

Periurban agriculture is confronted with several interrelated issues, which are linked to increasing population and rapid urban growth. A major concern is the increasing conversion of agricultural land for housing development vis à vis the need to produce sufficient food on a sustainable basis to satisfy the increasing urban demand.

From Video "Urban Agriculture", RUAF 2001



# Identifying Priorities for Technology Development

In the face of dwindling agricultural land, sustainable food production on intensive basis can only be achieved through the development and adoption of improved land management technologies. However, although technologies for appropriate land management are available, technology uptake has not significantly increased in smallholder farming communities. The reasons include:

- ❖ Failure of the technology in addressing the requirements of the complex and diverse socio-economic conditions under which smallholder farmers operate (Preuss and Steinaker 1995, Mokwunye et al. 1996);
- ❖ Failure in recognising local knowledge and promising soil management practices as a basis for developing or selecting improved technologies;
- ❖ Lack of participation of farmers in the technology development, monitoring and evaluation processes; and
- ❖ Inadequate extension services.

In such complex situations, a holistic approach is needed,

which is flexible and in which opportunities and constraints of several actors are central. On the other hand, accommodating socio-economic conditions and local knowledge in the research process requires farmers to actively participate in the research priority setting and planning, design of experiments and trials, review and interpretation of results and monitoring and evaluation. In this regard, participatory technology development (PTD) is relevant both in the development and selection of appropriate technologies and in the achievement of greater adoption (Mokwunye et al. 1996, Bechstedt 1996a).

The full paper (available at [www.ruaf.org](http://www.ruaf.org)) presents a case study in which various participatory methods were used in research priority setting and planning, accommodating local knowledge in the development and choice of appropriate technologies and monitoring and evaluation. The methods used were Participatory Rural Appraisal (PRA), SWAP (Successes, Weaknesses, Aims and Problems) and Participatory Monitoring and Evaluation (PME). This article will focus on SWAP, which elsewhere is referred to as SWOT (Strengths, Weaknesses, Opportunities and Threats).

## THE CONTEXT

The study was carried out in the context of the IBSRAM (International Board for Soil Research and Management) AFRICALAND Management of Upland Soils Project in collaboration with the Faculty of Agriculture, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana.

## RESEARCH ACTIVITIES AND TARGET GROUPS

The research activities consisted of socio-economic surveys, participatory rural appraisals (PRA), site selection and characterisation, farmer selection, on-station and on-farm experiments as well as participatory project/trial monitoring and evaluation (PME). The target group, comprising smallholder farmers within the peri-urban villages of Kumasi, fully participated in all the research activities starting from research priority setting to monitoring and evaluation. The research team that conducted the studies were multidisciplinary (agronomists, soil scientists, socio-economist, rural sociologist, agro meteorologist and extensionists from the Ministry of Food and Agriculture).

## RESEARCH PRIORITY SETTING AND CHOICE OF TECHNOLOGY OPTIONS

During the inception of the project, there was a need to assess the general situation and needs of the farmers in the target districts. This was to initiate the first stage of participatory planning of project activities. Consequently, PRA studies, particularly SWAP (Waibel et al. 1995 – see the box), were carried out in two peri-urban villages near Kumasi in the Ashanti Region of Ghana. Semi-structured interviews with open-ended questions were used to elicit information from the participants. About 65 respondents within the environs of Akrofuom village were interviewed including key informants such as chiefs and assemblymen, representing the community at the District Assembly. In the second village

**Charles Quansah**

*Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana,*  
✉ [crop-ust@africaonline.com.gh](mailto:crop-ust@africaonline.com.gh)

**Samuel Asante-Mensah**  
*KNUST, Kumasi, Ghana*

(Kotei) about 50 participants attended the SWAP workshop.

Soil fertility was recognised in the farming community as a major problem. During the SWAP analyses, farmer-collaborators were identified, and field trials of mutual interest discussed. Farmers reported their experience with applying poultry manure on vegetables and the yield increasing effect. It was further mentioned that weed residue left on the soil may enhance crop performance. According to farmers' suggestions, trials with poultry manure and (for comparison) mineral fertiliser, were recommended under additional consideration of weed residues as initial organic input.

### RESULTS PRODUCED BY USING THE SWAP METHOD

The SWAP was found to be an effective tool for:

- ❖ assessing the general situation of the locality and prioritising farmer felt needs in the shortest possible time;
- ❖ identifying the complex constraints to farming and other activities of the communities to serve as the basic input to problem-solving oriented research;
- ❖ using past mistakes or weaknesses constructively as learning processes;
- ❖ promoting participation by the community in the discussion of their common problems with the aim of finding solutions to them; and
- ❖ promoting the self-help spirit and initiative of the community and affording them the opportunity to participate in the planning, execution, and monitoring of research activities. This is a prerequisite to the adoption and sustainability of improved technologies.

### CONCLUSIONS

Participatory Rural Appraisal methods, particularly SWAP, can be used in research priority setting, design of experiments/trials and accommodating local knowledge and the complex socio-economic conditions of smallholder farmers in the development and choice of appropriate land management technologies in periurban areas. Involvement of both the farmers and the Extension Directorate of the Ministry of Food and Agriculture in all aspects of technology development, design of experiments, monitoring and evaluation, facilitates the institutionalisation and mass dissemination and adoption of the innovation.

### The SWAP Method

SWAP is a participatory rapid appraisal method suitable for assessment and self-evaluation. The following elaborates the steps in its application.

#### Preparation

❶ The interviewers single or in pairs, hold discussions with some villagers in their places of work. They give a first impression of the situation in the village and then concentrate on perhaps three major activities of the farmers. ❷ A workshop is arranged with a relevant section of the target group. A moderator, assisted by one or two persons (perhaps extension workers), writes farmers' answers possibly in the local language on cards and later translates them into English. In the discussions only farmers are permitted to talk, others are given their chance later.

#### Determining the main successes and weaknesses

❸ Farmers are asked to describe and discuss their successful activities within the subjects of discussion, which are listed on green cards. When the relevant successes have been named, the moderator again reads them to the farmers for their confirmation or alteration. ❹ The weaknesses contained in successful and other relevant activities are similarly listed, but on red cards. At the end, these are also read aloud by the moderator for confirmation or alterations. ❺ The weaknesses are then divided into those which are largely due to external factors (and cannot be influenced by the participants), and those which can be influenced. Three or four clusters are thus formed (in some workshops there may be more parties involved). The method will continue by concentrating on the clusters, which are within the action frame of the parties of the workshop.

#### Promoting initiatives and eliminating weaknesses

❻ Each of the clusters of weaknesses, which are within the influence of the participants, are then grouped into not more than the five most important ones. Asking each of five people from the group to identify the most important weakness can do this. ❼ Actors who may be able to eliminate the weaknesses are also identified. The discussed solutions are written on the back of the weakness cards and read aloud. It may be considered as the first planning step to alleviate the recognised weaknesses. This or the next point will be the end of the meeting. ❽ The weaknesses identified for elimination will be further discussed in another meeting so that they can be eliminated by new initiatives. Together with some of the participants the actors considered able to alleviate the weaknesses draw up a plan for how to overcome them in the near future, including a timetable. ❾ Alleviation of the weaknesses proceeds and is finally assessed by the participants of the workshop.

#### REFERENCES

- Asante-Mensah S, Drechsel P and Agyiele LA. 1998. KASA changes - An example for participatory impact assessment at farmers' and NARES level. In: Drechsel P and Gyile L (eds), On-farm Research on Sustainable Land Management in Sub-Saharan Africa: Approaches, Experiences, and Lessons, IBSRAM Proceedings No. 19 (Bangkok: IBSRAM), pp 215 - 221.
- Bechstedt HD. 1996a. Twelve reasons to favour participatory technology development (PTA) over transfer of Technology (TOT). *IBSRAM Newsletter* 41: 6-7.
- Bechstedt HD. 1996. Introduction to participatory monitoring and evaluation (PME) in on-farm research - a training workshop report. *The management of upland soils (IBSRAM AFRICALAND)*. Network Document No. 21. Bangkok, Thailand: IBSRAM, pp 121-142.
- FAO. 1990. *Agricultural Extension - A Reference Manual* (2<sup>nd</sup> Ed.) Rome: FAO.
- Drechsel P, Quansah C and Penning de Vries F. 1998. Stimulation of urban and peri-urban agriculture in West Africa - Characteristics, challenges, and need for action. Paper prepared for the IDRC/CRDI Workshop on the Contribution of Urban Agriculture to Food Security in West African /Cities, Ouagadougou, Burkina Faso, 15-18 June.
- Drechsel P and Quansah C. 1998. Sustainable land management with alternative fertilizer. A successful approach of IBSRAM in Ghana. Proceedings of the 16<sup>th</sup> World Congress of Soil Science in Montpellier, France, August 1998. Montpellier: International Society of Soil Science/CIRAD (on CD-ROM).
- Mokwunye AL, de Jager A and Smaling EMA (eds). 1996. Restoring and maintaining the productivity of West Africa soils: Key to sustainable development. *Miscellaneous Fertilizer Studies* No. 14. Lome, Togo: International Fertilizer Development Centre of Africa.
- Preuss HJA and Steinaker G. 1995. Promoting a participatory approach within national agricultural systems. *Agricultural and Rural Development* 2: 59-62.
- Quansah C, Drechsel P and Lefroy RDB. 1997. Peri-urban interface agricultural production systems: Soil fertility issues. In: Gregory PJ et al. (eds), *Integrated nutrient management on farmers' fields: Approaches that work* (Reading, UK: IFID/NRI/University of Reading, Occasional Publication 1), pp 199-209.
- Quansah C, Safo EY, Kyei-Baffour N, Oteng R, Bakang JA, Adams C and Asare E. 1996b. The social, demographic and economic setting of rural settlements around Kumasi, Ghana. *The Management of Upland Soils (IBSRAM/AFRICALAND)*. Network Document No. 21. Bangkok, Thailand: IBSRAM, pp 55-78.
- Waibel T, Kirchner T and Beier M. 1995. Participatory Appraisal and Evaluation for Agricultural Research and Extension. A participatory Training Course. Kumasi, Ghana: IBSRAM/KNUIST.