

Methods for monitoring and evaluation and their adaptation to urban agriculture

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1. Introduction

Monitoring and Evaluation (M&E) of urban agriculture (UA) is crucial in assessing outcomes of UA related projects or policy interventions, as well as changes in UA itself.

The challenge is how conventional M&E methods and indicators, generally used for rural agriculture, can be adapted to the specific context and dynamics of UA.

The terms *Monitoring* and *Evaluation* (M&E) are often used in a broader sense than known from project work. Half of all resource papers reviewed for this topic presented 'M&E experiences' that consisted of surveys and analyses of biophysical, socio-economic or institutional UA issues without specific reference to any project or policy intervention. In these cases 'M&E' helped to describe UA situations and trends, e.g. the growing significance of urban agriculture for urban food security or the level of water pollution over the year. In the strict sense, this kind of 'M&E' would better be classified as *Situation Analysis and Diagnosis*. Nonetheless, this synthesis paper considers the repeated situation analyses of UA as also contributing to project M&E, such as when determining the impact of an external intervention.

The majority of cases that have been analysed dealt with one-shot evaluation activities. There were few examples demonstrating how M&E is interwoven into the project cycle, and how the individual M&E activities (e.g. baseline survey, process monitoring, impact evaluation) form a coherent, cumulative process of tracking change. For the purposes of this synthesis paper, M&E is viewed as:

...a set of activities and methods to track change in a given situation or system, and/or to assess project progress and impact. M&E can help us understand whether: (i) anticipated changes have actually occurred and (ii) if these are in fact the result of the intervention under review. Collectively M&E involves gathering information, data analysis, judging and making decisions. To analyse these changes, M&E should built upon an initial situation analysis and is likely to use related key parameter/indicators.

While there is already a well-established general literature on M&E in agricultural research and development (R&D), most of the reported experiences are based on the rural setting. In view of the contrasting characteristics often mentioned between rural and (peri)urban agriculture (Table 1), a distinct form of M&E in the UA context is expected. However, how far have UA projects taken up the challenge of adapting M&E for urban context? And does M&E require different framework/ approach, methods and tools, and/or indicators when applied to UA?

We drew some answers to these questions from the resource papers that shared experiences from Africa (5), Latin America (2) and Asia (3). Also serving as references were others papers that cut across countries/regions and those without specific reference to UA.

Table 1. Comparison of key features between rural and urban agriculture.

Features	"Rural" situation	"Urban" situation
Farm type	Conventional, 'textbook'-type	Unconventional, mobile and transient; partly over ground or without soil
Farming livelihood	'Farming' is a primary livelihood, engaged full-time	Farming often a secondary livelihood, engaged on a part-time basis
Farmer identity	Usually 'born' farmers	'Beginners', part-time farmers, in part migrants from rural areas, hobbyists
Community profile	Majority of community members engaged in farming	Percent of community members engaged in farming is highly variable
Stakeholders' views on importance of agriculture	Generally supportive	Contrasting views
Political, social, economic and cultural context	More homogeneous	More heterogeneous

<i>Features</i>	<i>"Rural" situation</i>	<i>"Urban" situation</i>
Land use	Generally stable for agriculture	Competing land uses (agricultural and non-agricultural)
Cropping calendar	Seasonal periods	Year-round growing of crops
Security of land tenure	Relatively high	Relatively low
Labour costs	Relatively low	Relatively high
Access to markets/inputs	Often far from market location	Closer to market location, favourable for perishable cash crops/products
Availability of research and extension services	More likely	Less likely
Policy support	High priority on policy agenda	Mixed; policies often vague or non-existent

2. M&E Planning

One source of variation among the resource papers is the range of M&E definitions and procedures suggested. There was consensus though on the need for careful and advanced planning of M&E. In table two, examples of procedures for M&E planning are presented, based on experiences on participatory impact monitoring in Sudan (Plastow and Pantuliano, 2001) and participatory monitoring and evaluation in the Philippines (Campilan, 2001)

Table 2. Steps in M&E planning: two examples

<i>Sudan Case</i>	<i>Philippines Case</i>
<ol style="list-style-type: none"> 1. What should be watched? 2. How can it be watched? 3. Who should watch? 4. How can results be documented? 5. What was observed? 6. Why these results? 7. What action should be taken? 8. How can impact monitoring be improved? 	<ol style="list-style-type: none"> 1. What changes need to be monitored and evaluated? 2. What information is needed to know such changes have occurred? 3. Through what data will the indicators be measured? 4. How will these data be collected? 5. When and how often will these data be collected? 6. Who will be responsible for collecting which data?

Meanwhile, Hovorka (1998) suggested a set of gender M&E guidelines for urban agricultural research projects. The guidelines are presented as questions which should facilitate the assessment how exactly gender analysis has been implemented by the project team during different phases of the project cycle and how effective this has been on enhancing overall project outputs. The list of questions, however, is not UA specific, thus open for modifications and expansion.

3. Participatory M&E

M&E is generally seen as a means to assess project efficiency, effectiveness, relevance and causality. Traditionally, its purpose is to promote accountability and transparency to outsiders. It is expected to yield information about project progress and accomplishments of targets, as illustrated by Table 3 from a homestead gardening project in Bangladesh (Talukder et al, 2001).

Table 3. Status of village nurseries in Bangladesh in 1999 (Talukder et al, 2001)

<i>Nurseries that</i>	<i>% (n=1200)</i>
Grow >10 varieties of vegetables	40
Produced >6 varieties of seeds in previous 3 months	24
Keep >6 varieties for seed production	15
Distributed seeds, seedlings and saplings in previous 3 months	45

These information are often collected to serve the needs of donor agencies, administrative and management entities and/or policy-making bodies. More recently, participatory monitoring and evaluation (PM&E) has emerged as an approach that seek to involve those which contribute to or are affected by the project (e.g. local people, collaborating organizations, program field staff) from planning M&E to using its results.

Being an internally driven process, PM&E is initiated and led by project insiders -- local people, project staff, collaborating groups, other stakeholders -- thus it is also often called *self-assessment*. When done by insiders together with external groups, it takes the form of a *joint* or *stakeholder M&E*. PM&E experiences reported by the resource papers follow either of these two modes. These were contrasted with the conventional externally driven M&E, which is initiated from the outside and exclusively conducted by those having no direct involvement or interest in the project (Figure 2).

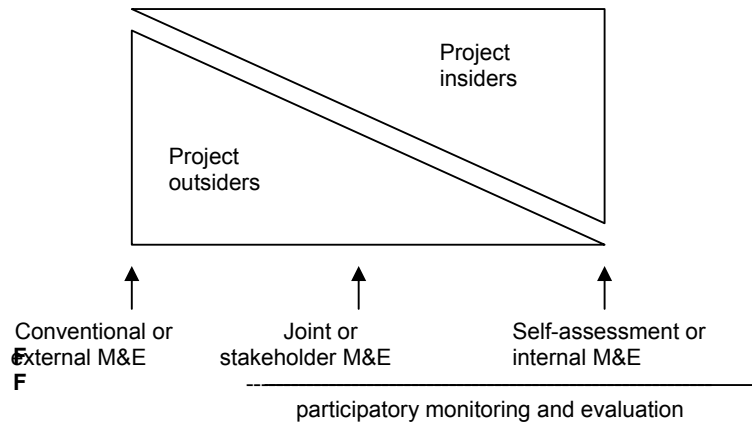


Figure 1. Project insiders as primary participants in PM&E.

PM&E emphasizes methods and tools that are more interactive, exploratory and flexible, e.g. participatory appraisals and ethnographic methods. Serving as examples of conventional and participatory M&E are two types of water quality assessment in peri-urban irrigation in Khumasi, Ghana. Cornish (2001) described how technical experts conduct water sampling and analysis, as compared with another project where school kids use simple test kits to monitor water samples that they collected (McGregor, pers.comm.)

It has been observed though that PM&E has high transaction costs; the emphasis on interactive communication among project stakeholders can make the process more time consuming. Not surprisingly, the most comprehensive examples of PM&E cited in the resource papers are those implemented by projects or institutions with relatively better funding support (e.g. Jacobi and Kiango, 2001; Drechsel et al., 2001).

Meanwhile, it is important to emphasize that PM&E is not meant to be a substitute for the more conventional approach. Rather, it seeks to enhance the overall effectiveness of M&E by capitalizing on the core strengths of the conventional approach while addressing in a more participatory way the interests of the different stakeholders. A home gardening project in the Philippines demonstrates the potential synergy between conventional and participatory M&E approaches (Table 4).

Table 4. Combination of conventional and participatory M&E approaches in a Philippines vegetable home gardens project (adapted from Boncodin and Prain, 1997).

<i>Evaluation Approaches/Activities</i>	<i>Purpose/Focus</i>
A. Conventional M&E	
1. Technical baseline survey on insect population dynamics	Entomological and ecological study to assess insect population dynamics
2. Technical monitoring on home garden biodiversity	Identification of crop species and assessment of mixes of crop species in home gardens
3. Nutritional impact study	Assessment of food consumption patterns and nutritional status of households
4. External project review	Terminal project evaluation
B. Participatory M&E	
1. Participatory needs assessment	Needs assessment and problem diagnosis related to home gardens
2. Participatory documentation of local knowledge	Documentation of ethno-botanical knowledge on home garden crops and their management
3. Participatory monitoring/garden mapping	Multi-season monitoring of crops grown in home gardens
4. Participatory technology evaluation	Participatory field trials to evaluate introduced crop species and management practices
5. Self-assessment workshop	Formative mid-project evaluation by project stakeholders
6. Community validation workshop	Analysis and validation of monitoring and evaluation results

4. Adapting M&E to the UA Context

Generation of feedback from project participants is widely considered to be a key role played by M&E. Feedback is particularly crucial in UA projects as they seek to accommodate the dynamics of agricultural systems in a (peri)urban setting. The multiple aspects of change that is intrinsic to UA affect both the relevance of objectives initially set, and consequently the M&E indicators or methods chosen. This dynamic nature of UA is an additional justification for a more participatory, process sensitive approach (Prain, pers. comm.).

Based on the empirical cases presented, it was generally observed that M&E methods and tools widely used in rural agriculture tend to be sufficiently generic for application in the UA context. Instead of calling for major methodological adaptations, the resource papers stressed practical guidelines to enhance M&E's sensitivity and relevance to UA's socio-political and agro ecological milieu (Table 5).

Table 5. Emerging M&E challenges in UA projects

<i>UA Features</i>	<i>Suggested Guidelines for M&E</i>
Unconventional farming systems	Identify indicators and units of measures for unconventional farming systems in UA, since those used in rural agriculture may be inappropriate or inadequate to Since UA is often mobile/transient, anticipate that it can be a "moving target" for M&E
Site proximity and accessibility	Budget project resources more efficiently because proximity and accessibility of UA sites cut travel time and costs
High number of stakeholders	The larger number of stakeholders in UA requires exerting more effort to seek them out for their inputs to M&E Examine how stakeholders' competing land use objectives affect achievement of UA goals and targets
Environmental costs	The potential trade-offs between economic benefits and environmental costs require that M&E integrates a key environmental dimension in evaluating project impact
Multiplicity of agricultural and non-agricultural livelihoods	Factor into the impact analysis the contribution of non-UA livelihoods
"Weak" identity of urban farmers	Exploratory phase required to identify UA farming population and/or select sample Motivate farmers to set aside time for participating in M&E Negotiate with farmers regarding incentives for possible opportunity costs of their participation

<i>UA Features</i>	<i>Suggested Guidelines for M&E</i>
"Urban farmers' often marginalized and unorganised	Capitalize on M&E as processes for empowering and mobilizing urban farmers
UA intertwined with broader urban development issues	Anticipate that UA project and M&E could be dragged into conflict situations Cultivate trust and confidence among urban farmers who could be suspicious of any hidden agenda for M&E
Complex land tenure arrangements	Anticipate that urban farmers capacity to participate can be constrained by their limited rights over land/resources Seek (in)formal permission or facilitate consensus on the use of a disputed land/resource
Limited or non-existent research and extension services	Collaborate with other organizations/agencies (NGOs, universities, lobby groups) that may have indirect interest in UA
Policy support	Orient M&E towards collecting adequate "hard" data often required by policymakers/administrators

For example, a joint UA project by the Kumasi University and IBSRAM has used PM&E methods that are comparable to those in rural agriculture projects. PM&E workshops and farm visits were organized using a variety of PRA methods, including a farmer self-analysis of changes in their knowledge, attitudes, skills and aspirations (KASA) in view of the introduced technology (Drechsel et al., 2001). Similarly in Dar es Salaam, Tanzania, exercises for drawing a ward profile and transect walking allowed participants, especially ward officials, to acknowledge the magnitude of small-scale urban agriculture activities (Jacobi and Kiango, this volume).

On the other hand, PRA tools may be incompatible with the cultural and political environment in certain UA communities. Gabel (2001) reported that in Harare, Zimbabwe, there are limitations to the use of participatory mapping tools for determining the geographic coverage of UA. As in many cases, UA is not a legal activity per se, and farmers felt uncomfortable mapping their fields. This implies that in cities where UA exists at the edge of legality, more formal/structured methods are useful in order to generate quantitative, technical information that are more familiar and acceptable to urban government leaders and policymakers. Among these could be the use of GIS to map green urban spaces and large-scale surveys to determine UA contribution to urban food demand.

5. M&E Indicators

Indicators are key parameters to show and measure changes. The resource papers however cautioned against the use of standardized indicators from rural agriculture, without first examining their appropriateness for UA.

Firstly, the selection of M&E indicators for UA can be daunting since agricultural activities are closely interwoven with the complex system of livelihood and food security strategies of urban households. An output indicator, for example, such as 'increased backyard production of food' cannot be assumed to automatically improve household food security or better diet; households may sell the food products and use the cash income for other purposes.

Similarly, a food consumption survey may not reflect urban reality if it ignores food supply from street kitchens and vendors, at least for the highly mobile working sector of the urban population.

Secondly, 'conventional' units of measures for rural farming systems may not be valid for the more 'unconventional' systems of UA (see Table 1). For example, measuring UA coverage in terms of hectareage will exclude a significant part of UA done in containers, rooftops and hydroponics systems. Another example is the 'per capita' unit. In some cases it might be more appropriate to refer to the urban 'night' population, in contrast to the 'day' population that includes people of working age who commute in and out of the city on a daily basis.

Thirdly, formulation of M&E indicators suffers from definitional and boundary-setting problems that plague UA in general. *Fundamentally different approaches to determining the size of especially the peri-urban area remain, although a related framework of different methods has been tested (Adam, 2001).* As long as these approaches are not homogenised, it becomes difficult to compare M&E data between different project cities.

Nonetheless, those seeking appropriate M&E indicators for UA can make use of existing technical indices/levels for various aspects of UA. For example, the widely accepted *Safe Minimum Standards* can be used as M&E indicators for water, soil, food, air quality. With the potential trade-offs in UA between economic benefits and environmental costs, a cost-benefit framework, which integrates farm economics with an economic environmental impact assessment, is essential (Moukoko-Ndoumbé, 2001). If intangible values are of concern, contingent valuation methods and indicators (such as willingness-to-pay) will be more appropriate (Nugent, 2001).

Some resources are now available for those seeking guidance and support on M&E indicators for UA. To facilitate the identification of appropriate indicators and to allow harmonization of assessments, international indicator databases have been established, such as UNDP's Global Urban Indicators

Database (www.urbanobservatory.org). The database was established for monitoring the implementation of the Habitat Agenda, allowing a more systematic appraisal of urban problems (e.g. pollution indicators), developments (e.g. land prices), and impacts of policies. For its part, UMP-LAC is seeking to integrate UA in the Urban Indicators Programme. In Lima, Peru a generic set of UA indicators is being pilot-tested to evaluate external interventions (Dasso, 2001). Such set of indicators however require flexibility as UA project objectives can vary significantly between different cities and countries.

6. Conclusions

We agree with Nugent (2000) who, in analysing UA case studies from different countries, found that they are extremely variable in their sampling methods, scope and presentation of data. The same can be said about the M&E resource papers being reviewed. One reason for the diversity might be that the complexity of the UA attracts researchers from a far larger range of disciplines than for rural agriculture.

We do also agree with Perez Vasquez and Anderson (this volume), that most UA studies are descriptive and based on surveys. This is especially common in M&E papers using a more conventional M&E approach. In fact, the case studies available show that there appears to be limited need for new M&E frameworks or procedures for the UA context. On the other hand, there is much evidence that the urban situation requires more thoughtful, dynamic and participatory approaches especially when R&D interventions are going to interest or affect different stakeholder groups. The challenge is then to explore how known M&E tools and M&E indicators can be best adapted to the specific UA context and will deliver the data and information needed for the various stakeholders interested in the assessment. A significantly high level of sensitivity appears necessary.

Box 1. Open questions and challenges to be addressed in a future UA E-conference.

- ◆ We are looking for more case studies of conventional and participatory M&E approaches.
- ◆ We are especially interested in examples emphasizing the adaptation of M&E. frameworks, methods, tools, or indicators to the specific context and dynamic UA.
- ◆ In particular we are interested in indicators used for intangible impacts of UA, such as women empowerment and capacity development.

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