A typical phenomenon of urban agriculture is its specialisation in perishable products. In Kumasi, Ghana, 90% of all lettuce and spring onions, and about 75% of the urban fresh milk consumed is produced in the city (Cofie et al. 2001). Similar high contributions from urban agriculture are also reported from other cities in Sub-Saharan Africa (Armar-Klemesu 2000). Vegetables for home consumption are often produced in backyards but market production takes place on inner-city lowland areas, close to stream and drains or in the periurban environment. These farming systems provide some of the most output- and correspondingly input-intensive ones in sub-Saharan Africa.

Eight to eleven lettuce and spring onion harvests, alternating with three cabbage harvests, all in one year, are common for an urban farmer in Kumasi. To maintain this high production level on generally marginal city soils, access to water in the dry season as well as high amounts of seeds, manure/ fertilisers and pesticides are required. Increasing scientific attention towards the possible health hazards for consumers and urban farmers (Birley and Lock 1999, Mensah et al. 2001) has paved the way for local risk assessments and the promotion of organic farming alternatives. The Ghana Organic Agriculture Network (GOAN), for example, supports actively biological production methods, especially Integrated Pest Management (IPM) and compost. Other organisations, such as the International Water Management Institute (IWMI) started to look for risk-reducing options also beyond the farm level, i.e. at markets and households, as it became obvious that the adoption rate of biological farming methods remained very low among vegetable growers. In fact, although traditional or indigenous pest control methods are well known for staple crops, they could so far not convince urban farmers (1).

**WHY SO LITTLE PROGRESS?** Irrigated urban vegetable production is a highly market-oriented business with high revenue fluctuation depending on input availability, exact timing to meet the optimal demand/supply ratio, and best marketing channels. Farmers have to be flexible, innovative, but take care of their profit margin. It happens too often that the breakeven point will not be reached.

With respect to innovations, farmers are likely to adjust their production system only when returns to land and labour increase simultaneously (Ruben, 2001). In labour intensive cash crop production systems, like irrigated urban agriculture, it would be crucial that additional income derived from an innovation favourably compares to labour’s opportunity costs. As urban vegetable farmers spend an enormous time on irrigating their fields with watering cans (600-1600 liter per m² and year), any opportunity to rent motor pumps is greatly honoured. The opposite applies to labour-intensive compost-production as farmers working with GOAN reported.

Awareness of health risks, on the other hand, is low and does not appear to be a motivating factor to change practices. An example is the tomato production in Akumadan, Ghana, with high pesticide application and obvious health impacts at least on the farmers - from headaches to impotency (Mensah et al. 2001). Farmers do not only expose themselves to pesticides by not wearing protective clothing, etc., but also by opening pesticide sachets with their mouths (see photo) or testing appropriate pesticide mixtures by putting a finger in the cocktail and then in the mouth.

In this study area, IPM campaigns were accompanied with research that showed that tomato farmers using biological pesticides can obtain similar production figures than those using chemical pesticides (Appiah 2001). However, IPM decreased returns to labour and biologically produced toma-
The reasons for wanting to pay less were, for example, that there is little logic in paying more for a product, which is produced without costly inputs, or there is no reason to pay more for a product that does not look attractive. Consumers asked in another survey also revealed that farmers as well as traders could not be trusted for selling genuine “clean” vegetables (Nurah 2001). Moreover, although organic production might reduce farm-related health risks, Maxwell et al. (1999) stressed the potential of post-harvest contamination through food handling in markets as another source of health risk. An example of this is freshness on-market vegetables with contaminated water or the use of the same bucket of water over the whole day for sprayed and untreated food.

POINTS OF INTERVENTION

As the organic farming strategies applied so far in Ghana do not appear to be economically interesting, new projects have to first of all target the consumer to catalyse market demand. Awareness training supported by labelling and education/information campaigns (e.g. by the booths selling organic food) could be provided through electronic media, especially local radio and TV channels to reach households, while seminars might target consumer groups and associations. Secondly, market traders (in our study area mostly women) should receive training in safe vegetable handling to avoid post-harvest contamination. This, however, will require in many cases better market facilities - especially access to clean water and sanitation. Finally, a significant low awareness and/or ignorance of pesticide-related health hazards have been observed especially among periurban tomato farmers in Ghana, despite a range of acute and chronic poisoning symptoms (IWMI, unpublished). This will also require more attention though it might “only” result in safer pesticide handling and not in organic farming. Subsidies for organic pesticides, but even more importantly their reliable availability throughout the year, might facilitate their adoption. A framework for a Ghanaian Crop Protection Policy with emphasis on reduced health and environmental risks is available (Gerken et al. 2001).

CONCLUSIONS

The key constraint to organic farming seems to be lack of education or awareness at the consumers’ end on pesticide-related health risks and the correspondingly low market demand and economic incentive for the farmer. The question, however, is not only if the African consumer is able to perceive the advantages of biological production but if he/she can and will prioritise them in a situation of financial constraints (poverty), hunger and other more obvious health and environmental risks such as no or unsafe water supply, malaria or cholera.

<table>
<thead>
<tr>
<th>Willingness to pay</th>
<th>Accra (n= 994)</th>
<th>Kumasi (n= 838)</th>
<th>Tamale (n= 465)</th>
<th>Average pay more/less</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pay more;</td>
<td>48</td>
<td>56</td>
<td>52</td>
<td>+ 80 to 82%</td>
</tr>
<tr>
<td>Pay less;</td>
<td>41</td>
<td>36</td>
<td>42</td>
<td>- 43 to 50%</td>
</tr>
<tr>
<td>No opinion;</td>
<td>11</td>
<td>8</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1) Until now, Ghana’s tomatoes show Lindane levels of up to 500-1000 ppm while the No-effect level is 25 ppm (IWMI, unpublished).

REFERENCES

- Nurah GK. 2001. Quality labelling and marketing of organic veggies in Brong-Ahafo and Ashanti regions of Ghana. Final draft report to Ghanaian-German project for integrated crop protection (ICP), Plant Protection and Regulatory Services Directorate (PPRSD), German Technical Cooperation (GTZ).

Table 1: Household surveys on consumers’ willingness to pay for tomatoes produced without chemicals (Source: IWMI, unpublished)