Sustainable Resource Management as a Core Theme in Planning for the Poor – A Study in the Egyptian Rural Areas

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Abstract

A profusion of experimental technologies and pilot projects has recently introduced innovative ways of managing resources. These advancements promise to be considerably more sustainable than current usual practices. The challenge of sustainable planning for rural areas is raised. Resource management is discussed as a major theme for attaining sustainability in Egyptian villages. To approach sustainable resource management, appropriate technical and empowerment issues are studied, with a focus on elaborating sustainable measures in planning and regulations. These include the scaling up of existing technologies and appropriate techniques, and providing efficient governance and management of all available rural resources. Selected best practices are cited, and development criteria addressed to apply to the planning and development of typical Egyptian rural areas. Eight levels of empowerment indicators are developed to outline a planning initiative that incorporates potential elements to achieve the overall objectives over a given period of time. The conclusion indicates the importance of integrating appropriate technologies into an improved management of governance policies and programs; focusing this integration on the management of resources in the rural areas, in terms of sustainable interventions with mobilization of the capacity of the various groups of village actors/stakeholders.

1. Introduction

The world's resources make it possible for man to exist on planet "earth" and reproduce after its own kind. These resources have come to be known as "natural resources" which include the geophysical resources of water, soil and its productive qualities, intermediate and long-term carbon stocks, biodiversity of the managed landscapes, and the stability and resilience of the ecosystem (CGIAR, 2003). In the early ages, when human populations were low, there were more than enough of these resources for each person; there was no shortage and presumably therefore, no conflicts over these resources. Consequently, an erroneous impression was created that these resources were infinite, indestructible and permanent, no matter how they were used or managed. That impression is no longer valid. Even more worrisome is the realization that that these resources can be completely destroyed, while some elements of resources are subject to extinction.

1.1. Problem

Under the conditions of uncertainty, adaptation to sustainable resource management is not a one time solution; but a continuous process, varied at spatial and temporal scales. Tensions are being monitored in policy goals related to framing most rural issues. A stop-gap measure is needed to bridge between adaptive approaches to resource management in rural areas and provision for concrete on-the-ground actions, demonstrations, and United Nation Development Programme's niche for long term adaptive capacity development.

1.2. Motivation

Growing emphasis in the Egyptian policy is being given to the objectives of rural sustainable development. In this sense, sustainable natural resource use and management make novel demands on governance arrangements, the design of which requires normative guidance. Disconnection between community needs and policy coordination, the dominance of technical/structural response, added to the availability of local coping strategies and lessons from multiple disciplines, e.g., sustainable livelihoods, disaster mitigation, natural and resource management; allow for a potential to strategy integration. Hence, a study of technical and technological dimensions is necessary to ensure retrofitting and construction of energy-efficient communities.

1.3. Hypothesis

In the context of different interpersonal settings, developed local indicators and instruments on natural resources and energy consumption in the poor rural areas in Egypt are hypothesized to help achieve better housing related conditions and sustainable living for their inhabitants over time, and promoting a national identity based on integrated resource management principles.

1.4. Aims

The study aims to explore the resource management systems necessary both to undertake sustainable planning endeavors and ensure maximum responsibility and effective incorporation of all the involved agencies and parties in these systems. With special attention given to the "energy" element, the study attempts to approach methods suitable to sustain reliable and efficient energy sources, while reconciling three deeply held set of values: economic growth; social vitality; and ecological integrity. In this regard, the following questions are raised:

1. How is resource planning and management currently organized in rural Egypt?

2. What measures could be made to make resource planning and management more coherent and effective including the use of techniques to assess sustainability?

3. How does resource planning and management link to other dimensions of sustainability?

4. How might shortfalls and/or incoherence be reduced or eliminated?

5. What institutional change would facilitate a more coherent and effective resource planning and management?

6. What general steps should be taken and instruments to ensure that plans are actually implemented, i.e. in terms of governance and participation?

1.5. Methodology

To achieve the aims of the study, a number of remedial actions and instruments are discussed. They include governance principles to scale up energy and resource conservation as integral parts of sustainable development; combining process models of spatial planning with geo-information based instruments, reform of the government to ensure an environment of adequate quality for the inhabitants, and examining the concept of inclusiveness, empowerment, and active engagement with urban and rural citizens. Selected best practices are cited, and development criteria addressed to apply to the planning and development of typical Egyptian rural areas. Eight levels of empowerment

indicators are developed to examine sustainability in its five critical resource domains: (1) energy, (2) land, (3) agriculture and water, (4) solid waste, and (5) people. These principles incorporate the potential elements to achieve the overall objectives over a given period of time.

2. Previous studies

Sustainable resource management has become a viable and strategic topic, integrating environmental and economic considerations into a general planning framework. Several critical conceptual threads have evolved throughout studies of sustainability: (1) a distinction between qualitative and quantitative changes in the utilization of technologies and natural resource base (i.e. development vs. growth); (2) a focus on social justice, stability and empowerment with particular emphasis on reducing poverty and maintaining an adequate quality of life for all residents; and (3) borrowing from principles of the innovative concept of investing in climate change. (Nemetz and Mohamed Bayoumi). Rural as well as urban energy planning for sustainability is a major challenge. For the "energy" element, sustainable planning favors the means of replacing fossil fuels with energy from renewable sources; exploring how to reduce the need for energy. The following addresses some of the recent contribution to this debate.

2.1. Integrated Natural Resources Management (INRM)

Integrated Natural Resources Management (INRM) is an approach that integrates research on different types of natural resources, into stakeholder-driven processes of adaptive management and innovation, to improve livelihoods, agro-ecosystem resilience, and environmental services, at community, eco-regional, and global scales of intervention and impact, Figure 1. (Atta-Krah, Kwesi, 2006, p. 9). At the core of this system, came the people, livelihoods, and rights.

Two points are worth making at this juncture. The first is that the use of resources must be within the framework of sustainability. It is the responsibility of man to ensure that the way resources are used today does not compromise their availability for tomorrow. Sustainability in this context involves successful management of resources to satisfy changing human needs, while maintaining or enhancing the quality of the environment, Figure 2. (Atta-Krah, K., 2006, p. 9)

Experience suggests that innovative approaches and financial mechanism with active involvement of CSOs are highly successful in compensating the failings of conventional financial mechanism for the poor. (UNDP, 2008).

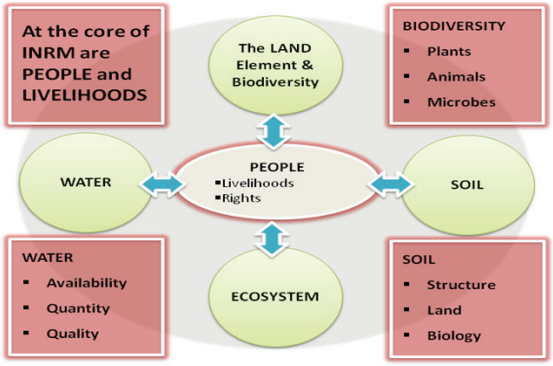


Figure 1. INRM Components and interactions. (Atta-Krah, Kwesi, 2006, p. 9)

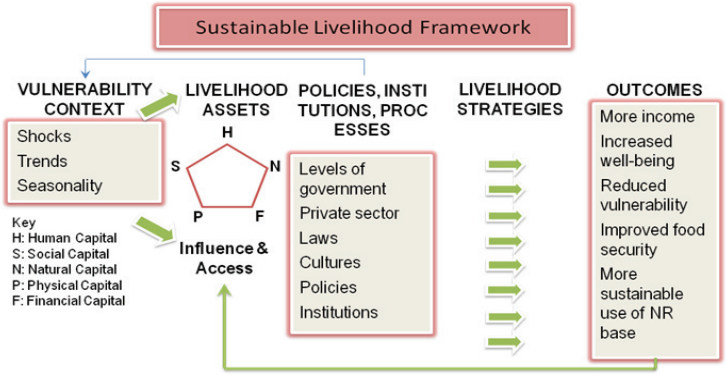


Figure 2. Sustainable rural livelihoods: a framework for analysis (Krantz, Lasse (2001)

2.2. Beyond-participation Concepts of Inclusiveness, Empowerment, and Active Engagement

A drawback of participatory planning is that it makes planning more complex. It leads to a demand on communication about, and exchange of spatial information. Currently, Planning Support Systems (PSS) are being developed to support participatory spatial planning processes by combining process models of spatial planning with geo-information based instruments, Figure 3. (Kymo, S et al. 2007, pp. 2-7).

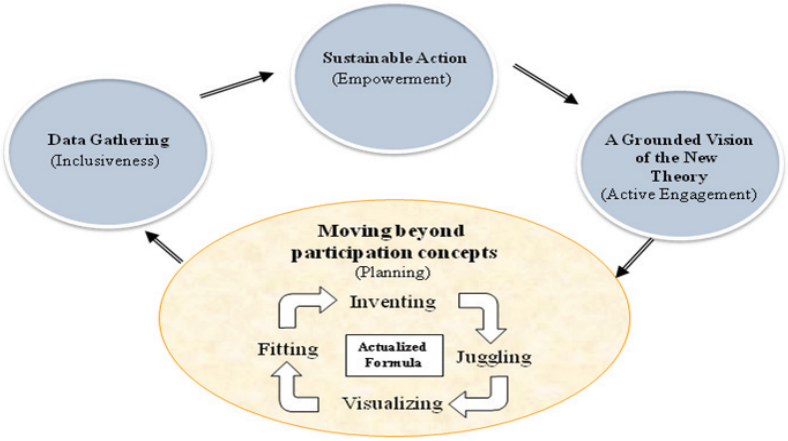


Figure 3. Concepts of inclusiveness, empowerment, and active engagement with urban and rural citizens (Source: the author)

3. Governance and institutional support

The focus of this paper has been on the potential arrangements that could be put in place to give effect to decentralization and its impact on natural resource management in the Egyptian rural areas. It is not possible to assess the impact of democratic decentralization in rural Egypt for the simple reason that decentralization in this sector is incomplete. In the area of land administration, there has been no legislation that allows selling state-owned land to the people who control it. Law no. 31/1984 stated that the controller is considered a transgressor on state-owned land. Three ministerial resolutions followed to organize the transfer of ownership in sprawled areas; the most prominent of which (Resolution No. 1558) is contributed to evicting certain individuals and upgrading and developing slums, if such actions will benefit the public. Although laws exist to establish developmental local government, the full implementation has yet to happen. According to 2004/2005 consensus, the poor represent 23.4% of total Egyptian population, most of which are located in the upper rural areas, Table 1. (UNDP, 2008, p. 297)

Table 1. Rural-urban gaps (UNDP, 2008)

Measure	Field	Year	(%)
•Rural population (% of total)		2004	58.4
		2006	57.36
•Households with access to health services (%)	−urban	2004	100
	−rural	2004	99
•Household with access to piped water (%)	−urban	2006	98.8
	−rural	2006	92.9
•Households with access to sanitation (%)	−urban	2006	82.5
	−rural	2006	24.3
•Literacy (15+) (%)	−urban	2006	79.1
	−rural	2006	62
•Rural-urban disparity	−health services	2004	99
	−piped water	2006	94
	−sanitation	2006	29.5
	−literacy	2006	78

Several central and local governmental bodies are responsible for shelter issues and slum areas' upgrading in the Egyptian urban and rural areas: (1) the General Organization for Physical Planning (GOPP) and the Ministry of Housing, Utilities, and Urban Development (HUUD); (2) the Ministry of Planning and Local Development; (3) governorates, through their Housing Directorate and Urban Planning Departments; and (4) the Social Fund for Development.

4. Approaching an integrated INRM Strategy: SWOT analysis of the development themes in rural Egypt

Egyptian villages are typically famous for their fertile agricultural land. The GOPP has been assigned to prepare strategic urban plans for all Egyptian villages and cities in order to protect agricultural land from informal encroachment. Land price has shifted form the cultivation (with an average of approx. $27,000/acre) to the built category (approx. $270,000/acre). Impelled by the price gap between the two categories of land element, continuing attempts to include cultivated lands into the urban mass have been observed. Current major rural development projects running in Egypt include:

- Urgent plan (one million LE for each village until 2017),
- MISR project for developing the least developed 58 districts according to the latest human development index,
- Shorouk Program (to provide rural areas with the infrastructure based of local participation),
- Roots (a social capital approach - to link between VIPs and their origin rural areas – still proposed),
- Sectoral development plans by each ministry.

The SWOT analysis in Table 2 is induced from a research project conducted in some Egyptian villages, and accomplished in collaboration with the GOPP. A rapid profiling of urban conditions at national and local levels has been developed for a number of Egyptian villages. (GOPP, 2007) The selected villages represent a wide range of local conditions. The analysis focuses on four main themes: (1) governance and rural poverty alleviation; (2) environmental issues; (3) common basic urban and rural services; and (4) potentials of local economic development. Information is collected through standard interviews and discussions with institutions and key informants, in order to assess the strengths, weaknesses, opportunities, and threats (SWOT) of the national (external environment) and local (internal environment) urban settings. The findings were presented and refined during village and professional consultation workshops with the GOPP, regarding priority interventions.

Table 2. SWOT analysis of the development themes in rural Egypt

Strengths	Weaknesses	Opportunities	Threats
1. Governance and rural poverty alleviation.			
1.a. Resource Mobilization			
− Availability of diverse sources of income for local administration units. −Efficiency of local administration unit in collecting construction fees and related taxes.	− The village is run under supervision of the central government. − The budget is often centralized, not reflecting the actual needs of local administrations.	− Availability of funding sources for the projects straight from the National Budget. −The presence of programs (though weak) in the governorate to train technicians.	− The current development policy limits efficiency in the process of project funding. − No encouragement for private projects that provide extra sources of income for the local administrations.
1.b. Institutional Assessment: Performance and Abilities			
− A separate division is concerned with residents' complaints. −The local people's council supervises the complaint-related problem solving.	− Except through the central administration, there is no other obvious local planning for budget distribution.		−No budget comparison. −Difficulties in following up with changes of budget demands of the local administration units.
1.c. Poverty Alleviation and Improving Social Standards			
− The CBOs and NGOs are working on decreasing poverty and taking care of poor families. − Women are represented in the local administration unit through an executive mechanism.	− Weakness of women representation in the people's councils. − The local government does not participate with the local community in budget planning.		− There is no present policy for crime elimination or future plans for community watch programs.
1.d. Institutional set up – Local Authority's Resources and Capacity Building			
−Availability of n obvious role for the investors, CBOs and NGOs in the field of training employees in several fields.	−Lack of transparency in discussing projects. −Financial disabilities of organizations	−Employment in the local government takes place through competitions; giving the chance to hire capable personnel.	−Weakness of the local institutions in generating credits for poor regions.



a



b

Figure 4. Mismanagement of the land element in (a) Mit Halfa, and (b) Mit Nama villages in Qaliubeya Governorate, Egypt. Source: the author.

Strengths	Weaknesses	Opportunities	Threats
2. Environmental issues			
2.a. Regulatory and Institutional Framework			
−Governorate ‘s concern for environmental issues, particularly, the solid waste. −Coordination between the different executive actors. −Cooperation between the governorates and research institutes. −Promoting workshops for public partnerships between local units and community associations.	−Lack of measurement equipment − Incompliance of private sectors’ most establishments with environmental conditions. − Ineffectiveness of institutional and administrative capabilities. −Bureaucratic procedures which are the main obstacle facing community associations to perform local partners.	−The availability of financial resources from the center to support environmental projects. −UN-Habitat and World Bank projects are good opportunities to acquire sustainability understanding and guide to efficient executive planning procedures.	−The slow pace of court proceedings in finalizing environmental cases. − Lack of a unified and generalized format for environmental citations at country level. −Reduced rate of monitoring and inspection activities.
2.b. Resources Mobilization - Financing			
−Availability of financial resources from the state budget, local development, and the (EEAA). −Some of community associations, working in the environmental field, receive donations from foreign agencies.	−Environmental Management Units (EMUs) hardly collects any financial resources. −No budget allocated for raising environmental awareness. −Lack of finance to implement local community associations’ activities.	−The World Bank’s concern about Egyptian rural areas as one of the major priorities for the country’s future development.	−Collected revenues from environmental fines go directly to the environment preservation fund in Cairo. −Lack of financial resources allocated for EMUs results in lack of equipment.
2.c. Performance – Reduced Pollution			
−Governorate inclusion in the environmental issues in development plans. −EMU officials coordinate and cooperate with consultancy centers in Universities. −Community associations cooperate with social affairs to solve the problems in areas, are uncovered by local authorities.	−Accumulation of waste in the streets. − Incompliance of private sector with environmental conditions. − Lack of rural residents’ environmental awareness −The black smog clouds resulting from burning rice straw. −lackofrecyclingadvances.	−A number of active engagements between local administrations and community stakeholders to establish rice straw recycling plants and allocate landfills. −Community associations showed interest in funding environmental protection projects.	− The often long distance between villages and allocated areas for landfills. − Continuation of interpenetration of residential & informal industries. −Expected to dry within a few years, most ground water wells are poisoned with high percentage of Manganese.



a



b

Figure 5. Mismanagement of water resources and solid waste in (a) Mit Nama, and (b) Halaba villages in Qaliubeya Governorate, Egypt. Source: the author.

Strengths	Weaknesses	Opportunities	Threats
3. Common basic urban and rural services.			
3.a. Provision of Basic Urban Services			
–Installing a manganese treatment unit for water wells. –Expansion of treatment plants. –Expansion of sloped networks for satellite villages and slums. –Private companies are encouraged to take the responsibility of solid waste collection in increasing number of villages and slum areas. –New landfills are under construction with adjacent recycling plants.	–Water is polluted in most canals. –Weak water pressure in stories above the ground levels. –Network lines are almost old and with inefficient valves. –Polluted underground water. –Brick factories dump their waste in the regular sewage network. –Septic tanks or trenches empty into water drains and canals. –Overflow of the serviced areas. –Solid waste burning. –Dangerous crossroads and intersections.	–Recent improvements in water, sewage, and solid waste management services. –Several clean water canals are still clean, and used as the main source for drinking water. –Transportation system is often run by both public and private sectors.	–Weak water pressure hampers any possible expansion of agricultural or industrial activities, and weakens the potential growth of local economy. –Dumping sewage and solid waste on canals causes sever pollution for the current main source of water supply. –No industrial waste network. –Unsecure and weak capacity of hazardous waste disposal. –Uncontrolled and insufficient waste disposal systems.
3.b. Resources Mobilization			
–Self-initiated construction of internal roads. –User charge for solid waste collection.	–Insufficient donors' support. –Insufficient governmental finance.	–Availability of a number of donation and grants.	–Insufficient Donors' interest in finance and technical support.
3.c. Institutional Support			
–CBOs work in cooperation with local units' administrations to extend services to poor areas. –CBOS are willing to provide land for sewage plant.	–Weak collection system by the local authority. –Weak capability in collecting user charges for the service.	–Availability of data by the urban observatory and new census.	–Limited maintenance or renewal of main networks' components.
3.d. Training and Capacity Building			
–Training courses for local staff provided by the General Organization for Water Supply and Sanitation.	–Insufficient training programs for decision makers and technicians. –Lack of equipment and logistics.		–Loss of state resources due to lack of maintenance and monitoring capacities.

Strengths	Weaknesses	Opportunities	Threats
 a		 b	

Figure 6. Providing basic urban services in rural areas: (a, b) installation of sanitary network as observed in Mahalet Abu Aly village, Qaliubeya Governorate, Egypt. Source: the author.

4. local economic development.			
4.a. Local economy Dynamics & Issues of the Local Economic Development			
−Agricultural land mostly with high fertility in Egyptian villages −Availability of large parcel of hinterlands that could be utilized −Untapped tourism potential. −Untapped human resource potential. −Untapped waste management potential if treated as a resource.	−Lack of industrial zoning within rural areas. −Presence of informal markets that lead to poor quality control and inflation of the goods' prices. −No guarantees to get access to credit and loans by rural poor. −Rural customs and habits that limit the active engagement of women in labor market. −Non-compliance of existing skills and graduates with labor market needs.	−Acquiring a new desert hinterland for the governorate to attract local private investments. −Planning for rural industrial zones would improve the local economy. −Improving training centers. −Establishing sewing and fashion school would offer large job opportunities for women. −Defining a location for weekly market provides good marketing opportunity for local goods. −Untapped commercial and marketing opportunities.	−The complexity of the land tenure situation and the manifold aspects if such properties are to be redeveloped. −Few job opportunities vs. high unemployment rates. −Lack of overall investment plans.
4.b. Institutional Setup			
−Effective role of local authorities in coordinating different lending bodies to acquire soft-loans or credits for young graduates. −The reach out of the higher committee for investment in the governorate to all local partners.	−No investment map is available to show the potential investment areas. −No efficient guarantees for the poor to get access to credits or loans. −Inappropriate qualifications affecting women's ability to work, largely due to old traditions and habits of rural societies.	−Rural local authorities coordinate between young graduates and different vocational training centers. −Simplified procedures of issuing permits for infrastructure development. −Negotiations between the tenure of Awqaf authority board and tenants to redevelop the land. −Efficient use of villages' hinterlands if exist.	−Only little achievement has occurred in acquiring credit or loans for young graduates. −Obstacles face the poor in getting jobs such as illiteracy and schools dropout.

 a

 b

Figure 7. Economic development can be adopted by scaling up existing technologies and appropriate techniques in: (a) Mahalet Abu Aly village in Kafr El-Sheikh Governorate, and (b) Sanafeer village in Qaliubeya Governorate, Egypt. Source: the author.

5. The capacity challenge in Egyptian rural communities

In many rural communities with potential renewable energy resources, there does not currently exist either the development experience or the institutional capacity to manage the resources necessary to develop new energy sources. Whether this is a biomass energy opportunity, a wind resource opportunity, or a concentrated solar resource, potential community development and redevelopment opportunities are relinquished to outside entities and interests because rural communities do not have the experience and institutional capacity to develop and manage these resources. Poverty ratio in Egypt was 24%, 19%, 16.7% in 1990/91, 1995/96 and 1999/2000 respectively, yet with regional disparities i.e. 5.1%, 6.2%, 11.8%, 19.2% and 34.1% in Metropolitan governorates, Lower Urban, Lower Rural, Upper Urban and Upper Rural regions respectively1. But poverty in 2002 is estimated to have risen to 20.4% in 2002. The overall poverty reduction in 1995-2000 masked deterioration in Upper Egypt, especially rural areas. Income inequality did not improve. (The UN Economic Commission for Africa, 2005).

5.1. Political commitment to poverty reduction

In Egypt, political commitment to poverty reduction is indicated by its involvement in the UN MDG process, incorporating poverty reduction in the Five-Year Plan 2002-2007, National Democratic Party's Declaration of 2004 on combating poverty, and adopting the program in the poorest 58 villages - lowest Human Development Index "HDI", Table 3. (UNDP, 2008).

Table 3. Inventory preference to approach the United Nations' Millennium Development Goal (MDG) No. 7: ensuring environmental sustainability. (UNDP 2008)

MDG 7 Indicator Index	Indicator
Indicator 27	Energy use (kg oil equivalent) per $1 GDP (ppp)
Indicator 28	Carbon dioxide emissions (per capita)
	Consumption of ozone-depleting CFCs (ODP tons)
Indicator 29	Proportion of population using solid fuels

6. Best practice: innovative approaches to sustainable resource management

While an increasing amount of resources are being directed towards the identification and assessment of potential renewable energy projects, far less has been done in the development of the institutional and corporate structures necessary for rural communities to effectively develop and manage such projects. In this sense, a consortium of rural development advocates may work

to develop new approaches to renewable energy development that give rural communities a substantive role and stake in these opportunities. Central to this effort is the need to formulate development partnerships between rural entities and consortiums of energy development entrepreneurs that have an explicit goal at the outset the building of local capacity for long-term energy asset management and ownership. The following presents a number of best practices in this area.

6.1. Establishing Renewable Energy Service Companies (RESCOs)

In Xinjiang Province of China, a major feature of interest in the "renewable energy service companies" model is defined as the capacity to offer clients the ability to have energy efficiency or delivery benefits with no upfront investment by the client. In this experiment, renewable energy service companies are able to cover all upfront development costs through using long-term energy service contracts with the client as collateral for the initial capital investments. Particularly in poverty settings, this feature may be an essential feature given the shortage of upfront capital in rural communities (The UNECA, 2005).

6.2. Solid waste as a resource

The mismanagement of solid waste is a serious and visible problem negatively affecting the public health in, and the natural resources of Egypt. For many years waste management has been undertaken in the context of inadequate policy and legislative direction and with insufficient financing and fiscal accountability. Solid waste is managed under the "cleansing" approach, that looks only remove the waste, without due regard to environmental and socioeconomic consequences of the Solid Waste Management (SWM). Attitudes to waste management are changing rapidly in the country and the GOE has made solid waste management a priority. The Ministry of State for Environment Affairs (MOSEA), in coordination with other relevant ministries and governorates, has prepared a national waste management program that envisions implementing an integrated solid waste management system across the country, together with the remediation of existing dumpsites (The UNECA, 2005).

6.3. Joint venture development companies

The US' Community Energy Systems (CES) has established a new round of energy development to take place, associated with renewable energy resources. Joint venture models provided valuable templates for similar efforts in both renewable energy resource development and new business ventures. Extensive

experience can be acquired from "Community Self-Reliance through Renewable Energy" principles initiated by the CES, (Fulgsang, 2001).

6.4. Decentralization and natural resource management in rural areas

One of the aims of decentralization is to increase public participation in local-decision making. The claim is that public participation, coupled with locally accountable representatives with real public powers will increase efficiency and equity in the use of public resources (Agrawal and Ribot, 1999). Shifting authorities to local governments would promote citizen voice at grassroots, and promote resource mobilization.

6.5. Combating rural poverty: investing in climate change

Estimates show that 0.5 meter Sea Level Rise (SLR) would lead to the permanent submersion of 1,800 km^2 of cropland in low land of the Nile Delta, and accelerate trend of desertification in the remaining land. This could lead to economic losses in excess of US$35 billion and the displacement of 2 million people, (Bayoumi, 2008). The need for tangible action to reduce carbon emissions and improve energy security is yet immediate; these evolutionary steps in technology are therefore needed with unprecedented urgency.

6.6. Civil Society Organizations (CSOs) to promote decentralization

Internationally, CSOs have shown they can play many roles in facilitating decentralized development. These roles can be performed simultaneously, or the CSOs can play each of those roles at different times. Among those roles are the following:

−Acting as vehicles for popular participation and mobilization and the extent to which they are successful in this influences the success of decentralization;

−Facilitating local planning and goal setting by potentially identifying local priorities and assisting in the allocation of local resources;

−Contributing directly to service provision;

−Mobilizing local resources;

−Defining and expressing local needs and demands;

−Ensuring greater responsiveness of local administrations to citizens' needs, especially the needs of the rural poor and the disadvantaged groups, (Bayoumi, 2008).

6.7. Smart growth: science, technology, and society

The concept of Smart Growth, which is expressed through various different terminologies in the planning profession; Good Growth; Sustainable Development being some of them, is driven by a single over-arching goal; to preserve and enhance the quality of life for the region's citizens. Good growth does this by promoting a sense of community in new and expanding areas while protecting the integrity and vitality of existing communities – thereby strengthening the region as a whole, Table 4. (Fulgsang, 2001)

Table 4. Comparison of three perspectives on science, technology, and society. Fulgsang, L. 2001.

	Science and technology shape society	Society shapes science and technology	Interactive approaches
Time	1950s-60s	1970s-80s	1990s-date
Definition of technology	Cause	Consequence	Cause and consequence
Independent variable	Technology	Society	Social group
Relationship of actor to technology	Beneficiary (or victims)	Negotiate interests	Seamless web
Role of policy	Protect or reject science and technology	Empower actors, create networks	Democratize
Power structure	Technological regime	Negotiations	Frames, discourses
Method	Study impact of technology	Follow the artifact	Follow the actor

6.8. Renewable energy the rural community of El Bassaisa, Egypt

El Bassaisa Community Development Association (CDA): Founded in 1983, El Bassaisa CDA's aim has been to lessen the negative consequences of traditional practices, and the use of non renewable energy sources, and to set up more efficient practices using renewable energy. An additional task has been to raise awareness over the importance of efficient and renewable energy. Biogas and solar heater technology has been introduced to a number of villages in Sharqiya governorate using college graduates trained in the techniques of installing and servicing biogas units, solar heaters, and solar cells, Figure 8. (UNDP 2008).



Figure 8. Al-Bassaisa village in Sharqiya Governorate.

7. Renewable potentials in Egypt – key drivers and key stakeholders

The general objectives of this new policy may include contribution toward the quality of life in rural communities and provide a stable local economy; reduce the degenerative impact on the environment; and establish appropriate incentives to promote community-based conservation and the sustainable utilization of rural resources as a means of alleviating poverty. The implementation of these measures necessitates a thorough study of budgetary resources. Considering the renewable energy potentials in rural Egypt, Karekezi et al. recommended focusing on biomass cogeneration, bio-ethanol, biogas, Bio-diesel, respectively. Traditional, improved, and modern biomass energy technologies are discussed in Table 5.

Table 5. Bio-energy in Africa: Three Categories. (Karekezi, 2007)

Development of Bio-energy Technologies	
TBTs → IBTs → MBTs	**Traditional Biomass Energy Technologies (TBTs):** Inefficient use of wood, charcoal, leaves, agricultural residues, animal/human waste & urban waste.
	Improved Biomass Energy Technologies (IBTs): Improved and efficient technologies for direct combustion of biomass such as improved cooking/ heating stoves and improved biofuel kilns.
	Modern Biomass Energy Technologies (MBTs): Conversion of biomass energy to advanced fuels/forms namely liquid fuels, gas and electricity.

7.1. Solar energy to promote rural development

Based on national studies conducted to determine the successful community models for Egypt, numerous types of proposed community that are able to collaborate on agriculture and technology have been recommended. The following types are particularly recommended by the Very Large Scale Photovoltaics (VLS-PV) Research Group for Egyptian deserts and villages' hinterlands: (1) collaborating on agriculture and technology; (2) economically sustainable community; and (3) self-supporting community (Kurokawa, et al. 2007). It fosters the developed model for promoting community constituents, units, forms, and their related studies, Figure 9.

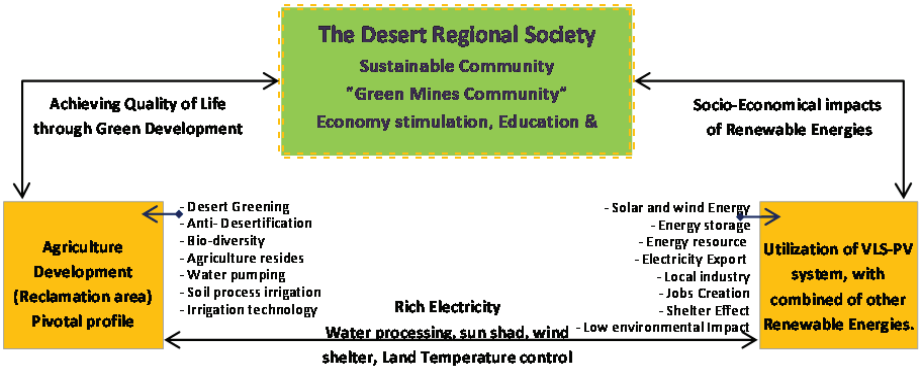


Figure 9. GrMC's Framework adapted to VLS-PV research studies. (Kurokawa, et al. 2007)

7.2. Key drivers for the bio-fuels' potential in the Egyptian rural areas

1. New revenue stream for agro-industries & farmers: Can realize a new & substantial revenue stream to agro-industries & farmers especially if using by-products of existing crops + strengthen backward linkages to agriculture.

2. Carbon finance: Cleaner options that reduce fossil fuels use & reduce greenhouse gas emissions thus attract carbon concessional finance.

3. Jobs: Energy crops for bio-fuels production can create job opportunities for rural communities in Africa arising from labor-intensive biofuels agriculture.

4. Energy security and diversification: Reduced dependence on imported fossil fuels and increasing energy security, (Karekezi, 2007).

8. The benefits of applying the INRM on the urban dimension in rural Egypt

−Integrated natural resources management is of prime importance for ensuring the sustainable use and conservation of human and natural resources. The study indicates the importance of integrating appropriate technologies into an improved management of all available resources to formulate a general consolidated framework. Such practice is intended to mitigate potential hazards and adverse impact to the rural environments, Figure 10.

−Focusing this integration on the management of resources in the typical Egyptian rural area may yield favorable results in terms of sustainable interventions with local ownership and leadership, and the mobilization of the capacity of stakeholders, particularly the ordinary citizens themselves.

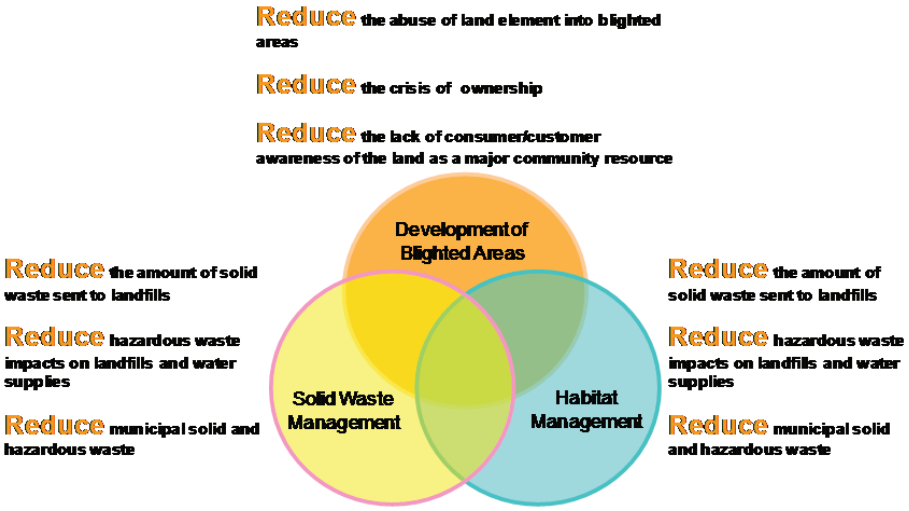


Figure 10. Potential benefits in developing blighted areas at the margins of urban and rural sites. (sheta, 2008)

–As a conclusion of the above data and criteria, the diagram in Figure 11 inspired from Sheta, SA (2008, pp. 219-20) attempts to combine the potential development of resource management criteria with mitigating instruments in the rural environment.

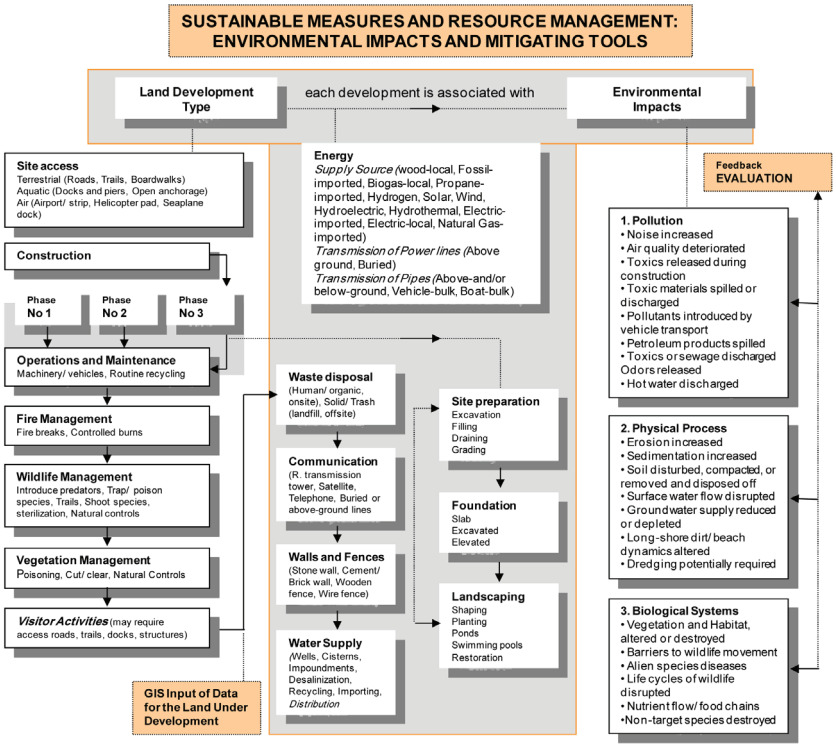


Figure 11. Linking the main resources to emerging sustainable measures of urban and rural development. (Sheta, 2008)

9. Conclusion and Recommended strategies

Based on the SWOT analysis, case studies, and best practice approaches discussed above, the following summarizes the recommended strategies to maintain sustainable resource management as a core theme in planning for the poor in the Egyptian rural areas:

9.1. Smart Growth principle for rural land use development

The fundamental principles of developing a smart, sustainable rural growth can be argued to embrace the following:

•Offering housing choices and equal opportunities;

•Taking advantage of compact development;

•Using existing assets;

•Adopting the mixed land use criteria;

•Preservation of open space, farmland, and natural beauty through natural

resources conservation;

•Encouraging attractive rural communities with quality design;

•Provision of a variety of transportation choices;

•Incentivizing the Urban Local Bodies (ULBs) to serve the poor;

•Participatory and consultative approaches to service delivery;

•Recognizing cities as engines of economic growth and poverty reduction is central to the concept of good urban governance;

•Integration of poor- participatory poverty assessment

9.2.Pro-conservation vs. pro-development strategies in rural develpment

Replacing the traditional pro-development strategies with an adoption of the pro-conservation strategy as discussed in Table 6.

Table 6. Pro-conservation vs. pro-development strategies in rural resource management.

Pro Conservation	Pro Development
Productivist space	Post productivist space
Place of consumption – tourists	Place of consumption – residents
Landscape	Social space
Vernacular house design	Modern' house design'
Landscape and heritage	Rural living and national identity
Positive urban imagery	Negative urban imagery

9.3. Adoption of innovative governance principles

Eight governance principles are recommended for sustainable resource management; each is defined and indicated for its potential executive implications.

Principle I: Legitimacy

−The question of legitimacy concerns who is entitled to make rules and how authority itself is generated, and is therefore a key factor in the effectiveness of governance arrangements, (Bernstein 2005, pp. 142-3).

Principle II: Transparency

−Transparency refers to the visibility of decision-making processes; the clarity with which the reasoning behind decisions is communicated; and the availability of relevant information about governance and performance in an organization.

Principle III: Accountability

−Where accountability is unrealizable through direct democratic involvement and is more informal, citizens' needs for proper access to information, meaningful

consultation, and for enhanced opportunities for active participation become more significant (Moore and Rockloff 2006).

Principle IV: Inclusiveness

−As well as embracing decisions concerning NRM issues and aspirations, inclusiveness should be practiced in design of the governance system itself. That is, reform processes seeking to decentralize governance should avoid 'top-down' imposition of institutional structures and instead adopt a collaborative approach that involves mutual engagement of all extant and potential governing actors.

Principle IV: Fairness

−Fairness refers to the respect and attention given to stakeholders' views; consistency and absence of personal bias in decision making; and the consideration given to distribution of costs and benefits of decisions. (Dovers 2005).

Principle VI: Integration

−Integration refers to the connection between - and coordination across - different governance levels; the connection between, and coordination across, organizations at the same level of governance; and the alignment of priorities, plans and activities across governance organizations. (Dovers 2005).

Principle VII: Capability

−Knowledge (and its management) is a key component of developing solutions to complex problems characterized by uncertainty, long time scales, multi-dimensionality, and diverse values. Solutions to such problems have to be informed by a broad range of knowledge sources including scientific research, on-ground experience, and traditional ecological knowledge (Berkes et al. 2000; Millar and Curtis 1999; Olsson and Folke 2001).

Principle IIX: Adaptability

−Planned, anticipatory and deliberate adaptation is development goal, Figure 12. Strong emphasis has been placed on the importance of anticipatory adaptation, i.e., incorporating dynamic analysis that considers how major stakeholders are likely to respond to climate change and adjust their behavior. Such an approach underscores the crucial importance of providing reliable information to stakeholders. (The IPCC 4th Assessment Policymakers Summary, Climate Change 2007: CCIAV).

−The executive criteria depicted in Figure 13, set up sustainable resource management among the major criteria discussed above, as a principal potential to reform sustainable planning techniques for rural areas, considering the extent to which the program targets may become mandatory.

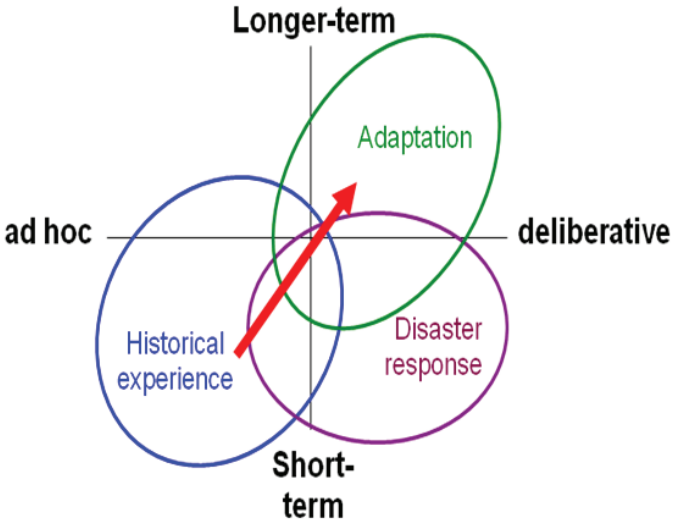


Figure 12. Moving from short-term, ad hoc, and reactive toward longer-term & deliberative adaptation (Source: the author)

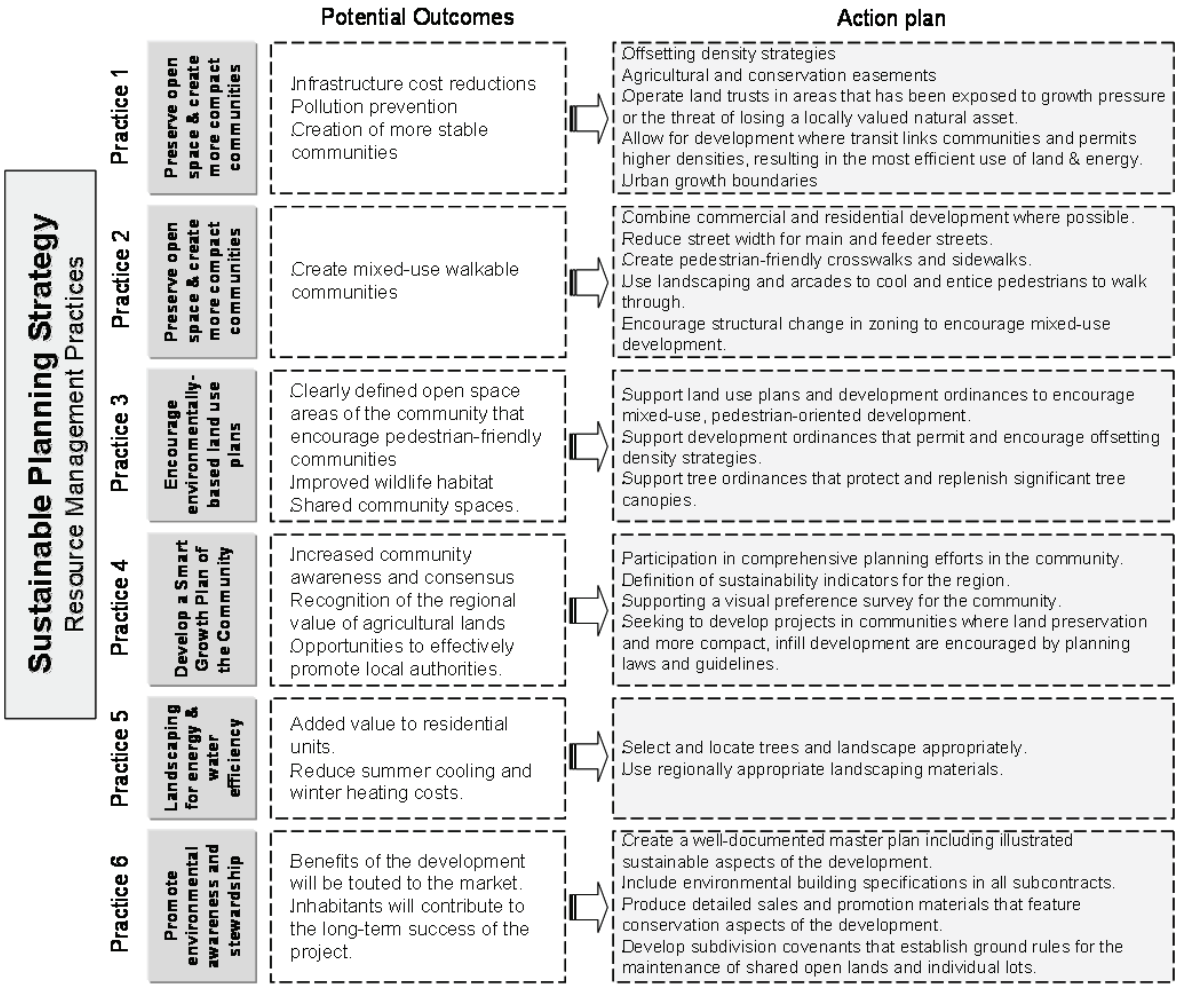


Figure 13. Sustainable planning strategy: practices, potential outcomes, and action plans.

10. Further research

More research and information outreach is needed to add power and dimensionality to existing tools and techniques of sustainability. Planning and executive authorities should be focused in further research effort to examine the efficiency of advanced tools and how they can easily accommodate information technology and continue to adapt to the evolving community expectations and environmental imperatives. Additionally, satellite and affiliated villages in rural Egypt should not be marginalized in long-term planning process, and thus have to be equally considered and studied as the main villages and local units.

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الإدارة المستدامة للموارد كموضوع رئيسي في التخطيط للفقراء – دراسة للمناطق الريفية بمصر

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الملخص:

اجتذبت قضية الإدارة المستدامة للموارد اهتمام العديد من الباحثين ومتخذي القرار للقيام بتقنيات تجريبية وتنفيذ مشاريع رائدة في الآونة الأخيرة، قدم بعضها وسائل وحلولاً مبتكرة لمشكلات تفاقمت عبر الزمن نتيجة الممارسات المهلكة للبيئة وتحديات النمو ومسقبل العمران عند التخطيط الاستراتيجي للمناطق الريفية، وتطرح الورقة البحثية قضية إدارة الموارد كموضوع رئيسي يلزم دراسته والإحاطة بأحدث وسائل التعامل مع أدواته كشرط لتحقيق الاستدامة في القرى المصرية، حيث تناقش المناهج الأحدث والتقنيات الأنسب والسبل الأقرب لدراسة القضايا ذات الصلة، مع العناية بوضع تدابير الاستدامة في كافة مراحل التخطيط والتشريع والتنفيذ، كما تقترح قائمة من الأدوات التخطيطية لرفع مستوى التكنولوجيا والتقنيات الملائمة والمتوافقة مع المجتمع الريفي، وتوفير الكفاءة والحوكمة في إدارة كافة الموارد المتاحة بالمناطق الريفية، وذلك بدراسة أفضل الممارسات والمعايير التي أثبتت كفاءة عندما طبقت على مجتمعات مماثلة، مع التوصية بتنمية النسيج الريفي التقليدي، وتبني مؤشرات لرصد التطور في آليات إدارة الموارد، ومن ثم وضع الخطط والخطوات التنفيذية الملائمة لتحقيق الأهداف العامة على مدى فترة زمنية معينة، وتشير النتائج إلى أهمية دمج التقنيات الملائمة لمعايير الاستدامة وتكاملها من أجل تحسين الإدارة ووضع السياسات وتنفيذ البرامج، وتوصي بالتركيز على كفاءة وفاعلية إدارة الموارد في النهوض بالمناطق الريفية من خلال حشد قدرات مختلف الجهات الفاعلة وذات الصلة، وتنمية مهاراتها كوسيلة رئيسية لتحسين ظروف الحياة، وبخاصة في المجتمعات الأشد فقراً.