

'THINKING IT THROUGH: USING DIAGRAMS IN IMPACT ASSESSMENT'

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Diagrams are familiar to many people through the increasing interest in participatory monitoring, evaluation and impact assessment². Participatory methods are an important part of any enterprise development impact assessment (EDIA) which aims to really capture the complexities of peoples' own aspirations and strategies, contexts and ways in which enterprise development programs or policies contribute to poverty reduction. Others may have come across mind mapping and concept webs as a student or from advocates like Tony Buzan³. As discussed below, diagram tools have a key role to play at many different stages and levels of impact assessment. They have the potential to considerably increase the usefulness and reliability of information and contribution to empowerment and capacity-building.

However, despite this potential, diagrams are often used in a superficial way which may mystify rather than clarify. There are a number of key challenges particularly when diagrams are to be used for rigorous impact assessment rather than just rapport-building or causal modelling:

- ⇒ How can diagram tools be made more rigorous in terms of qualitative analysis?
- ⇒ How can diagrams be used to collect reliable quantitative information and how can they be aggregated?
- ⇒ How can diagrams be recorded and reproduced in a form comprehensible to those who were not involved in producing them?
- ⇒ How can the process of using diagrams be made more empowering?

¹ Further details of using diagrams for gender analysis will be posted on the author's website by end July 2003 <http://homepage.ntlworld.com/mayoux>. This includes some worked through examples from diagrams to investigation design/questionnaires.

² In this paper the term 'impact assessment' is used as a shorthand for monitoring, evaluation and impact assessment. All these are understood as requiring substantial use of participatory action learning methods with the ultimate aim of improving practice and empowering participants. For an overview of participatory methods and the general principles of [Empowering Enquiry](#) see on this website.

³ Diagram methods are described in more detail in Bryant, J 1989 and Buzan, T 1995. They are widely used in some academic institutions like the Open University as an effective aid for student learning.

This paper significantly updates and expands an earlier paper of the same title and complements a number of other papers on this web site (see [Participatory Methods](#), [Empowering Enquiry](#)). It draws substantially on current work by the author and Kabarole Research and Resource Centre (KRC) in Western Uganda to pilot a methodology called PALS (Participatory Action Learning System) which uses diagram methods at all levels to link grassroots learning with programme decision-making and national level advocacy.⁴

Part 1 of this paper gives an overview of diagram types and general guidelines for addressing issues of analysis, quantification, participation and documentation.

Part 2 gives practical suggestions on ways of using the different diagram tools for enterprise development impact assessment at different levels.

NOTE: This document is an ongoing one and further contribution of tools for the web site or accounts of experience using diagrams would be very welcome.

⁴ L. Mayoux 2003 'Participatory Action Learning System: An Empowering Approach to Monitoring, Evaluation and Impact Assessment: Manual' Kabarole Research and Resource Centre electronic copies available from KRC krc@infocom.co.ug or the author l.mayoux@ntlworld.com. See also Kakyoo, S, Bahamuka, A and Mayoux, L 2003 forthcoming 'Participatory Action Learning System: Experience of Kabarole Research and Resource Centre, Western Uganda'

PART 1: OVERVIEW

SECTION 1.1: WHY DIAGRAMS?

Diagrams provide a universal language based on logical structures and relationships. Once tools are learned and common symbols developed, they can communicate information across language barriers. They are essential means of communication for people who cannot to read and write. They are also used in the boardrooms of multinational companies and lecture theatres of academic institutions. They provide a sophisticated and entertaining way of presenting very complex information which might take several pages to describe in words.

Diagrams can therefore be used at all levels of impact assessment:

- ⇒ Grassroots learning where diagrams provide a means for people with no or very low levels of literacy to contribute actively to discussions and have their ideas and contributions documented in a way which they themselves can also understand⁵.
- ⇒ Program level and researchers where diagrams provide a very useful shorthand for thinking through and documenting very complex ideas which are difficult to capture in conventional types of note taking.
- ⇒ Policy makers where diagrams provide an effective means of representing and communicating findings of research and assessment and focus for discussion of policy responses⁶.

Diagrams can also be used at many different stages of impact assessment:

- ⇒ Design of impact assessment: choice of indicators (!! Insert link to indicator trees), stakeholder analysis, causal modelling and development of hypotheses.
- ⇒ Investigation through participatory methods, qualitative interviewing with individuals and key informants, rapid quantification of key indicators and issues.

⁵ Issues involved in promoting use of diagrams by grassroots groups themselves see the paper on grassroots [participatory action learning](#) on this website.

⁶ Diagram methods have become extremely popular in business circles for example with the advent of Powerpoint presentations and developments in computer diagramming techniques. For arguments in favour of using diagrams at this level refer to any of Microsoft's software manuals!

- ⇒ Analysis of information either in participatory focus groups or by researchers to identify hypotheses about why particular patterns occur, possible ways forward and also limitations in the information collected and implications for any conclusions.
- ⇒ Dissemination of information in a clear and accessible form either in presentations or more formal reports.

Any of the diagrams discussed here can be re-examined at a later date in order to assess and measure change over time, their causes and implications.

Use of diagrams can not only increase the reliability and usefulness of information but also increase the contribution of impact assessment to an [empowerment process](#) through:

- ⇒ Awareness raising and grassroots involvement in issue identification and analysis.
- ⇒ Producing a clear comprehensible product from focus groups or interviews which can be recorded by the interviewer/facilitator but leaves a copy with the interviewee for future reference and use.
- ⇒ Increasing participation through enabling people with low or no literacy skills to communicate directly with programme staff and policy makers, providing the basis for more participatory decision-making and a grassroots-based advocacy process⁷.

These benefits are particularly evident where diagrams are used as part of participatory focus groups and workshops. Even where they are used on an individual level they provide a means of improving communication and understanding between researchers and informants through clarifying information and clarifying what has been understood. They can be used with children and make both interviews and focus group discussions much more fun and lively. This is likely to increase the interest of informants/participants in thinking about the issues and giving reliable information.

Until the recent and rapid developments in computer and imaging technology, recording and refining diagrams was somewhat tedious. However it is now possible to record diagrams in the field using digital cameras and download them to computers for filing or for further editing and refinement using diagramming or image editing software. This means that any hard copies can stay with the interviewees or participants. It also means that diagrams can be easily reproduced in their original or edited form for revisiting the information at a later date, or further investigation of particular issues. They therefore provide a much clearer and cost-effective means for taking notes and recording complex issues.

⁷ Issues in using diagrams and participatory methods for advocacy are discussed in more detail in a forthcoming paper on advocacy by the author which will be published on this website in September 2003.

SECTION 1.2: TYPES OF DIAGRAM

Different diagrams represent different types of logical relationship. Some of the best-known basic types are shown in Box 1. However innovation is a key feature of using diagrams. The range of adaptations and types of information which may be represented on diagrams of any one type is very wide. At the same time, any one question can often be approached using more than one type of diagram or sequence of diagrams. The diagrams discussed here only touch the tip of the almost infinite possibilities for inventiveness and ingenuity.

There is no one correct way of using diagrams. There will inevitably be tensions between the need for:

- ⇒ flexibility and openness to the complexity of the real world.
- ⇒ simplicity and clarity of the final representation to make it comprehensible to outsiders.

Most diagrams go through a process of first elaboration and exploration and then progressive refinement as particular elements and relationships are judged more important or more interesting than others in the light of evidence or logical association. This is likely to lead to many changes in both the elements represented and the ways in which the relations between them are depicted. In many cases a sequence of diagrams may be appropriate. One could for example show positive interlinkages. Another based on the same template could show negative interlinkages. Yet another could indicate sources of information and/or questions and gaps in understanding and so on.

BOX 1: SOME BASIC DIAGRAM TYPES

TREES which start from a trunk representing an issue or an institution like a household or community. Inputs are then shown as roots and outputs as branches.

Examples of use in EDIA: income and expenditure trees, cost/benefit trees, household decision-making trees, cause and effect trees, problem and solution trees, indicator trees.

FLOW DIAGRAMS, WEBS AND NETWORKS which show the complex interrelationships between different issues, objects or concepts. These are also often referred to as Mind or Concept Maps. These are really more complex forms of tree which show many rootlets and twigs, or relationship between different trunks. They can also be topographical maps where it is not the geographical relationship but the interrelations between things which are mapped.

Examples of use in EDIA: conceptual mapping and more complex indicator trees, causal modelling and more complex versions of any of the trees above, institutional mapping, [value chains analysis](#).

VENN OR CHAPATTI DIAGRAMS which show the common and distinct features between different elements represented as overlapping circles.

Examples of use in EDIA: stakeholder analysis, household decision-making, analysis of community or market associations and power relations.

DIAMONDS which show the degree of spread around an established norm or average.

Examples of use in EDIA: Identifying criteria for poverty, empowerment, 'success', entrepreneurial capacity and establishing distribution of a group of people (community, market, micro-finance group etc) according to these criteria.

MAPS which show the geographical locations of things like households, resources, markets and also add qualitative and quantitative information.

Examples of use in EDIA: baseline community survey of various criteria by household or individual, identification of programme participants at various levels and relationship to targeting, market maps, natural or physical resource and infrastructure maps.

ROAD JOURNEYS which chart a journey from point a to point b, generally over time. This may be a forward-looking journey to the future, or a backward looking one to the past.

Examples of use in EDIA: identification of the history and/or aims of an individual, group, project or community and the stages in moving towards those aims and possible opportunities and challenges and/or strengths and weaknesses.

MATRICES which show the relationship between two variables as a table with quantified values.

Examples of use in EDIA: access and control profiles, landholding patterns or economic activity by sex or ethnic group and tabulation of material from any other diagram types.

CALENDARS AND TIMELINES which show differences over time or through the year.

Examples of use in EDIA: seasonal patterns of income, resource availability, expenditure, activities, supply and demand of inputs or products. These can also be plotted against eg incidence of particular diseases, climatic variation.

WHEELS OR PIE CHARTS which represent the different proportions of different elements.

Examples of use in EDIA: to show relative proportions of income and expenditure used for different purposes and/or by different people within a household or community, relative profits from particular activities or input and resource requirements.

SECTION 1.3: GOING DEEPER: GUIDELINES FOR QUALITATIVE ANALYSIS

Diagrams are often used for raising awareness. Here diagrams do not need to go into such depth or attempt to be particularly rigorous. However in impact assessment it is generally necessary to progressively refine the original diagram or develop a series of related diagrams to show different dimensions of any hypothesis or findings.

Diagrams can be further developed in many different ways, as described in more detail for particular diagrams in Part 2. In most cases it is possible, and it will be necessary, to include the following:

- ⇒ Progressive refinement of categories and elements through using different types of symbol e.g. differentiating between different types of house or type of land ownership.
- ⇒ Disaggregation by gender and/or other stakeholder category: This can be done through either producing separate diagrams for each stakeholder, putting them on different sides or different columns or assigning different items to each through using different colours or lines.
- ⇒ Simplification through grouping together similar issues or ideas into one or linking them as categories and subcategories.
- ⇒ Indicating interrelationships through putting on arrows or other forms of links, showing types of boundary between elements through solid or dotted lines and boxes.
- ⇒ Prioritisation of particular issues, solutions and so on through showing differences in size, colour and line.
- ⇒ Adding notes or links to other diagrams.

This can be done in the field through copying final diagrams from exploratory forms in changeable materials like the traditional beans in the dust and board and chalk to a more permanent form on paper. The can also be further refined for filing and dissemination through using digital cameras and software as discussed below. It is advisable to make sure initial diagrams are big enough to allow addition of notes and quantitative information.

SECTION 1.4: ADDING IMPACT: GUIDELINES FOR QUANTIFICATION

Conventional research uses surveys to collect quantitative information. However using diagrams, it is often possible to collect information as reliably

but much more rapidly and in a way which makes the findings immediately accessible to everybody.

There are three basic dimensions of quantification which need to be addressed:

- ⇒ **Measurement**
- ⇒ **Counting**
- ⇒ **Aggregation**

Each of these presents particular challenges for diagram methods as it does for more conventional quantitative surveys and qualitative methods.

Measurement of absolute or absolute size or importance of particular elements e.g. levels of income, amounts of produce encounters the same problems as in conventional quantitative research measurement. As discussed in detail elsewhere even common indicators like increased income are difficult to measure because of conceptual problems and people's lack of reliable information ([see Selecting Indicators](#)). In diagrams it is often easier to crosscheck information, particularly when done as part of a participatory exercise. However it is obviously always necessary to:

- ⇒ **Ensure that information given is reliable.** In some cases information may be more reliable when given in a group than when given individually because it can be crosschecked and verified by other participants. In other cases, depending on the issue, people may be less willing to disclose sensitive information. Here it is necessary to introduce a topic in such a way as to encourage people to have an open discussion.
- ⇒ **Be very clear about exactly what it is that is being quantified.** For example it is very important to make it clear whether the questions refer to people's perceptions of size or relative size or importance of particular variables within the community, their own actual views or experience, actual knowledge of the actual incidence within the community and so on.

Counting or estimation of relative or actual numbers of people associated with particular elements also encounters similar problems to conventional quantitative methods. Here it may also be necessary to distinguish between people from different social groups: by gender, by ethnic group, by income level and so on. When assessing the numbers of people involved from different categories, there are a range of easy methods which can be used in a group meeting:

- ⇒ **Voting** by showing of hands with numbers then marked on the diagram.
- ⇒ An **energiser** which asks people to group themselves by particular characteristics to encourage them to move and change places as well as be counted.

⇒ **Voting** by secret ballot, using symbols and diagrams, can be used for more sensitive issues.

In both cases it is necessary to:

⇒ Be very clear about **exactly who is being represented** and participating: Systematic sampling is possible when using diagrams in qualitative interviews, but is often difficult in participatory methods. Participatory methods are frequently used to bring together different stakeholders in a specified location rather than as part of interviews in their own homes or workplaces. In this case those facilitating have much less control over who comes and who does not come and there is always likely to be an element of self-selection.

It is crucial with participatory methods to be aware of and record who is actually present, who participates in discussions and how this influences the ways in which information is obtained and/or decisions reached. There are ways of encouraging more equitable participation representative of groups from different backgrounds (see [Participatory Methods](#) and [Sampling](#)).

Aggregation of data from different diagrams is somewhat more problematic than in conventional methods, but largely due to the complexity of reality and the fact that this complexity will have to be filtered after rather than before collection of information. Judgements will have to be made about the equivalence of locally-identified indicators and representativeness of the participants who have not been purposively or randomly selected. The best ways of aggregating of data from different diagrams depends on the particular issue and diagram used. This is discussed in more detail in relation to each Tool below. However it is generally possible to:

⇒ **Assign and weight locally derived indicators** according to common broad categories. They can then be tabulated and quantified like any other type on non-numeric information.

⇒ **Identify representation of different broad stakeholder categories** and weight the responses accordingly.

However these judgements can be made much more reliably based on better contextual understanding through using diagrams, rather than being often rather arbitrarily based on the preconceptions (and possibly prejudices) of the investigators.

SECTION 1.5: SHOWING THE WOOD IN THE TREES: ISSUES IN DOCUMENTATION

One of the big advantages in using diagram methods is the potential for communicating across language, education and status barriers. People with little or no literacy and children can confidently explain their diagrams to

policymakers. Providing the diagrams are based on reliable and systematic information, they provide a very convincing means of rapidly communicating research findings which can interest very busy policymakers in reading a longer report.

However there are a number of important guidelines to follow:

- ⇒ **Always use a key:** One of the big advantages of diagrams is that symbols can be used as well as words. This means that they go beyond language groups and beyond literacy. Nevertheless, it is important to always use a key to show what the different symbols mean. It is also advisable to use symbols which are likely to have meaning for a wider audience. Where different types of line, colouring, shading and so on are used, this should also be systematic and put in the key. This is particularly important where many diagrams from different sources are going to be brought together for quantitative analysis or advocacy and lobbying. It is also important where diagrams are used for monitoring and evaluation over time and the people re-examining the diagrams at a later date may not be exactly the same people as those involved in the original diagrams.
- ⇒ **Always take notes on the process** as well as just producing a diagram product. If diagram methods are to be comprehensible and credible as evidence for outsiders e.g. in advocacy and lobbying it is important to make sure that not only the diagrams are reproduced, but that the process, meanings and analysis are also documented. This has been discussed at length in relation to participatory methods elsewhere on this website ([See Participatory Methods](#)).

It is also often useful to identify underlying concepts and shapes related to the issues concerned and putting a bit of artistic flair into the diagram so that it has a similar visual shape which will attract people's attention and make it memorable.

As discussed above, advances in technology have made more sophisticated uses of diagrams much more manageable in terms of time and dissemination costs. Recording diagrams with **digital cameras** has many advantages. The diagrams can be reproduced and filed quickly, leaving a copy with the originators. Any other related photographs can also be taken to supplement the diagram and substantiate some of the points. In computer applications these can actually be inserted into the diagrams for further visual effect. The diagrams can also be manipulated using imaging software as discussed below. There are a number of considerations, however, which need to be taken into account at the drawing and shooting stage if diagrams are to be photographed in this way:

- ⇒ **Use contrasting colours**, and keep colours to the minimum necessary. Use white rather than coloured paper or ensure that pen colours contrast well with the paper and with each other. Also make sure all pens are working properly producing thick lines and not running out. Otherwise it is difficult to both retain detail and reduce the file size sufficiently for e-mail or web site.

- ⇒ **Take at the highest resolution and best quality** your camera is capable of so that you can edit and magnify parts of the picture as required.
- ⇒ **Make sure light is even** across the image. Flash can produce difficult shadows which then are difficult to separate from the pen colours.

For editing diagrams and presentation there are now many possibilities summarised in the Box:

- ⇒ **Simple photo editing** for presentation of existing diagrams: to crop and improve the colour, sharpen etc. This can easily be done in almost any simple (and often free) photo editing package for export into Word, Powerpoint and other publishing and presentation packages. For lowest file size without losing too much detail:
 - 1) Increase the contrast and reduce the number of colours through using the contrast and hue controls or curves.
 - 2) Then sharpen the image (although this will not compress so much this is often necessary where images are a bit sketchy)
 - 3) Save as a GIFF file rather than JPEG.(The diagram tools used here are between 15 and 25kb each depending on number of colours).
- ⇒ **To edit diagrams** to make them clearer through changing colour of lines, changing shape, extract symbols for use on new diagrams etc. This is a bit more complicated and best done in diagram packages like Macromedia Fireworks or Adobe Illustrator. These enable full editing of bitmap images (produced by photographs) and their conversion into vector images (line drawings which take a much smaller file size and can be edited). Symbols and other elements can be exported as libraries of small GIFF images into Word and other diagram applications. This means you can refine and revise diagrams easily while still retaining the original symbols and imagery from the field.⁸
- ⇒ **To draw and edit your own new diagrams.** This can again be done in programmes like Word, or more easily for export as multimedia GIFFs in Fireworks or Illustrator. Here templates can be made, symbols put in libraries and used again and again.

⁸ Fireworks can also do simple animation and links with other programmes like Macromedia Flash.

⇒ **For more complex mind mapping and flow diagrams** two very good programmes are Inspiration and Mindjet⁹. This can also be done with the other software, but these enable you to very rapidly produce many related diagrams on any particular topic. Information is typed into and stored on one master diagram or web which can then be transformed into many different shapes and sizes with only a few clicks through global formatting and expanding and collapsing nodes to make the diagrams clearer in relation to the particular issues you are trying to present at that particular time. You can also again import libraries of symbols from any other source you have e.g. PRA exercises, photos and customise all the boxes, arrows etc and export to Word or as GIFF for use in Powerpoint or other multimedia applications. Inspiration is incredibly flexible and useful for many types of diagram. Mindjet is more limited to tree-type diagrams but is available also for Palm Pilots.

SECTION 1.6: DIAGRAMS AND EMPOWERMENT: INSTITUTIONAL CHALLENGES

As discussed above, diagrams help to facilitate freer and more equal communication between people at very different backgrounds and levels. Grassroots groups involved in the KRC piloting in Uganda said that your practice of using diagrams had considerably increased levels of meaningful participation in discussion and people were also able to better remember the outcome of such discussions.

Diagrams can be used as an integrated part of qualitative methods in Empowering Inquiry to help clarify and feed back information to people being interviewed. Diagrams cannot however be taken as a panacea for bad interview technique. It is important that the other guidelines for [Empowering Inquiry](#) and use of [qualitative methods](#) are followed.

Equally when using diagrams in participatory methods empowerment cannot be taken for granted and certain procedures are advised in order to ensure that participation takes place.

- ⇒ Participatory energiser: Begin with some sort of energiser which encourages people who might not otherwise speak to come forward.
- ⇒ Everyone is respected and equal: Make it clear to everyone that everyone's word is to be valued and respected, particularly the views of those who may be more disadvantaged than others in the group. This includes women, illiterate people and also men if they are in a minority and not in leadership positions.

⁹ A free trial download of Mindjet is available from <http://www.mindjet.com> and for Inspiration from <http://www.inspiration.com>

- ⇒ Passing the stick: Introduce some sort of tool like a stick, or some groups prefer a banana or other object to represent a microphone. It is only the person holding this tool who is allowed to talk. It is then possible to ensure that everyone has a turn to hold the stick and limits on the numbers of time or length of time anyone can hold it can also be introduced.
- ⇒ Make sure everyone has contributed: at the end anyone who has not spoken must be given the stick and also asked to comment on the diagram.

Diagrams are however only as empowering as the processes and institutions in which they are used. Diagrams can significantly increase participation, understanding and communication. But this depends also on the degree of organisational commitment to really listening to understand and learn about the impacts of the programmes and working with people to bring about improvements and change.