

PEST AND PEST MANAGEMENT PARTICIPATORY APPRAISAL
Nanggung, West Java, Indonesia, 11-12 Sept 2006

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A participatory appraisal (PA) of the pest and pest management situation in Nanggung Subdistrict, West Java, was conducted as part of the SANREM CRSP SE Asia project, “Agroforestry and Sustainable Vegetable Production in Southeast Asian Watersheds”, on 11-12 September 2006. The main objective of the PA was to make a qualitative assessment of the situation to enable pertinent planning of research activities.

We focused on the vegetable crops which were shown by the recent baseline survey to be important in Nanggung, i.e., tomato (*tomat*), yard-long bean (*kacang panjang*), cucumber (*timun*), green beans (*buncis*), leaf onion (*bawang daun*, *Allium fistulosum*), and Chinese chive (*kucai*, *Allium tuberosum* or *A. odorum*). Some focus was also put on three vegetables/spices that TMPEGS had identified as having good marketing potential and therefore would likely be promoted during the project, i.e., *tebu telur*, *katuk* (*Sauropus androgynus*), and *honje*.

Baseline survey results also indicated that, in general, insect pests are more damaging than diseases on the vegetables grown in Nanggung. In addition, farmers lack information on pesticide application doses and methods.

The results from this appraisal are given below by crop. We spoke with approx. 18 farmers, either singly or in groups (see Appendix I for questionnaire), from three villages (Parakan Muncang, Sukaluyu and Kalongliud). In addition we observed the crops directly and took photos. However, due to the drought, vegetable crops were only in the field to a limited extent at the time of the appraisal.

Yard-long bean (*kacang panjang*)

This was the vegetable most extensively planted at the time of the appraisal, and 8 farmers provided information on it. There was a consensus that aphids (*bereng*) are the most damaging pest/disease on this crop; farmers said they can reduce yields up to 75-100%. Infestations can cover the entire plant and kill it. Other pests on yard-long bean include a leaf-footed bug (Hemiptera: Coreidae), Southern green stinkbug/*lembing* (*Nezara viridula*, Hemiptera: Pentatomidae), *gaung-gaung* (*Riptortus linearis*, Hemiptera: Alydidae), grasshoppers and a leaf caterpillar. A virus is also causing damage.



Aphid attack on yard-long bean

Pest control measures include application of synthetic pesticides (Decis, Curacron, Darmabas, Thiodan, Furadan, Rekor, Furacron), sulfur, lime, soap and kitchen ashes. These are all somewhat effective in reducing pest numbers. Infestations are too heavy for hand picking/cleaning.

Pest and disease damage makes it very difficult to sell the beans, in fact it is hard to even give them away. Damage is heavier on yard-long bean if planted under trees, because water drips from the trees onto the crop, which does not receive enough sunlight, according to some farmers. However, the effect may differ according to tree species (better to plant vegetables under *sengon* than jackfruit, one farmer said). On the other hand, another farmer felt that trees did not influence pest/disease levels on yard-long bean.

Tomato (*tomat*)

The only farmer we found with tomato in the field said his was a local variety called “*tomat sayur*” (“vegetable tomato”). He said this variety can be harvested ten times while common tomato does not grow well here and can only be harvested two times. The main pest is a caterpillar that bores into the fruit (which we did not see, but may be tomato fruitworm, *Helicoverpa armigera*). If he sprays (Sevin, Thiodan, Diazinon), the caterpillar only causes 5% yield loss, but with no insecticides this rises to 40%. If tomatoes are planted in locations with too many trees, the yield drops, according to the farmer. He uses a thick layer of straw mulch for the purpose of keeping the soil moist; he says the mulch has no effect on pests and diseases.



Fruit borer damage

Cucumber (*timun*)



The beetle pictured here, *Aulacophora similis* (Coleoptera: Chrysomelidae) appears to be causing the serious defoliation we observed on cucumber. One farmer said that this beetle (“*oteng-oteng*”) is the most damaging pest on cucumber, and can cause major crop loss. The next most damaging pests are *wereng coklat* (brown planthopper) and *wereng kuning* (yellow planthopper), which attack the fruit. The only pest control measures this farmer uses are to spray Decis and Refkol, which kill the pests in 10 minutes. He said pest damage reduces fruit size and makes it more difficult to market due to visible damage. Planting cucumbers near trees can increase infestation levels of *A. similis*, and the shading reduces yields, according to the farmer. His cucumbers were planted in an open area.



Defoliation on cucumber

Green beans (*buncis*)

A group of farmers said that the pest complex on green beans is essentially the same as on yard-long beans. *Riptortus linearis* is commonly seen on green beans.

Kucai (Chinese chive, *Allium tuberosum* or *A. odorum*)

Farmers said that there is only one significant pest or disease that attacks *kucai*, i.e., the *kuuk*, which is the larva of the scarab beetle, *Exopholis hypoleuca*. It attacks the roots while hiding in the soil. It can reduce yields up to 100%. The main control measure is to dig with a trowel while weeding and destroy the larvae encountered. The usual planting procedure is to weed, remove and kill the *kuuk*, and then plow and plant. A Furadan and fertilizer mix is also used to control *kuuk*. These control measures are only partially successful. *Kucai* grows better in open areas according to one farmer who is planting it extensively.



Tebu telur (egg cane)

Tebu telur has no significant pest/disease problems. It can be grown successfully near or under trees.

Katuk (Sauropus androgynus)

One farmer who grows *katuk* said all pests and diseases only reduce yields a total of 10-20% and the level of attack is the same whether the crop is grown under trees or in open spaces. Overall, *katuk* grows well under trees but better in the open. He does not use any control measures on pests and diseases. The most important pests are *bereng*, *wereng putih* (white leafhopper) and *ulat daun* (leaf caterpillar).

Honje

Honje has no significant pest or disease problems, according to farmers. A caterpillar feeds on the leaves, but farmers do not bother with controlling it. *Honje* is a very low maintenance plant in general.

Natural enemies

Most farmers had quite limited awareness of natural enemies (predators, parasitoids and pathogens that attack pests). Many predatory ladybird beetles (Coccinellidae) were seen on yard-long bean, probably due to the large number of aphid prey present. However, none of the farmers were aware that these were feeding on the aphids and some thought they were attacking the crop. One farmer thought that ladybird larvae were giving birth to aphids. When we explained that the ladybirds are “friends of the farmer” because they help control pests, the farmers were accepting of the idea. For the above reasons, we feel that training to help farmers and extension agents differentiate between pests and natural enemies would be helpful in reducing pesticide use.

When asked if there were animals or anything else that attacked pests or diseases on their vegetable crops, farmers named chickens, toads, frogs, lizards, and a leaf caterpillar (possibly referring to syrphid larvae, which look like caterpillars and feed on aphids). Two farmers were aware that pesticides kill natural enemies.



Natural enemies seen in yard-long bean fields

Conclusions

A group of farmers said that vegetables are sprayed once a week on average in Nanggung. While this is not heavy compared to many vegetable-producing areas in SE Asia, pesticide use could probably be reduced if farmers’ awareness of natural enemies was raised. In addition, pesticide applications could be better timed to bring about more effective control if farmers monitored pests and natural enemies and based their pest management decisions on their observations. Agroforestry systems also have the potential to help reduce pest and disease levels, but this needs to be thoroughly researched, especially since some farmers said that planting vegetables under trees increases pest or disease infestations.

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APPENDIX I. QUESTIONNAIRE.

Pest and Pest Management Participatory Appraisal Questions Nanggung, 11-12 Sept 2006

Name of Kecamatan, Desa, Dusun:

Farmers' names, gender:

Which pests/diseases are most damaging to vegetables a, b, c...?
Hama atau penyakit apa yang paling rusak tanaman _____?

How much does each reduce the yield of each vegetable?
Berapa banyak _____ mengurangi hasil tanaman _____?

What control measures do you use for each?
Cara pengendalian apa yang dipakai untuk _____?

Do these control measures work?
Apakah _____ berhasil?

Does pest/disease damage make it more difficult to market vegetable produce?
Apakah lebih sulit menjual _____ kalau ada kerusakan hama/penyakit?

If you plant your vegetables near trees do pest/disease attacks get heavier or lighter?
Kalau tanam sayur dekat pohon-pohon, apakah serangan hama/penyakit jadi lebih berat atau lebih ringan?

Are there animals or anything else that attack pests/diseases on vegetables?
Ada binatang atau apapun lain yang menyerang hama/penyakit sayuran?

Which of these "pest enemies" attack which pests/diseases?
"Musuh hama" apa yang menyerang hama/penyakit apa?

Does anything that you do help or kill these "pest enemies"?
Bapak/Ibu lakukan apapun yang membantu atau membunuh "musuh hama"?

Can we look at your vegetable crops?
Boleh lihat tanaman sayur Bapak/Ibu di lapangan?