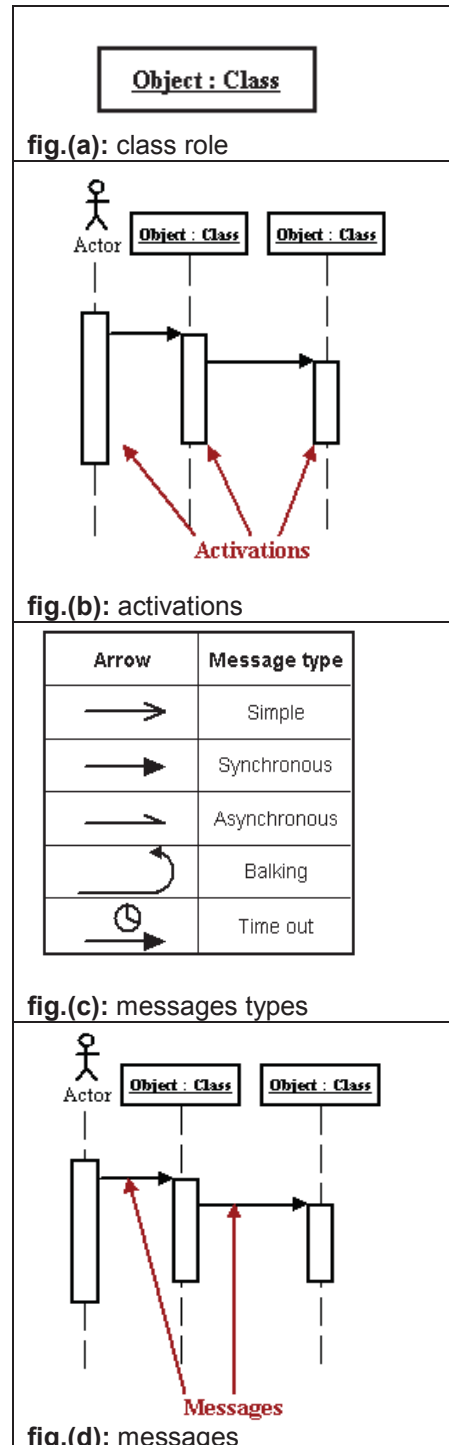
b- Activation

Activation boxes represent the time an object needs to complete a task.

c- Messages

Messages are arrows that represent communication between objects. Use half-arrowed lines to represent asynchronous messages. Asynchronous messages are sent from an object that will not wait for a response from the receiver before continuing its tasks.

Fig. C-7 : sequence diagram symbols and notations
Source: Smart Draw Tutorials



e- Lifelines: Life-lines are vertical dashed lines that indicate the object's presence over time.

g- Destroying Objects

Objects can be terminated early using an arrow labeled "<< destroy >>" that points to an X.

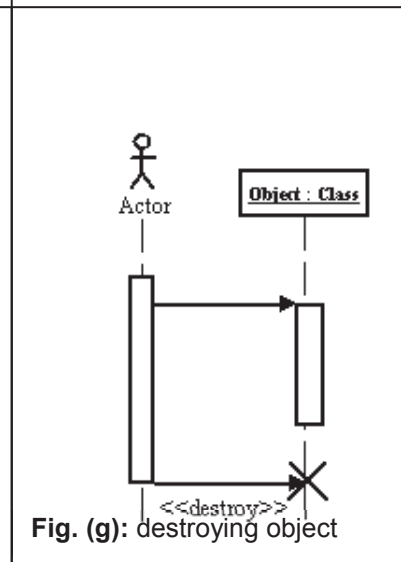
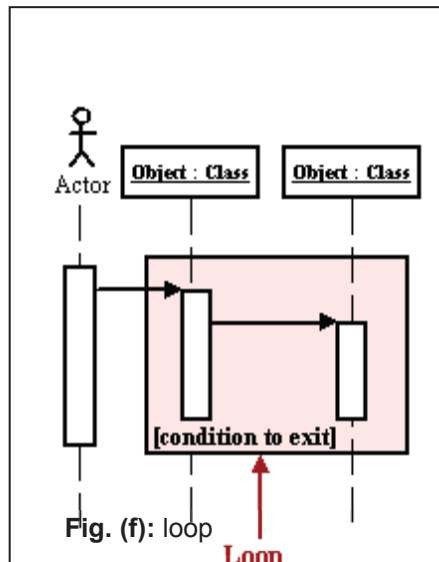
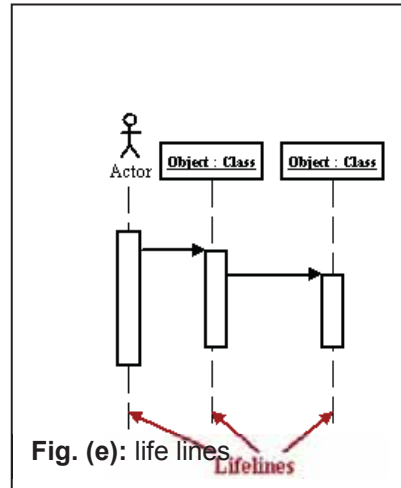


Fig.C-8 : continued sequence diagram symbols and notations
Source: Smart Draw Tutorials

f- Loops

A repetition or loop within a sequence diagram is depicted as a rectangle. Place the condition for exiting the loop at the bottom left corner in square brackets [].

7-Collaboration Diagrams

a- Collaboration diagrams represent interactions between objects as a series of sequenced messages. They represent a combination of information taken from class, sequence, and use case diagrams describing both the static structure and dynamic behavior of a system.

Basic Collaboration Diagram Symbols and Notations

b- Class roles

Class roles describe how objects behave. UML object symbol is used to illustrate class roles.

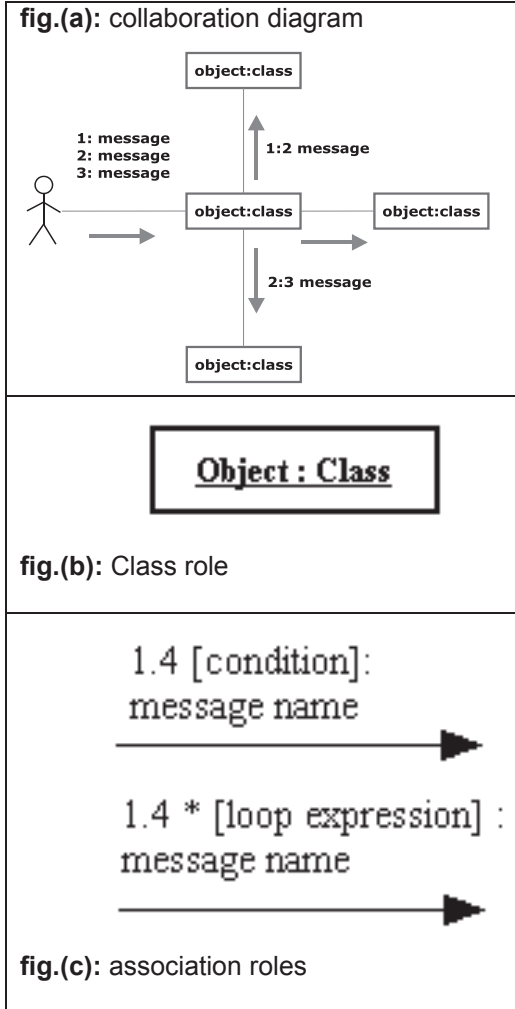


Fig. C-9: Collaboration diagram symbols and notations

Source: Smart Draw Tutorials

c- Messages

Unlike sequence diagrams, collaboration diagrams do not have an explicit way to denote time and instead number messages in order of execution. Sequence numbering can become nested using the Dewey decimal system. For example, nested messages under the first message are labeled 1.1, 1.2, 1.3, and so on. The condition for a message is usually placed in square brackets immediately following the sequence number. A * is used after the sequence number to indicate a loop.

8- Component Diagram

A component diagram describes the organization of the physical components in a system.

Basic Component Diagram Symbols and Notations

a- Component

A component is a physical building block of the system. It is represented as a rectangle with tabs.

b- Interface

An interface describes a group of operations used or created by components.

c- Dependencies

Dependencies are drawn among components using dashed arrows.

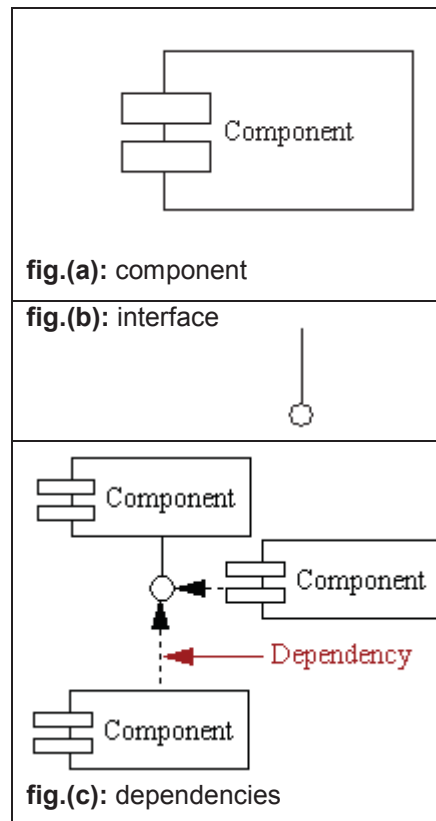


Fig. C-10 : Component diagram symbols and notations
Source: Smart Draw Tutorials

9- Deployment Diagram

Deployment diagrams depict the physical resources in a system including nodes, components, and connections.

Basic Deployment Diagram Symbols and Notations

a- Component

A node is a physical resource that executes code components.

b- Association

Association refers to a physical connection between nodes, such as Ethernet.

c- Components and Nodes

Place components inside the node that deploys them.

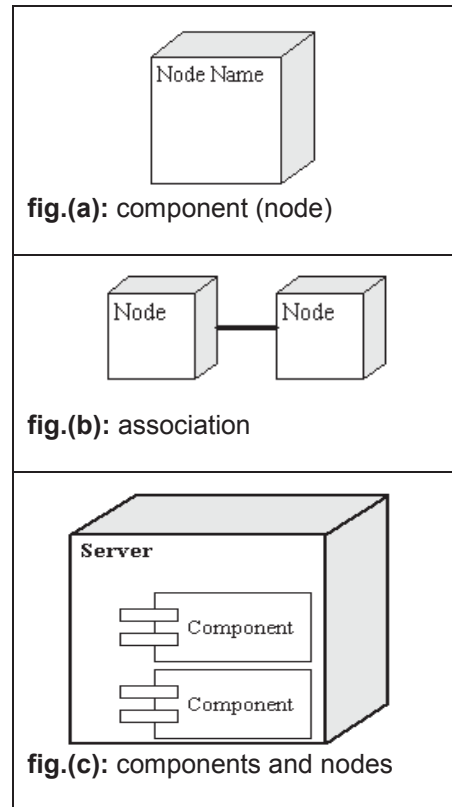


Fig. C-11: Deployment diagram symbols and notations
Source: Smart Draw Tutorials

Appendix (D): Research Questionnaire

This is the English format that was translated into the Arabic language and distributed among participants in both Beltan and MN.

The distributed questionnaire had a designed space for the required answers.

The questionnaire is composed of four sections.

-The first section is covering general information about the participant.

The other four sections are covering the success criteria of the PPP from three aspects each; Social Informational and Planning.

-the second section is covering questions about “Level of participation”

-the third section is covering questions about “Time of Participation”, first generally and then from the three previous aspects.

-the fourth section is covering questions about “Quality of Participation”.

Table D-1 : The English format of the Research Questionnaire

Source: researcher, 2009

<p>1- Background information</p> <p>a. sex of the participant: male female</p> <p>b. What is your current age? _____ Years.</p> <p>c. What is your current education level?</p> <p>d. What is your current occupation? _____ If unemployed please state for how long. _____ Years.</p> <p>e. How many free hours do you have per day? _____ hours.</p> <p>f. What is your average monthly income? (not obligatory) _____ L.E</p> <p>g. Did you take part in the P.P.P. that took place in your area?</p> <p>h. If not, could you choose why? (End of Questionnaire for those who didn't take part in the process).</p> <p><input type="checkbox"/> Didn't know about it.</p> <p><input type="checkbox"/> Didn't have enough time to participate.</p> <p><input type="checkbox"/> Don't believe it could be of any use, (please specify reasons)</p> <p><input type="checkbox"/> Not interested.</p> <p><input type="checkbox"/> Other reasons, (please specify)</p>

1. Level of participation																		
Social Aspect	<p>1-1 What do you think about the level of participation in the process? (Evaluating the level of participation)</p> <p><input type="checkbox"/> Low, because</p> <p><input type="checkbox"/> Average, because,</p> <p><input type="checkbox"/> High, because,</p> <p>1-2 how could you describe the role of the government in affecting the level of participation in the process? (motivation-roles)</p> <p><input type="checkbox"/> Positive, because</p> <p><input type="checkbox"/> Negative, because</p> <p><input type="checkbox"/> Neutral, because</p> <p>1-3 How could do describe the role of the NGOs in affecting the level of participation in the process?(motivation-roles)</p> <p><input type="checkbox"/> Positive, because</p> <p><input type="checkbox"/> Negative, because</p> <p><input type="checkbox"/> Neutral, because</p> <p>1-4 what do you think could be done to increase the level of participation?</p> <p>1-5 could you indicate a percentage to the transparency of the process? % Transparent.</p> <p>1-6 whom -from your opinion- did the process target? (Motivation-social scope)</p> <table border="0" style="width: 100%;"> <tr> <td><input type="checkbox"/> The poor only</td> <td><input type="checkbox"/> The educated only</td> </tr> <tr> <td><input type="checkbox"/> The rich only</td> <td><input type="checkbox"/> Some people</td> </tr> <tr> <td><input type="checkbox"/> The illiterate only</td> <td><input type="checkbox"/> Most people</td> </tr> <tr> <td></td> <td><input type="checkbox"/> All people</td> </tr> </table>	<input type="checkbox"/> The poor only	<input type="checkbox"/> The educated only	<input type="checkbox"/> The rich only	<input type="checkbox"/> Some people	<input type="checkbox"/> The illiterate only	<input type="checkbox"/> Most people		<input type="checkbox"/> All people									
	<input type="checkbox"/> The poor only	<input type="checkbox"/> The educated only																
	<input type="checkbox"/> The rich only	<input type="checkbox"/> Some people																
<input type="checkbox"/> The illiterate only	<input type="checkbox"/> Most people																	
	<input type="checkbox"/> All people																	
<p>1-7 How far do you think the process was successful in targeting the resident's problems? (motivation- social equivalence)</p> <p>1-8 Do you think the community in this area is homogenous or heterogeneous?(social cohesion)</p> <p>1-9 Here are some variables that could influence the level of participation in the process. What is your valuation of the relative importance of each of them? Give degree for each one between brackets from 0 to 10- where 0 represents the least in importance and 10 represents the most for importance- and a +ve or -ve beside those underlined to indicate if the influence is positive or negative.(social variables affecting level of participation collectively)</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Variables</th> <th style="text-align: left;">degree</th> </tr> </thead> <tbody> <tr> <td>*motivation</td> <td></td> </tr> <tr> <td>*trancparency</td> <td></td> </tr> <tr> <td>*socail cohesion</td> <td></td> </tr> <tr> <td>*Trust</td> <td></td> </tr> <tr> <td><u>*poverty</u></td> <td></td> </tr> <tr> <td><u>*education</u></td> <td></td> </tr> <tr> <td><u>*health</u></td> <td></td> </tr> <tr> <td><u>*employment</u></td> <td></td> </tr> </tbody> </table>	Variables	degree	*motivation		*trancparency		*socail cohesion		*Trust		<u>*poverty</u>		<u>*education</u>		<u>*health</u>		<u>*employment</u>	
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Informational Aspect	<p>1-10 how did you know about the P.P.P. taking place in your area?</p> <p>1-11 could you indicate a percentage to the awareness of the residents to the existence and importance of the process? % Knew it existed. % knew its important.</p> <p>1-11 Which of the following advertising means-if introduced- would help increase level of participation? Could you arrange them in ascending order according to their efficiency?(awareness)</p> <ul style="list-style-type: none"> <input type="checkbox"/> advertising through the internet, <input type="checkbox"/> introducing participation in school's curriculum, <input type="checkbox"/> distributing flyers, <input type="checkbox"/> issuing local magazine, <input type="checkbox"/> advertising in papers, <input type="checkbox"/> advertising on T.V, <input type="checkbox"/> advertising in radio <input type="checkbox"/> bill boards <input type="checkbox"/> other (please specify) <p>1-12 if public computer interactive screens were provided in schools, cafes and youth centers, here is a list of some user (public) interfaces that could be used to raise the level of participation, especially among the illiterate, youth, and children. Which in your own valuation would be the most appropriate. Give degree for each one between brackets from 0 to 10, where 0 represents the least in acceptance and 10 represents the most in acceptance.(interface)</p>		
	User interface	description	Degree
	Geographical interface	Allows people to interact with programs in more ways than typing, with images rather than text commands).	
	Direct Manipulation interface	Like resizing a graphical shape, such as a rectangle, by dragging its corners or edges with a mouse).	
	Metaphor interface	based on an activity, an object, or a combination of both. work with users' familiar knowledge to help them understand „the unfamiliar.“. example is the tree view representation of a file system, as in a file manager that helps a user to use it.	
Text user interface	it could output text, but accept other form of input in addition to or in place of typed command strings.		

	<p>Voice user interface</p>	<p>which accept input and provide output by generating voice prompts. The user input is made by pressing keys or buttons, or responding verbally to the interface.</p>	
	<p>Touch user interface</p>	<p>are graphical user interfaces using a touchscreen display as a combined input and output device. Used in many types of point of sale, industrial processes and machines, self-service machines etc</p>	
<p>Planning Aspect</p>	<p>1-13 how far you think previous computer public interface and mobile phones would be efficient in the following participatory steps</p> <ul style="list-style-type: none"> <input type="checkbox"/> Motivation <input type="checkbox"/> Data collection <input type="checkbox"/> Analysis of problems <input type="checkbox"/> Solution suggestions <input type="checkbox"/> Voting for best solutions <input type="checkbox"/> Monitoring and evaluation of the process <p>1-14 How far do you think the supplier (donor) has power in controlling the event? (Dependency) Dependent by %.</p> <p>1-15 From your previous experience how far do you think an outside training is required? (Dependency)</p> <p>1-16 How far so you think the participants depend on an outside moderator/leader to implement the process? (Dependency)</p> <p>1-16 Do you think it was an easy process that you could do without external help? (Ease of practice) <input type="checkbox"/> yes <input type="checkbox"/> No</p> <p>1-17 Do you think distance learning techniques could raise the level of participation? (Distance learning) <input type="checkbox"/> yes <input type="checkbox"/> No</p>		

2. Time of Participation													
<p>2-1-how long did the process take?</p> <p>2-2 How many hours did you participate in the process per week? Hours.</p> <p>2-3-Do you think the time of the participatory planning process: (evaluating time of the process)</p> <p><input type="checkbox"/> took longer than it should, because <input type="checkbox"/> took just the right time, because</p> <p style="padding-left: 100px;"><input type="checkbox"/> didn't take enough time, because</p>													
Social Aspect	<p>2-4-Were there any conflicts of interests from the participants and the stakeholder's side? <input type="checkbox"/> Yes <input type="checkbox"/> No If so, who had the dominant role in resolving them and how? (Conflicts of interest)</p> <p>2-5-How could you describe the role of the government in affecting the time of the process?</p> <p style="padding-left: 40px;"><input type="checkbox"/> Positive, because <input type="checkbox"/> Negative, because <input type="checkbox"/> Neutral, because</p> <p>2-6-Here is a list of some variables that could affect the time of the process. What is your evaluation of the relative influence of each one on the time of the process? Give degree for each one between brackets from 0 to 10, where 0 represents the least in importance and 10 represents the most for importance.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Variables</th> <th style="text-align: center;">degree</th> <th style="text-align: left;">how to be avoided</th> </tr> </thead> <tbody> <tr> <td>Centralization</td> <td></td> <td></td> </tr> <tr> <td>technophobia</td> <td></td> <td></td> </tr> <tr> <td>Participants Commitment</td> <td></td> <td></td> </tr> </tbody> </table> <p>2-7 Do you think participants were committed to the process? Why? (Commitment)</p> <p style="padding-left: 40px;"><input type="checkbox"/> Most were committed, because <input type="checkbox"/> Average commitment, because <input type="checkbox"/> Most were not committed, because</p> <p>2-8 What do you think could be done to speed up the process?</p> <p>2-9 -If technological means could speed up the P.P.P., for example using computers in various steps of the process. How do you think people in your area would react to technological means, if introduced? (Technophobia)</p> <p style="padding-left: 40px;"><input type="checkbox"/> With great enthusiasm, <input type="checkbox"/> moderate reaction <input type="checkbox"/> with great fear</p>	Variables	degree	how to be avoided	Centralization			technophobia			Participants Commitment		
Variables	degree	how to be avoided											
Centralization													
technophobia													
Participants Commitment													

Informational Aspect	<p>2-10 Did you take part in data collection about the area and its residents before starting the planning process?(cooperative information system)</p> <p>2-11 Here is list of some of the communication tools that could influence the speed of the process. Which in your opinion is more convenient to you, and once again to your society in general. Give degree for each one between brackets from 0 to 10, where 0 respresents the least in conveyeince and 10 represents the most for conveyent .(communication tools)</p> <p>Tools</p> <p style="text-align: center;">personal convenience public convenience</p> <ul style="list-style-type: none"> -Face to face interaction -public meeting -Post it note,(participation boxes for votes on any proposals or alternatives) -sequential and accumulative tasks -Tele-video-conference* -sms through mobile phones, -e-mail -web-based distribution <p>2-12 Which do you think is more efficient tool to help participants understand the process?(visualization tools)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Maps <input type="checkbox"/> 3d models <input type="checkbox"/> Computer models <input type="checkbox"/> Animated computer models <input type="checkbox"/> Cards <input type="checkbox"/> Pictures <input type="checkbox"/> Charts and diagrams <p>2-13 During the process, was there any presentation of solutions to similar problems from professionals or the organizing staff?(data bank of problems-solutions)</p>		
Planning Aspect	<p>2-14 Which do you think is a more practical and easily applicable way of learning the process?(learning process)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Learning on site by doing <input type="checkbox"/> Learning form similar examples <input type="checkbox"/> Learning in workshops with professionals <p>2-15 Where you involved in solving all problems of the community (environmental, social, economic and urban)? If not specify which kind.(specialization factor)</p> <p>2-16 Which of the following planning stages were you involved in: (planning tasks per person)</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <input type="checkbox"/> Data collection <input type="checkbox"/> Problem identification <input type="checkbox"/> Problem analysis <input type="checkbox"/> Designing solutions(alternatives) </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <input type="checkbox"/> Calculating costs <input type="checkbox"/> Putting strategies <input type="checkbox"/> Monitoring <input type="checkbox"/> Evaluation </td> </tr> </table>	<ul style="list-style-type: none"> <input type="checkbox"/> Data collection <input type="checkbox"/> Problem identification <input type="checkbox"/> Problem analysis <input type="checkbox"/> Designing solutions(alternatives) 	<ul style="list-style-type: none"> <input type="checkbox"/> Calculating costs <input type="checkbox"/> Putting strategies <input type="checkbox"/> Monitoring <input type="checkbox"/> Evaluation
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3.Outcome of Participation	
Social Aspect	<p>-1 Do you think the participatory planning process was: (process evaluation)</p> <p><input type="checkbox"/> A success, because</p> <p><input type="checkbox"/> A good trial, because</p> <p><input type="checkbox"/> A failure, because</p> <p>3-2 Did you know the value of the fund or budget of the process?(transparency)</p> <p>3-3 Do you think the budget or fund assigned for the process was enough to achieve its targets? (Resources)</p> <p>3-4 How much of the targets of the process were achieved?</p> <p>3-5 Was there any public vote (those who didn't take part in the process) on the problems, solutions, budgets, or any other step in the process? (Public acceptance)</p> <p>3-6 Do you have any local leaders in the area, trusted persons who contributed to the process? (Building leaders and raising capabilities)</p> <p>3-7 Did this process leave the community with any local leaders who could lead the process without external dependency? (Formation of public leaders)</p> <p>3-8 After the experience of the previous P.P.P., do you think participants are now organized and able to perform the process themselves? (Social organization)</p>
Informational Aspect	<p>3-9 Was there any recording of the participants arguments that lead to decisions?(worth trusted information system)</p> <p>3-10 Do you think recording argumentation would lead to more transparency and openness of the process? (argument documentation)</p> <p>3-11 Was there any kind of communication network between the participants through which they shared ideas and discussed problems?(community network during the process)</p> <p>3-12 After the organizing staff left the area, is there any communication between the participants?(community network after the process)</p> <p>3-13 While performing the process, how could you describe the data presented to you; (information system evaluation?)</p> <p><input type="checkbox"/> Old <input type="checkbox"/> useful <input type="checkbox"/> comprehensible <input type="checkbox"/> trusted <input type="checkbox"/> sufficient</p> <p><input type="checkbox"/> Updated <input type="checkbox"/> irrelevant <input type="checkbox"/> non-comprehensible <input type="checkbox"/> not-trusted</p> <p><input type="checkbox"/> Insufficient</p>

Planning Aspect	<p>3-14 How far do you think participants understood how to take part in the process? (Learning evaluation)</p> <p>3-15 How did you learn how to take part in the participatory planning process? (Learning techniques)</p> <p>3-16 Were there any workshops for raising the capabilities of the participants? Specify other training techniques if existed. (Training techniques)</p> <p>3-16 Now that the supplier or organizer has gone, are there any learning or training mechanisms available in the community? (Learning mechanism)</p> <p style="padding-left: 40px;">Workshops, Computer sites, Others, (please specify)</p> <p>3-18 Was there any participatory monitoring mechanisms for the implementation of the planned solutions? (Self-correction mechanism)</p> <p>3-19 were there any participatory evaluations (quantitative and qualitative) published or distributed? (Self-correction mechanism)</p> <p>3-20 Do you consider this experience as a project (with product targets) that ended, or a process that could be sustainable? (Sustainability)</p>
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Appendix (E): Executed projects according to various development fields in Case Studies.

Table E-1: Projects executed in different development fields

Source: LPC in Beltan, 2011, GTZ 2008.

Beltan	MN
As the projects were executed from Shorouk Program and "Emergency plan donations", almost all projects executed were infrastructure ones. No educational, environmental or economic projects were executed as shown below;	As resources were variant, and donations were given to specific fields (refer to resources above), there were projects executed in all fields of development, as shown below;
<u>Culture</u> Execution of a public library in El-Abadlla.	<u>Culture</u> Development of Culture Palace Renewing work includes a theater, cinema screen, library, and computer laboratory. Women Building execution
<u>Urban</u> -Adjustment of the limits of the Urban Premises to contain population until 2022, by adding 2.7 Fadden in Elsafina and by adding 3.44 Fadden. In El-Safa, in 2007 -Partial insulation of medium m voltage electric air lines penetrating village, where insulations were in the outlet of transformers only. -execution fo a post office building in Manshaa El Ammar, but not yet in service. -Insulation of electric lines in El-Safina in 2007/2008 -Development of potable water supplies in El-Gazawia -Covering drainage paths penetrating El-Gazawia, and 100 m only of "Farsees" drainage line in El-Safina -Building healthy sewage system partially in Zawyet Beltan -Continuous monitoring of water cleanliness and tanks hygiene in El-Abadlla and El-Safa	<u>Urban</u> -A Land titling Committee had been established for El-Masaken. People started claiming their right of ownership. -Water and sewage complete network upgrading projects were implemented in 5 "Sheiakhs" with total amount 44.494.961 L.E. -Some Road pavements in the 4 sheiakhat took place. -Renovation of El-Masaken entrance. -Fire station execution
<u>Educational</u> Nothing was done to enhance educational development in any of Beltan's villages	<u>Educational</u> -Teachers" Capacity Building Two trainings were conducted for both "art teachers" and "Scouts leaders". Besides on job training for Scouts leaders.

	<ul style="list-style-type: none"> -GIS For KIDs. Three days workshop in one of MN schools. Introducing GIS ,and its useful application to students -Development of 57 schools in 2005-2008
<p><u>Social</u></p> <ul style="list-style-type: none"> -Development of health unit in Beltan, and Zawyet Beltan in 2009 -Activation of social development programs in Manshaa El-Ammar in addition to the Initiation of a new NGO (AMMER), two new NGOs in EL-Gazawia -Development of youth center and sports fields in El-Abadlla 	<p><u>Social</u></p> <ul style="list-style-type: none"> -Capacity building for Local Administration through Computer and GIS courses for managers, and departments employees -Execution of a Social service building -Renewing the only youth center in El-Masaken The work includes football playground, 3 playgrounds, and renovate social building. Roof Plantation -Upgrading El-Gabarty Health center. Providing it with X-ray machine. -Prevention of Blindness Initiative. Through Local initiatives funds (LIF). The project included awareness campaigns and establishing Eye Clinic -A Training Program was conducted in order to activate role of NGOs in MN. -Through Local Initiatives Funds (LIF)¹, local NGOs implemented 7 projects with about 500.000 L.E. The projects <i>varies</i> from clinics, sewing units, scouts,...etc.. Each NGO is eligible for 100000 at maximum
<p><u>Economic</u></p> <p>Nothing was done to enhance economic development in any of Beltan's villages</p>	<p><u>Economic</u></p> <ul style="list-style-type: none"> -Center for professional training -Workshops -Small Industries Exhibition. The first exhibition took place in MN for SMEs. 32 industries participated. Total sales exceed 15,000 L.E. -Wood Cluster improving program. The program consists of 3 parts; technical ,marketing, and designing
<p><u>Environmental</u></p> <p>Nothing was done to enhance environmental development in any of Beltan's villages</p>	<p><u>Environmental</u></p> <ul style="list-style-type: none"> -Planting the roofs of 5 schools -Execution of plantation water line. -Plantation of El-Masaken entrance -Street Ranger Project "Nazafet Hayena". The project is divided into 3 stages. First raising awareness by volunteering youth, Second NGOs role in raising awareness and monitoring cleaning company performance. Third, recycling projects

¹ The Local Initiative Fund (LIF) is one of the local development tools created under the Participatory Urban Management Program, a cooperation between the Egyptian Ministry of Planning and the GTZ.

Appendix (F): Monitoring projects proposed by PP in case studies

Table F-1: Monitoring projects proposed by PP team in Beltan and its six satellite village.

Source: LPC, 2010.

Village Name	Manshaa El Ammar	Monitoring
Environmental Projects	1-healthy automatic butchery 2-appropriate garbage cars to fit the narrow paths 3-pavment of narrow paths	1- Not done 2- Not done 3- Not done
Infra-structure Projects	1-continuous monitoring of water cleanliness and tanks hygiene 2-insulation of medium m voltage electric air lines penetrating village	1- Not done 2- Small part (outlets of transformers only)
Socio Economic Projects	1-Fruit packing factory 2-Marketing center for agricultural yields 3-activation of social development programs	1- Not done 2- Not done 3- Done plus the opening of a new NGO
Urban and Services Projects	1-Post office 2-Health unit including ambulance and fire station 3-Youth center 4-Public elementary school	1- Executed, but not in service 2- Not done 3- Not done 4- Done in 2008
Local Administration projects	1-Adjustment of the limits of the Urban Premises to contain population until 2022, by adding 1.35 Fadden. 2- Training courses for local public council employees to administer and run urban premises.	1- Not done 2- Not done

Village Name	Beltan	Monitoring
Environmental Projects	1-appropriate garbage cars to fit the narrow paths 2-pavment of narrow paths 3-covering drainage paths penetrating the village	1- Not done 2- Not done 3- Done before 2005
Infra- structure Projects	1-continous monitoring of water hygiene and cleanliness of tanks. 2-isolation of electric transformers that penetrates the urban fabric.	1- Done 2- Big part of them are now isolated
Socio Economic Projects	1-building animals food factory from rice hay. 2-activation of social development programs 3-marketing center for agricultural goods and satellite villages products.	1- Not done 2- Not done 3- Not done

Urban and Services Projects	1-development of health unit 2-building technical school for girls. 1-building one school.	1- Done in 2008/2009 2- Not done 3- Not done
Local Administration projects	1-Adjustment of the limits of the Urban Premises to contain population until 2022, by adding 4.2feddan. 2- Training courses for local public council employees to administer and run urban premises. 3-standardized legislation for dealing with agricultural pockets within urban fabric. Empowering the local popular council with sufficient machines to stop urbanization of agricultural land.	1- By 2007 2- Not done 3- Not done

Village Name	El Safaina	Monitoring
Environmental Projects	1-appropriate garbage cars to fit the narrow paths. 2-covering "Farsees" drainage. 3-pavment of narrow paths	1- Not done 2- Covering 100 m in 2009/2010 3- Not done
Infra-structure Projects	1-insulation of electric air lines 2-maintenance of water pipes and filtering of potable water.	1- Done in 2007/2008 2- Done
Socio Economic Projects	1-activation of social development programs	1- Not done
Urban and Services Projects	1-health unit 2-vet unit 3-development of youth center 4-Public elementary school and nursery	1- Not done 2- Not done 3- Not done 4- Not done
Local Administration projects	1-Adjustment of the limits of the Urban Premises to contain population until 2022, by adding 2.7 Fadden . 2- Training courses for local public council employees to administer and run urban premises.	1. Done in 2007 2. Not done
Village Name	El-Gazawia	Monitoring
Environmental Projects	1-appropriate garbage cars to fit the narrow paths 2-pavment of narrow paths 3-covering drainage paths penetrating the village	1- Not done 2- Not done 3- Done
Infra- structure Projects	1-development of potable water supplies. 2-projects of electricity supplements (development of current transformers and	1- Done 2- Not done 3- People

	building 4 new ones) 3-building healthy drainage system.	participated in offering land of the project, while the government didn't execute it.
Socio Economic Projects	1-automatic butchery and vet center. 2-activation of social development programs 3-poultry food and organic fertilizers factory. 4-small complex of workshops. 5-marketing center for agricultural goods and village products.	1- Not done 2- Two NGOs started "EL-Salam" and "Development of local society". 3- Not done 4- Not done 5- Not done
Urban and Services Projects	1-health unit 2-social and youth center 3-Post office and tele-communication center. 4-recreational park over the covered drainage path 5-Elementary public school 6-Offering 70 residential units as a part of a total of 350 units as a first phase.	1- Not done 2- Not done 3- Not done 4- Not done 5- Not done 6- Not done
Local Administration projects	1-Adjustment of the limits of the Urban Premises to contain population until 2022, by adding 3.44 Fadden. 2- Training courses for local public council employees to administer and run urban premises. 3-standardized legislation for dealing with agricultural pockets within urban fabric. Empowering the local popular council with sufficient machines to stop urbanization of agricultural land.	1. Not done 2. not done 3. Not done
Village Name	Zawyat Beltan	Monitoring
Environmental Projects	1-pavment of narrow paths 2-Organizing campaigns for raising environmental awareness among villagers.	7- Not done 8- Not done
Infra-structure Projects	1-development of potable water supplies. 2-building healthy drainage system. 3-projects of electricity supplements (development of current transformers and building 4 new ones)	1- Not done 2- Partial 3- Not done
Socio Economic Projects	1-activation of social development programs 2- Permanent Marketing center for the village 3-small complex of workshops.	1- Not done 2- Not done 3- Not done

Urban and Services Projects	1-building cultural center, public library and park. 2-elementary school 3-development and extension of the social center and health center. 4-Offering 200 residential units as a part of a total of 768 units as a first phase. 5-Post office and tele-communication center.	1- Not done 2- Not done 3- Health unit Done 2009, social center not done 4- Not done
Local Admin. Projects Local Admin. projects	1-Adjustment of the limits of the Urban Premises to contain population until 2022, by adding 3.44 Fadden. 2- Training courses for local public council employees to administer and run urban premises. 3-standardized legislation for dealing with agricultural pockets within urban fabric. Empowering the local popular council with sufficient machines to stop urbanization of agricultural land.	1- Not done 2- Not done 3- Not done
Village Name	EI-Abadlla	Monitoring
Environmental Projects	1-appropriate garbage cars to fit the narrow paths 2-pavment of narrow paths	1-thoruhg existing NGO 2-not done
Infra-structure Projects	1-insulation of electric air lines 2- continuous monitoring of water cleanliness and tanks hygiene	1-Not done 2-done
Socio Economic Projects	1-activation of social development programs 2- Marketing center for agricultural yields 3- local Micro-economic projects for local villagers	1- Not done 2- Not done 3- Not done
Urban and Services Projects	1-building services center which includes ambulance, fire station and vet unit 2-elementary school and nursery. 3-development of youth center sports fields. 4-Public library	1- Not done 2- Not done 3- Done 4- Done 2009/2010 through ministry of youth and sport

Local Administration projects	1-Adjustment of the limits of the Urban Premises to contain population until 2022, by adding 3.21 feddan . 2- Training courses for local public council employees to administer and run urban premises.	1- Not done 2- Not done
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Village Name	El Safa	Monitoring
Environmental Projects	1-appropriate garbage cars to fit the narrow paths 2-pavment of narrow paths 3-covering drainage paths penetrating the village	1- Through existing NGO 2- Not done
Infra structure Projects	1-continuous monitoring of water cleanliness and tanks hygiene 2-building healthy drainage system.	1-Done 2-Not done
Socio Economic Projects	1-Fruit packing factory 2-local Micro-economic projects for local villagers 3-activation of social development programs 4-puoltry food factory.	1- Not done 2- Not done 3- Not done 4- Not done
Urban and Services Projects	1-health unit and malaria Center 2-development and extensions to sport fields in the youth center 3-Post office and tele-communication center. 4-vet unit	1- Not done 2- Not done 3- Not done 4- Not done
Local Administration projects	1-Adjustment of the limits of the Urban Premises to contain population until 2022, by adding 3.44 Fadden. 2- Training courses for local public council employees to administer and run urban premises.	1- Done 2007 2- Not done

Table F-2: Monitoring proposed projects by PP team in MN
Source: GTZ advisor, “Mr. Khalil Shaat”, 2010.

Local area (sheiakha)	EI-Moadessa MN5	Monitoring
Environmental Projects	<ol style="list-style-type: none"> 1. visual awareness campaigns on environment 2. moving workshops outside the area 3. control and supervision on pollution sources 4. entertainment outlets 5. purchase of electricity generating machine and water pump station 	<ol style="list-style-type: none"> 1- Done 2- Partial done² 3- Partial done 4- Partial done 5- Partial done
Infrastructure Projects	<ol style="list-style-type: none"> 1. Completion of water and sewage projects 2. artificial bumps 	<ol style="list-style-type: none"> 1- Done 2- Done
Social Projects	<p><u>Health:</u></p> <ol style="list-style-type: none"> 1. availability of some technical and staff capabilities 2. -availability of space to construct a medical center Establishment of medical center <p><u>Education and culture:</u></p> <ol style="list-style-type: none"> 3. involvement and activation of NGOs 4. awareness for inhabitants on the importance of activities and non-violence 5. coordination with security authorities 6. supervision by education admin. 7. stress the importance of volunteerism 8. NGOs role in establishment of KGs 9. Fight tutorials by improvement centers with proper prices 10. Facilitate admin. procedures 11. Take advantage of libraries for study 12. Open illiteracy eradication classes 13. Increase teacher incentives 	<ol style="list-style-type: none"> 1- Done 2- Done 3- Done 4- Partially done 5- Partially done 6- Done 7- Partially done 8- Not done 9- Not done 10- Done partially 11- Done partially 12- Done partially
Urban and Services Projects	<ol style="list-style-type: none"> 1. improving the entrance of the area 2. moving workshops outside the area 3. pedestrian bridge, streets paving 4. -population resettling and area planning 	<ol style="list-style-type: none"> 1- Done 2- Partially done 3- Done 4- Done

² Partially done would be calculated as (1/2) a project done

Economic Projects	<ol style="list-style-type: none"> 1. admin. facilitation by district, authorities and concerned parties (license, funds, small exhibitions,..) 2. trainings for youth 	<ol style="list-style-type: none"> 1- Done 2- Done
Total	26	16

Local area (sheiakha)	EI-Masaken	Monitoring
Environment -al Projects	<ol style="list-style-type: none"> 1. -"regular garbage man" system 2. -supervision and awareness by district authorities 3. -sewage upgrading 4. -control workshops and old vehicles 5. -Planting 6. -Provision of proper garbage containers 	<ol style="list-style-type: none"> 1. Done 2. Done 3. Done 4. Not done 5. Done partially 6. Done
Infra-structure Projects	<ol style="list-style-type: none"> 1. -links from main water pump station 2. Establishment of new water pump stations 3. Consider technical security 	<ol style="list-style-type: none"> 1. Done 2. Done 3. Done
Social Projects	<p><u>Social:</u></p> <ol style="list-style-type: none"> 1. Studies and awareness campaigns 2. Activate the role of NGOs 3. Supervision and coordination with security and social apparatus <p><u>Health:</u></p> <ol style="list-style-type: none"> 4. increase funds 5. improvement of the medical center 6. supervision and control campaigns 7. increase the no. of physicians 8. awareness campaigns <p><u>education:</u></p> <ol style="list-style-type: none"> 9. Utilize the unused classes in order to minimize density 10. Implement the two-shift systems in schools 11. Activate the role of parents board 12. Control dropout 13. Establishment of kindergartens by NGOs 14. Renting play courts/ small shops within the school as a new source of income 15. Show appreciation for teachers (technical, moral and material) 16. School activities 17. Illiteracy eradication classes 	<ol style="list-style-type: none"> 1. Done 2. Done 3. Done 4. Done 5. Done 6. Partial 7. Done 8. Done 9. Done 10. Done 11. Partial 12. Not done 13. Not done 14. Not done 15. Done 16. Done 17. Done

Urban and Services Projects	<ol style="list-style-type: none"> 1. -broadening/ upgrade roads and streets 2. awareness 3. strict control and supervision on houses conditions(were most houses are not built on pillars) 	<ol style="list-style-type: none"> 1. Done 2. Done 3. Not done
Economic Projects	<ol style="list-style-type: none"> 1. introduce youth to labor market needs and expertise needed 2. different training courses 3. awareness by NGOs 4. invite businessmen and investors (small factories and enterprises) 5. facilitate loans ad funds 	<ol style="list-style-type: none"> 1- Done 2- Done 3- Done 4- Not done 5- Not done
Total	34	18

Local area (sheiakha)	Asfal el razaz	Monitoring
Enviro-nmental Projects	<ol style="list-style-type: none"> 1. Raise awareness to eliminate pollution inside inhabitance areas due to workshops, recordings sellers, garbage, and smoke. 2. Small carts used by hand 3. project for garbage containment carried out by youth 4. monetary penalties on inhabitants for garbage burning 5. Raise awareness to eliminate Piles of garbage (usually burnt by inhabitants) 6. Establishment of organized market 7. -Permanent supervision stations inside the market 8. -Existence of police station 9. -Paving and lightening streets 10. -Getting rid of un-authorized usage of public spaces 	<ol style="list-style-type: none"> 1- Done 2- done 3- Done 4- Not done 5- Done 6- Done partially 7- Not done 8- done 9- Done 10- Done partially
Infra-structure Projects	<ol style="list-style-type: none"> 1. Provision of alternate water motors 2. Facilitate access to water extensions license 3. Constant maintenance 	<ol style="list-style-type: none"> 1- Done 2- Done 3- Done

Social Projects	<p><u>Social:</u></p> <ol style="list-style-type: none"> 1. Awareness programs for elimination of tribal-like interrelations and female genital mutilation <p><u>Health:</u></p> <ol style="list-style-type: none"> 2. Upgrading the medical center 3. Awareness campaigns 4. Studies on spread diseases <p><u>education:</u></p> <ol style="list-style-type: none"> 5. Upgrading the schools area in the district 6. Establishing new schools 7. Income improvement 8. Activating parents boards 9. Admin. Supervision needed 10. Teacher training program 11. Establishment of public libraries 	<ol style="list-style-type: none"> 1- Done 2- Done 3- Done 4- Done 5- Done 6- Done 7- Done partially 8- done 9- Not done 10- Done partially 11- Done partially
Urban and Services Projects	<ol style="list-style-type: none"> 1. Establishment of stairs 2. Paving and broadening roads 	<ol style="list-style-type: none"> 1- Done 2- Done
Economic Projects	<ol style="list-style-type: none"> 3. Training centers 4. Alleviating obstacles before youth 5. Workshops Clusters 6. Awareness 7. Summer activities 	<ol style="list-style-type: none"> 3- Done 4- Not done 5- Done 6- Done 7- Done
Total	31	20
Local area (sheiakha)	EI-Gamea	Monitoring
Environmental Projects	<ol style="list-style-type: none"> 1. Coordination with garbage company to clear the area 2. Planting trees 	<ol style="list-style-type: none"> 1- Done 2- Done
Infra-structure Projects	<ol style="list-style-type: none"> 1. Completion of water and sewage projects 2. artificial bumps 	<ol style="list-style-type: none"> 1- Done 2- Done

Social Projects	<p><u>Social:</u></p> <ol style="list-style-type: none"> 1. Establishment of an NGO that provides activities: awareness/ volunteerism/ integrity 2. Establishment of an NGO that provides women rights awareness 3. Establishment of cinema/ events house/ youth centers/ park 4. Security measurements <p><u>Health:</u></p> <ol style="list-style-type: none"> 5. -Establishment of medical center 6. -Establishment of integrated hospital 7. -Providing specialist physicians 8. -Regular streets cleaning 9. Classes for special needs 10. -Awareness campaigns on birth control <p><u>Education and culture:</u></p> <ol style="list-style-type: none"> 11. New schools to contain students density 12. Establishing kindergarten 13. Integrated illiteracy eradication program 14. Integrated cultural seminars 15. Activating the control and supervision role on educational establishments 16. Technical facilities for schools 17. Schools activities 18. Activating the role of parents board 19. Teacher training programs 20. Establishment of public library 21. Designation of cultured employees 22. Awareness seminars 23. Cultural religious library 	<ol style="list-style-type: none"> 1- Done partially 2- Not done 3- Done 4- Done partially 5- Done 6- Done 7- Done 8- Done 9- Not done 10- Done 11- Done 12- Done 13- Done 14- Done 15- Done 16- Done 17- Done 18- Not done 19- Done 20- Done 21- Done 22- Done 23- Done
Urban and Services Projects	<ol style="list-style-type: none"> 1. -improving the entrance of the area 2. -moving workshops outside the area 3. pedestrian bridge, streets paving 4. -population resettling and area planning 	<ol style="list-style-type: none"> 1- Done 2- partially 3- Done 4- Done
Economic Projects	<ol style="list-style-type: none"> 1. -Establishment of organized market and shops 2. -Establishment of factories (paints, textile...) 3. -Governmental support to youth projects 4. moving workshops outside the area 5. -funds for SMEs 	<ol style="list-style-type: none"> 1- Not done 2- Not done 3- Partial done 4- Partially done 5- Partially done
Total	36	17
Total no. of Projects in the four local areas of MN		126
Percent of projects done		76%

Appendix (G): Meta data levels

In order to facilitate information comprehensibility among a wide range of participants with various educational levels, it is necessary to set up different user profiles according to some expertise level. This approach has led Foresman to propose three levels of metadata associated to three levels of users:

- 1-Simple users who do not need very detailed information regarding data.
 - 2-Decision makers including scientists and managers who have a very broad knowledge of the domain,
 - 3-Experts who matter the specifications and the structure of information.
- Foresman et al (1996)

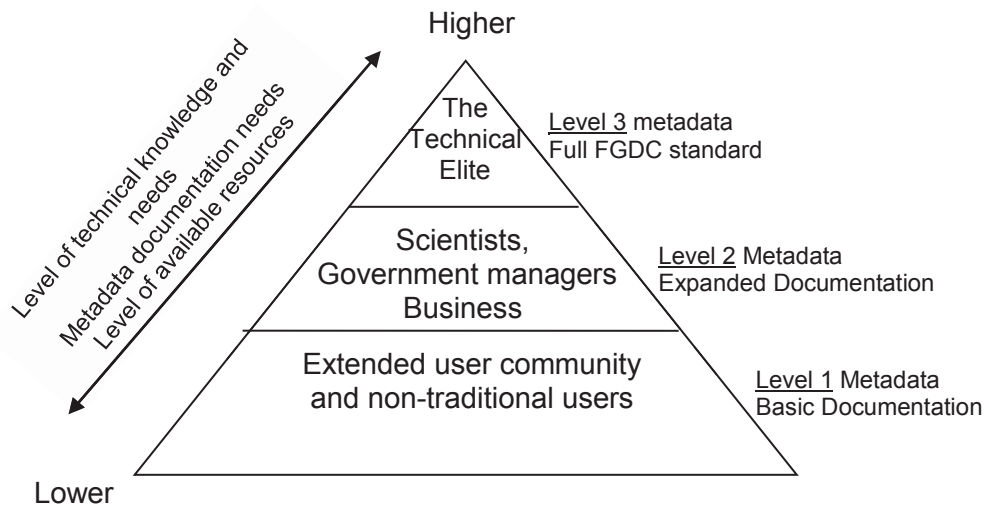


Fig. G-1 : Levels of metadata
Source: Foresman et al. (1996)

Appendix (H): Argument Documentation

Debate and argument modeling is an important issue in any PPP. Recorded argumentation can explain why particular decisions were taken and so has the capacity to justify recent decisions as well as inform future decision making and formulation of new policy.

Decision making in PPP is complex because it embraces so many different interests. Recording argumentation improves transparency, openness and accountability of the decision making process. Indeed arguments would appear to have something to offer in assisting and improving participation in PPP.

Modeling argumentation took several paths, among them Toulmin's simple model of argumentation (Toulmin 1958). It has three components: claims, data and warrants.

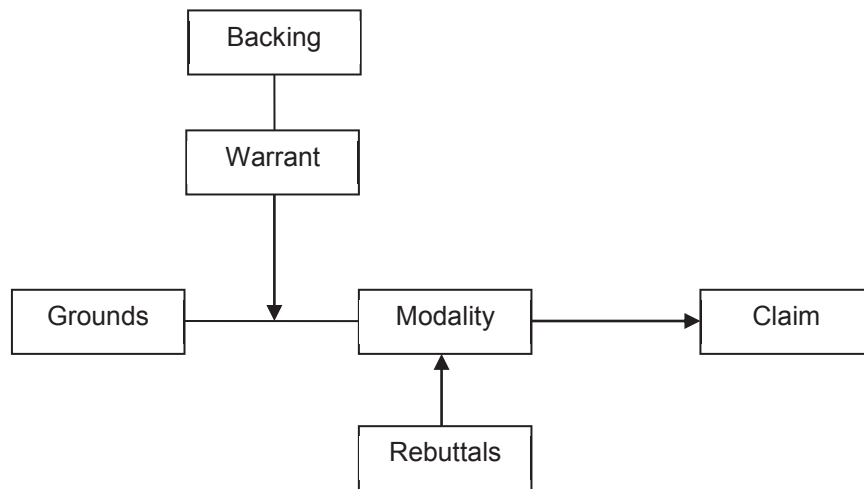


Fig. H-1 : Toulmin's structure for representing argumentation.
Source: Toulmin 1958

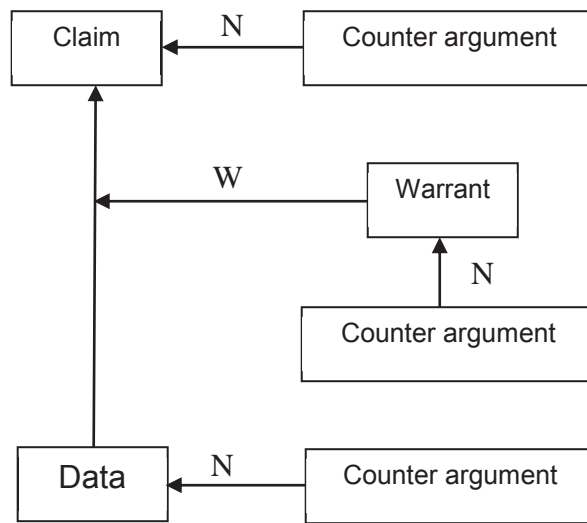


Fig. H-2: Gottsgein's model with counter arguments
Source: Gottsgein 1998

Data supports claims.

Claims are conclusions of an argument.

Warrants justify the inference of claims from data.

The data and warrants can also have backing in the form of additional data.

Both data and warrants could be the target of an attack or a counter-argument Gottsgein 1998. (fig.H-2)

An attack is assertion that weakens the function of its target until proven wrong.

Counter-arguments could be data or claims and often require backing.

"Data-warrant-claim" unit could be referred to as a "sub-argument", (Lourini 2001). (See Fig.H-3)

Sub-arguments are chained together to form larger threads of arguments.

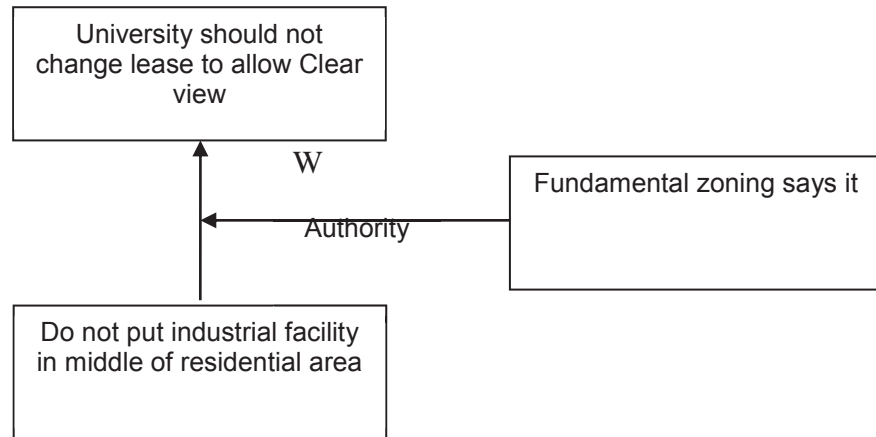


Fig. H-3: Example of sub-argument
Source: Lourini 2001

Appendix (I): Workflow Modeling

Laurini defined “Workflow” as:

“A workflow is a model to represent real work for further assessment, e.g., for describing a reliably repeatable sequence of operations. More abstractly, a workflow is a pattern of activity enabled by a systematic organization of resources, defined roles and mass, energy and information flows, into a work process that can be documented and learned.”

(Laurini, 2001)

The modeling of activities pertaining to a workflow can be built on different concepts. Kappel et al. (1998) have proposed a model based on the following concepts:

-Activity ordering: Activities which are part of a certain workflow have to be co-ordinated with the aspect of their execution order by means of an activity ordering policy. In case of PPP, there could be movement to and fro between the data collection and data analysis, until the problem is tightly covered and internally approved by all participants.

-User selection: in case of PPP, “user selection” is actually reversed into “activity selection”, where the participant could choose from the optional tasks whatever that could suit his/her capabilities and interests.

-Work list management: Each user is assigned a work list possibly belonging to several activities. Meaning that a participant could have un-successive roles in the PPP, like a role in data analysis, and a role in monitoring and evaluation of solution application. The two activities are not successive.

The control flow between activities is specified by means of an activity network relating activities to each other. This could take several forms, like;

-Sequencing activities, known as control structure, which is branching and joining

- dependency; the start of an activity could be the end of the successor activity, or the start of the predecessor, so two kinds of dependencies could be found, either end-start, or start-start.
- temporal constraints, specifying that one or several activities must be done in a certain time, or before a given date.

Fig. I-1 presents several types of activities ordering and branching.

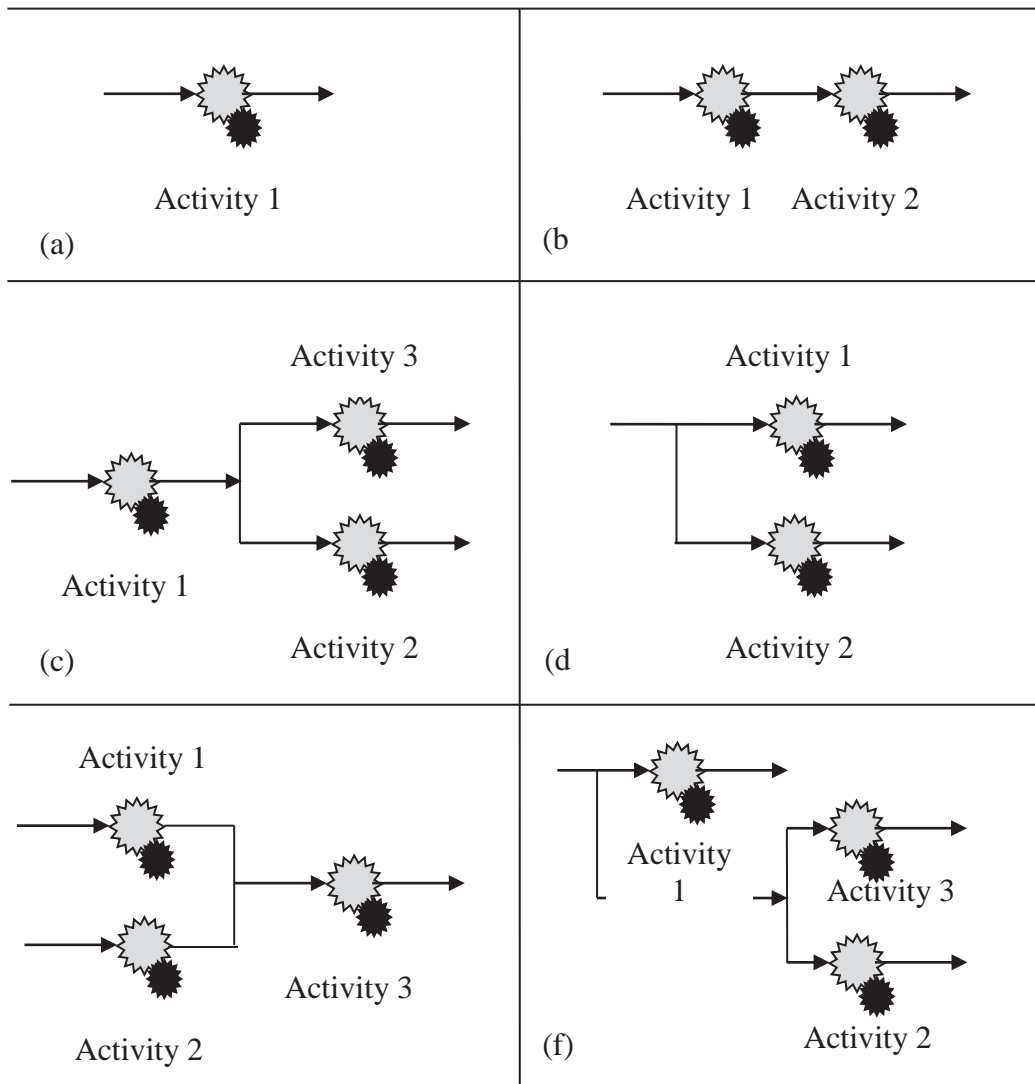


Fig.I-1 : Workflow modeling. (a) An activity. (b) Sequence of activities. (c) Branching process (fork). (d) Two activities in parallel. (e) and (f) more complex ordering of activities.

Source: Kappel et al. (1998) with modifications from Laurini (2001)

Appendix (J): El Dweiqa Rockslide in Mansheit Nasser (MN)

Although the GTZ and Cairo governorate had done great efforts to provide MN with adequate infrastructure, and support the Participatory Planning paradigm, yet after two years of their efforts, MN was in the front pages of the news;

"A catastrophe in Dweiqa", ran the front page headline of the official daily Al-Akhbar. "Huge boulders of the Moqattam hills fall on a shanty area, leaving hundreds dead, buried alive and thousands injured and homeless. The paper stressed official efforts to move the victims of the disaster to temporary tents and displaced people's camps in neighbouring parts of the city.

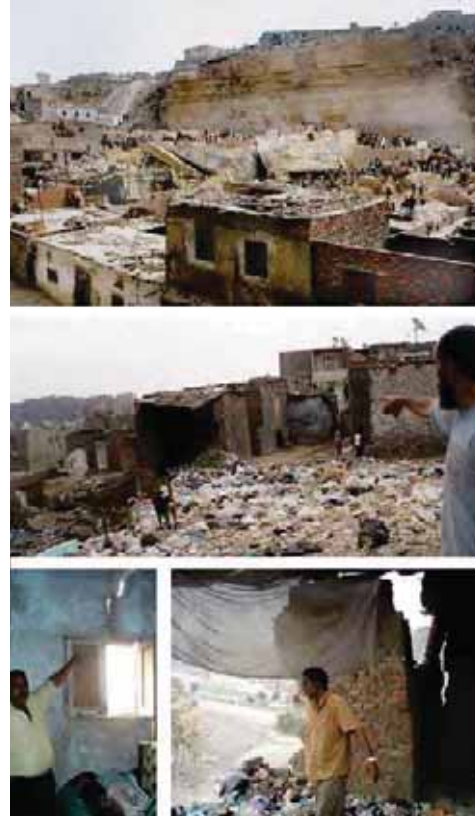


Fig.J-1 : In 2008, a rockslide in Dweiqa led to the death of 106 and injury of hundreds.

Source: Al-Ahram weekly, issue no.972. 2009

It is obvious that the PP that took place in MN lacked the proactive ability to predict such catastrophe and work to prevent it. Millions spent in providing MN with infra-structure was extremely needed and appreciated, but saving people's lives should have come first. There were many studies undergone to describe both the local area and community, but none were done to show what is crucial for the safety of people's lives. This is what the research calls "Fundamental Programs".

Appendix (K): Dynamic Network Analysis (DNA)

Generally Dynamic network analysis (DNA) is an emergent scientific field that brings together traditional social network analysis (SNA), link analysis (LA) and multi-agent systems (MAS) within network science and network theory . Katherine M. Carey is a leading pioneer in this field.

In PPP, DNA could be used to analyze the PPC from a social aspect. Such an analysis would help understand who are the most influential agents, who are the active ones and who are the most connected to resources and other agents. This kind of knowledge would help trace if there are any illegal actions or conspiracy on the PPC from any of its agents, or trace the future leader of the community, to train them to become facilitators in the PPC.

DNA is a suitable social analysis tool to the PPP, where they vary from traditional social networks in that they are larger, dynamic, multi-mode networks. The main difference of DNA to SNA is DNA taken the domain of time into account.

To facilitate the analysis of real and simulated data on PPC, Katherine et al, presented tools and measures that can handle community network data that is multi-mode, multi-link and multi-time period.

Katherine presented these tools in her trial to analyze El-Qaada social network and to assess the threats and power that it represents. Such a social network is dynamic like the PPC. The dynamics result from multiple change processes such as natural evolutionary processes for participants and facilitators, including learning, birth aging as well as intervention processes such as altering the set of individuals who lead a system.

In her case, data on El-Qaada was collected from a series of 368 texts on an organizational system interfaced with covert networks in the Middle East. Her model was designed to manage data that is incomplete, replete with errors, and difficult to collect, where her tools went behind traditional SNA

and link analysis to a new sub-field of SNA. Her proposed DNA combines the methods and techniques of SNA and link analysis with multi-agent simulation techniques to afford analysts with a set of techniques and tools for investigating complex and dynamic sociotechnical systems.

DNA tools include software packages for data collection, analysis, visualization and simulation. The process of data analysis includes tasks such as identifying relations among individuals and groups, characterizing the network's structure, locating the network elite, key and actors, points of vulnerability, and comparing networks.

By taking into account not just the web of relations among people and organizations, but also their relations with resources, knowledge, events, etc., key insights into diverse behaviors can be gained. (Kathleen et al, 2007).

Fig. k-1 illustrates the analysis of El-Qaada according to the following analysis parameters known as the "instances of meta-matrix entities": Name of agent, role, knowledge, resource, organization, location and Attributes.

This data was further analyzed to meet the DNA measures in fig. K-2 as follows: "Cognitive demand", "Degree centrality", "Boundary spanner", "Eigen Vector Centrality" and "Task Exclusivity". Each of the DNA measures is explained in fig. K-2.

Exemplary instances of meta-matrix entities

Meta-matrix entity								
Name of individual	Agent	Knowledge	Resource	Task-event	Organization	Location	Role	Attribute
Abdul Rahman Yasin		Chemicals	Chemicals	Bomb, World Trade Center	Al Qaeda		Operative	February 26, 1993
Abu Abbas	Hussein	Masterminding		Dying, Achille Lauro cruise ship hijacking	Green Berets	Iraq	Terrorist	Palestinian 1985 2000
Hisham Al Hussein		School	Phone, bomb			Baghdad Manila, Zamboanga	Second secretary	February 13, 2003, October 3, 2002
Abu Madja			Phone		Abu Sayyaf, Al Qaeda	Philippine	Leader	
Hamsiraji Ali			Phone		Abu Sayyaf, Al Qaeda	Philippine	Leader	
Abdurajak Janjalani	Jamal Mohammad Khalifa, Osama bin Laden							1980s brother-in-law
Hamsiraji Ali	Saddam Hussein		\$20,000		Abu Sayyaf, Iraqis	Basilan	Commander	
Muwa fak al-Ani		Business card	Bomb			Philippines, Manila	Terrorists, diplomat	Iraqi 1991

Fig. K-1: Exemplary instances of meta-matrix entities.
Source: Katheleen et al, 2007.

Key actors located by Intel report					
Measure	Rank	Value	Name of agent	Meaning	Interpretation
Cognitive demand	1	0.06	Mohammad Khatami	Measures the total cognitive effort expended by each agent to do its tasks.	Individual most likely to be an emergent leader. Isolation of this person will be moderately crippling for a medium time.
	2	0.06	Ali Khamenei		
	3	0.04	Hashemi Rafsanjani		
	4	0.02	Kamal Kharazi		
	5	0.02	Ali Montazeri		
Degree centrality	1	0.16	Mohammad Khatami	A node has high degree centrality if it is directly connected to a larger number of other nodes.	Individual most likely to diffuse new information, most likely to know information. Isolation of this person will be slightly crippling for a short time.
	2	0.10	Ali Khamenei		
	3	0.07	Hashemi Rafsanjani		
	4	0.04	Hashemi Shahroudi		
	5	0.04	Ali Montazeri		
Boundary spanner	1	1.00	Mohammad Khatami	A node is a boundary spanner if it is between otherwise predominantly disconnected groups of nodes.	Individual most likely to connect otherwise disconnected groups. Isolation of this person might increase instability.
	2	0.89	Ali Khamenei		
	3	0.87	Mohammad Reza Aref		
	4	0.83	Kamal Kharazi		
	5	0.57	Hashemi Rafsanjani		
Eigenvector centrality	1	1.00	Mohammad Khatami	A node has a high eigenvector centrality if the person is connected to many agents that are themselves well-connected	Individual who is most connected to most other critical people. Isolation of this person is likely to have little effect.
	2	0.77	Ali Khamenei		
	3	0.58	Hashemi Rafsanjani		
	4	0.41	Ali Montazeri		
	5	0.40	Ahmad Jannati		
Task exclusivity	1	0.03	Ali Khamenei	An agent node has high task exclusivity if for one or more of the tasks performed there are a dearth of others who perform the same task.	Critical individual, if the tasks are mission critical, isolation of this person is likely to be crippling.
	2	0.01	Kamal Kharazi		
	3	0.01	Mohammad Khatami		
	4	0.01	Reza Asefi		
	5	0.01	Hashemi Rafsanjani		

Fig. K-2:DNA measures

Source: Katheleen et al, 2007.

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رسالة مقدمة للحصول علي درجة الدكتوراة بعنوان:

نموذج ذاتي التكيف لعملية التخطيط بالمشاركة في البيئة المصرية

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استشاري أكاديمية البحث العلمي

القاهرة

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جامعة عين شمس
كلية الهندسة
قسم التخطيط العمراني

رسالة دكتوراة:

أسم الطالب: نشوي أحمد وائل شلبي
عنوان الرسالة: نموذج ذاتي التكيف لعملية التخطيط بالمشاركة في البيئة المصرية

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ملخص الرسالة

أوضحت الدراسة التحليلية لنتائج التطبيق العملي الحالية للتخطيط بالمشاركة حياة عن مبادئه الأساسية و إخفاقه في تحقيق أهدافه و يتمثل ذلك في مجموعة من السلبيات الآتية:

صعوبة التطبيق □ قلة نسبة المشاركة للأطراف ذوي الصلة □ عدم إستدامة العملية □ قصر نتائج العملية علي مساعدة المجتمع علي حل مشكلة بعينها أو مشكلات محدودة.

و علي هذا يقترح البحث تغيير منهجي للتخطيط بالمشاركة يهدف إلي:

- سهولة التطبيق من خلال إعداد الوسائط المتعددة
 - الإستخدام لتتناسب كافة المستويات و الشرائح الاجتماعية
 - إستقطاب أعلى نسبة مشاركة للأطراف ذات الصلة من حيث العدد و الإتصال المباشر بالمشكلة المطروحة و إستيعاب أبعادها.
 - وضع برنامج و آلية تتسم بالإستدامة في طرح المشاكل و حلها.
 - العمل علي تمكين فئات المجتمع من حل مشاكلهم النوعية المتعددة
 - مثل البطالة / تمكين المراهق / المشاكل العمرانية و البيئية / الفقر و المهمشين . □ بناء قدراتهم □ مثل إستخدام برامج التدريب النوعية .
- و يقدم البحث تحليل متكامل للمشاكل المعقدة لعملية التخطيط بالمشاركة من عدة أوجه □ مشاكل تخطيطية، مشاكل إجتماعية، و مشاكل معلوماتية □ و قد خلص الجزء النظري من البحث إلي تعريف العوامل التي تؤثر علي نجاح عملية التخطيط بالمشاركة □ ثم تم اختيار منطقتين في البيئة المصرية و اللتين تم تطويرهما عن طريق التخطيط بالمشاركة لدراسة العوامل التخطيطية والإجتماعية و المعلوماتية السالفة الذكر □ وقد روعي التنوع في حالات الدراسة عن طريق إختيار دراسة حالة ريفية متمثلة في قرية بلتان بمحافظة القليوبية و أخرى حضرية متمثلة في منشية ناصر بمحافظة القاهرة □ □ □

وخلصت دراسة الحالتين بالخروج بعدة معايير و مبادئ تؤثر علي نجاح عملية التخطيط بالمشاركة وتعد كمدخلات لنموذج لتلك العملية.

و قد إستخدم البحث أسلوب نمذجة يسمي □ نموذج متعدد الوكلاء □ □ □ شركاء التنمية □ لشرح المفاهيم الأساسية للنهج المقترح.

و قد استعرض نموذج التخطيط التشاركي المتعدد الوكلاء تقديم و إقترح حلول متكاملة تتناول الثلاثة أوجه التالية:

حلول تخطيطية و تتمثل في:

- ديناميكية التخطيط بالمشاركة
- تخطيط بالمشاركة ذاتي التكيف
- آلية التعلم المجتمعي الذاتي

حلول اجتماعية و تتمثل في:

- آلية التنظيم المجتمعي الذاتي
- شبكة إتصالات اجتماعية

حلول معلوماتية و تتمثل في:

- نظام معلوماتي تكاملي

وقد إستخدمت في البحث □ اللغة المتحدة للنمذجة □، و هي لغة تعتمد على الرسومات البيانية، في توضيح الوكلاء المعنيين بعملية التخطيط بالمشاركة و القوانين المنظمة للعلاقات المتبادلة بينهم □ ذلك بالاضافة الي توضيح تفصيلي لأنشطة الوكلاء و العمل التكاملي فيما بينهم لإنجاز تلك الأنشطة، مع ذكر مكونات النموذج و طريقة تشغيله.

قل إن صلاتى و نسكى و محياي و مماتى لله رب العالمين

لا شريك له

و بذلك أمرت و أنا من المسلمين



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29. August 2011

Report on the PhD thesis
Presented by
Arch. Nachwa Wael Shalaby

With great interest I have read the PhD thesis “Integrated Adaptive Model for the Participatory Planning Process” presented by Nashwa Wael Shalaby. The report deals with a relevant and timely subject: a review of the current participatory planning practices in the development context where the author identifies a widening gap between rhetoric, ambitions, starting principle and actual achievements on the ground. The author draws her research motivation from a critique of the confusing jungle of methods and tools that characterizes current practice, the lengthy and often ineffective planning processes, the tendency to reduce the breadth of participation to a few select stakeholder representatives (instead of the broader public), the high dependency on external professionals and donors. She poignantly critiques that the pressure of time, budget, politics and populism, in reality, leads to a new kind of top-down planning disguised in the politically correct participation rhetoric.

The ambition of the author is no less than to develop an alternative model that could address some of the above insufficiencies and dysfunctionalities. She calls for a paradigm shift in the participatory planning discourse. With impressive rigour and consistency she then sets out to develop an extensive proposal. The core of the proposed model is to shift emphasis from a “result-based” approach to an emphasis on a better structuring of the process of participation itself. The proposed concept - Participatory Planning Process (PPP) – intends to make participatory planning more applicable and sustainable, and therefore deliver better on the initial aims and promises of participation.

This shift to process reflects the current global discourse in the participatory planning debate and is therefore not in itself new. Yet the disciplinary field in which the author seeks solutions opens up an interesting and challenging new perspective: Her core interest lies in connecting participatory planning with the new opportunities provided by Information Communication Technology (ICT). Inspired by the tradition of complexity science and cybernetics the author believes in a “biological bottom up paradigm” – comparable to swarm intelligence that is also reflected in what the author called the “wiki-approach”. This, it is argued, can increase the breadth of participation, make time of participation and process more effective and lead to better and more sustainable results.

How could this work in practice? The author develops a complex model for a PPP. With admirable attention to detail each element is defined and described in its functionality including agents roles, interfaces, information flows and loops. The originality of the proposed model lies in the argument that planning processes would thrive through the addition of a central data bank. This data bank would be a kind of “neutral agent” which becomes the key interface of the process and therefore mediates between the various inputs and expectations of local citizens, experts or the central planning body – the Participatory Planning Committee (PPC). The author argues that this data platform could not only combine and synthesize the various inputs provided citizens, experts and planning bodies or to make discussions transparent (reporting, documenting), but also widen the range of citizens actively involved in the planning process (“active citizens”), but also make the finding of solutions faster and more effective. With admirable detail, the thesis provides a design brief for this data bank, including details such as entry or evaluation forms.

Nashwa Wael Shalaby’s approach recalls debates of the early discourse on participatory planning in the 1960s and 70s, championed by cybernetics scholars such as Horst Rittel (Stuttgart, Boston), and rooted in a then widespread belief in the need for a more objectified and scientific planning and design process. In a context where many practitioners involved in development planning – including myself - have become sceptical and rather biased against technological solutions her argument is challenging and original. The structure of the thesis is systematic, economical and tightly argued. Impressive is the consistency within which each part and chapter builds upon the previous one. A highlight remains the analysis of two Egyptian case studies recently completed in Egypt (chapter five), which show the current status quo of participatory planning. The analysis is based upon comprehensive questionnaires and documented in very conclusive comparative tables.

Due to the subject matter and research methodology chosen the thesis is extremely dense, and as a result arguments are often presented in note form using an at times confusing number of tables, charts, diagrams and acronyms. One cannot help to ask: Can this degree of complexity be communicated to citizens, many of them illiterate? Is the high degree of technology-dependency through the introduction of the data bank actually feasible – logistically, budget-wise, or in terms of social acceptability? Would a complex IT-dependent model actually engender trust in communities which have become highly suspicious of technical tools, confusing surveys or virtual communication processes in the service of large-scale investors or authoritarian government. Perhaps a few reflexions on such challenges and risks would have been helpful to round up what otherwise remains a very impressive result.

The author confidently defends her approach by reminding us of the crucial role new social media play and IT-dependent social networking tools played in the recent Jasmine revolution across the Arab World. On the other hand she rightly acknowledges that much of the success of her model will depend on more research into the design of appropriate, easy-to-use interfaces, which could include social networking technologies. One hopes that the author will have the opportunity to follow up on such questions in her own practice and research.

I recommend that this interesting and original research by Nashwa Wael Shalaby is worthy of a Ph.D. degree.

A handwritten signature in black ink, appearing to read 'Misselwitz', written in a cursive style.

Prof. Dr.-Ing. Philipp Misselwitz
Stuttgart, 29.08.2011