CHAPTER THIRTEEN
A QUICK SIGHTSEEING TOUR AROUND AKT5

The purpose of this exercise is to let you have a go with a good knowledge base, and see what can be done with it. For this exercise we are using the Atwima knowledge base[1], a knowledge base created to explore farmers' knowledge on soil fertility management, soil classification, weed management and cocoa shade trees in the Atwima district of Ghana.

Getting started:

1. Load the AKT program (5.0) onto your computer (follow the instructions 'How to Install AKT 5' at the front of the manual).
2. Load the file atwima.kb onto your computer.
3. Open the AKT program.
4. Press **OK** on the first screen and the main menu will appear with the options at the top left hand corner.
5. Select **KB** → **Open Kb** → atwima.kb
6. Press **OK** at the various messages that appear until the Welcome dialog box appears.

Welcome Dialog Box

Read the Welcome dialog box, to get an idea what the knowledge base is about. Press **Further Details** for further details about the knowledge base.
Press **Close** on each dialog box when you have finished reading the dialog boxes.

Press **Topics**. Then highlight in turn each topic hierarchy listed in the Topic Hierarchies dialog box. You will see in each new Topic Hierarchy dialog box that appears, all the topics which that particular topic hierarchy covers. For example, the topic hierarchy 'Fallows' contains the topics 'fallow length', 'fallows', 'fallows and soil types', and 'fallows on fertility'.

Question: what topics does the topic hierarchy 'Weeds' cover?

Press **Close** on both dialog boxes to return to the Welcome Memo and **Close** again to arrive at the main menu.

Sources

Go to the main menu and select **KB** → **Sources**. These are a list of all the sources interviewed for the knowledge base (No statement can be entered into the knowledge base, without the author of the statement being entered into the knowledge base first). Let us look at one of them. Highlight the name **Asmoah et al.** and press **Details**. A dialog box appears giving you the name of the interviewer, interviewee, sex of interviewee and date of interview. If you press **Memo**, it will give you any further details that the knowledge base creator felt to be important. Press **Close** on all three dialog boxes.

Topics

Return to the main menu and select **KB** → **Topics**. This gives you a list of all the topics in the knowledge base. Highlight **'Management actions'** and press **Details/Edit**. In the dialog box that appears you will see in the 'Boolean Search String' how the topic was created – it is a Boolean search string of all management actions – 'burning', 'clearing', 'cutting', 'harvesting', 'planting', 'uprooting', 'use', 'work'. If you press **Statements** at the bottom of the dialog box, a list of all the statements on management actions appear. There are 107 statements in all on that topic.

(You can try the same thing out with the topic **'Weed control'**.

[1] Frost, W. 2000. Farmers' knowledge of soil fertility and weed management in Atwima district, Ghana. WinAKT Knowledge base. University of Wales, Bangor.

Question: How many statements are there on weed control?)

As you can see 107 statements is an unwieldy number. To make better use of the knowledge we should look at it in smaller sections, which we will now do. Press **Close**, **Close** and **Close** again to get rid of all the dialog boxes.

Object Hierarchies

From the main menu select **KB** → **Object Hierarchies**. You now see before you a list of the object hierarchies in the knowledge base. (Object hierarchies are a way of sorting the knowledge, creating an indexing system of related objects.) Highlight **'tree'**. The Object Hierarchy dialog box for 'tree' appears. In the box on the left hand side, all the objects in the hierarchy are listed, on the right hand side you see the name of the object hierarchy and the immediately subobjects below.

Press **timber_tree** in the 'Objects in Hierarchy' list. You will see that it now appears in the 'Object' box with the super object (tree) above and the subobjects (odum, okoro, opam, wawa) below.

Press **View Tree**. This gives you the full hierarchy with all its objects and subobjects. Now press **Close** in both dialog boxes.

Formal Terms

Go to the main menu and select **KB** → **Formal Terms**. Press the downward arrow on 'Type' and see the different types of formal terms. Select **object**. The 'formal terms' list now gives a list of all the objects in the knowledge base. Scroll down and get an idea of the objects in the knowledge base. Highlight **nfofoa_kwae** and press **Details**. This gives you information about nfofoa_kwae which is the local name for secondary forest.

Press **Show Use in Hierarchies**. You will see that it appears in the object hierarchy land_types. Press **OK**.

Press **Show Use in Statements**. The 16 statements that appear are all the statements in the knowledge base that mention nfofoa_kwae. Under 'Diagram Selection Type' at the bottom of the dialog box press **All Statements**.

Introduction to diagrams

The diagram that you see before you will show you all the statements that can be represented diagrammatically, i.e. all causal statements.

Press the **Label Mode** button twice. This gives you the statements in full. You can make the statements more legible by dragging the nodes across the screen to separate them out.

Question: What are the immediate effects of burning nfofoa_kwae?

(If the script is too small, just press the **Statements** button to get a list of the statements then return to the diagram by pressing **Close** in the Statements dialog box).

Go to the main menu (top left hand corner) and select Diagram → Hide Diagrams. Maximize the Search Results dialog box again. Still exploring nfofoa_kwae, highlight statement 156 ('burning of nfofoa-kwae causes the trees log presence is positive') and press **Navigate** at the bottom of the dialog box. (The Navigate button gives you the immediate causes and effects of each node). A diagram willl appear with the statements nodes highlighted. The immediate effect of this statement is unhighlighted (rain runoff rate). There are no immediate causes of this statement. Select the Navigate button on the right hand side of the diagram screen and click the double arrow that appears over 'rain runoff rate'. Carefully drag sideways all new

nodes to reveal any further nodes underneath (you do this by pressing the left hand mouse button over the node and dragging the node away). Select **Navigate** once more and click on 'vegetation debris presence'. Continue to build up the diagram by selecting **Navigate** each time and clicking on one of the new nodes.

Question: What, according to this diagram, does 'vegetation debris burning' affect?

Go to the main menu and select **Diagram** → **Hide Diagrams**

Boolean Search

Go to the main menu. Select **KB** → **Boolean Search**. Press on the downward arrow on 'Display KB terms of type' and see the different types available. Select **object**. Select **'**asase_kokoo'. First press Details to see the term's synonym. Then press Close on the Formal Term Details dialog box.

Now press **Select** and 'asase_kokoo' will appear in the Boolean Search String at the bottom of the dialog box. Then press the **AND** button. Then select 'asase_tuntum' and press **Select** once more. (If you want to check the synonym for 'asase_tuntum', press **Details**.) Press **Search**. One statement will appear. It is the only statement in the knowledge base which includes both 'asase_kokoo' and 'asase_tuntum'.

In the Search Results dialog box press **Close**. In the Boolean Search dialog box press **Clear**. Now do the same thing again, selecting 'asase_kokoo' and 'asase_tuntum', only this time using **OR** instead of **AND**. Press **Search**.

Now you have 30 statements. This is because you have selected all the statements that include *either* 'asase_kokoo' *or* 'asase_tuntum'.

In the Search Results dialog box press **Close**. In the Boolean Search keep 'asase_kokoo' *or* 'asase_tuntum' in the Boolean Search String but this time press the radio button **superobject** in the 'Search Options' box so that it is highlighted in the same manner as **object**. Press **Search** once more. You will now have 157 statements because, besides statements using 'asase_kokoo' *or* 'asase_tuntum' you have also selected the statements related to the superobject of 'asase_kokoo' and 'asase_tuntum' ('soil').

Creating a topic

Staying in the Boolean Search menu, it is also possible to create topics through the Boolean Search String. Let us create a topic containing all the statements about red soils (asase_kokoo), all the statements about black soils (asase_tuntum) and all the statements about cocoa. Create a Boolean Search String with these three objects.

Question: should you put AND or OR in the search string?

Then in the box 'Name of new topic' enter 'soils_and_cocoa' and press **Save**. The topic details dialog box appears, showing the Boolean Search String that makes the topic and allowing you to write a description of the topic in the 'Description' box. Press **Save** once more (you should get a message saying that the topic has been saved).

Now go to the main menu and select **KB** → **Topics**. Select your new topic 'staple crops' and press **Select** and then **Search**. All the statements linked with that topic will appear. Press **All Statements** in the 'Diagram Selection Type' to get a visual idea of all the causal statements involved.

Closing a knowledge base and finishing off

Before you finish using the knowledge base you must save your knowledge base if you wish to save the changes you have made. Save is via the main menu, **KB** → **Save Kb** or, if you wish to keep both versions, **KB** → **Save KB as…**

When you have saved your knowledge base, close the knowledge base (**KB** → **Close KB**) and close AKT by going to the main menu **File** → **Exit AKT**.

ASSIGNMENT

Create two new topics exploring what women know about trees and what men know about trees. Compare the two knowledges and suggest reasons for the differences/similarities between them.

Big Hint:

Start off in the Boolean Search, selecting Sources. If you press Details for each source, you will see if the source is male of female. Link the sources together with OR, but link the 'tree' to the Boolean Search String with AND. (*Question: why is this?*). Remember to explore the subobjects of 'tree' as well.