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1 **Lenses for learning: Visual techniques in natural resource**
2 **management**

3

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26

27 **ABSTRACT**

28

29 In this study, we explored the use of selected visual techniques (e.g. video,
30 photography, diagramming) in facilitating learning among Indigenous communities
31 living in remote protected areas at sites in Vietnam and Australia. The techniques
32 were employed during interviews and workshops aimed at accessing and enhancing
33 local peoples' perspectives on their landscape and on specific natural resource
34 management issues. The effectiveness of the different techniques for enabling
35 learning varied markedly with the context, highlighting the need for facilitator skill
36 and flexibility in application of techniques. Visual techniques helped to engage
37 participants; encourage unrestrained and lateral thinking; provide opportunities for
38 self-expression and reflection; and to expose participants to perspectives of other
39 community members. Valuable insights emerged on broad aspects of learning and
40 these were incorporated into a simple model that highlights three types of
41 conceptualisation found to be important in these processes.

42

43

44

45

46 **Keywords:** visual methods; participatory communication; social learning; Indigenous;
47 protected areas

48 **1 INTRODUCTION**

49

50 **1.1 Visual techniques in research**

51

52 Visual techniques such as film and photography have long been used in human based
53 research disciplines, for example sociology (Becker, 1974), psychology (Laing,
54 1980), human geography (Aitken and Wingate, 1993), education (Williamson, 1987)
55 and especially anthropology (Bateson and Mead, 1942). Despite this history over
56 several decades, the recognition of visual techniques as credible research tools has
57 been rather slow in some areas – particularly sociology, where there has historically
58 been a ‘barrage of criticism’ of visual methods (Harper, 2004:232). However, a
59 number of texts have appeared from various disciplines recently on visual methods
60 (e.g., Banks, 2001; Pink, 2007; Prosser, 1998) and on analysis of visual
61 representations (e.g., Evans and Hall, 1999; Rose, 2000).

62

63 The way visual methods have been used is highly diverse and their employment
64 across the disciplines has been underpinned by a range of theoretical concepts. In
65 earlier work, visual methods were commonly seen as tools for documentation and
66 dissemination, and this is often still the main emphasis. However, visual approaches
67 have broadened over time to include concepts such as visual ethnography (in
68 anthropology, e.g., Stadhams, 2004) and visual elicitation (in sociology, e.g., Collier
69 and Collier, 1991; Harrison, 2002). And following a general trend in development and
70 social research towards more ‘bottom up’ approaches, researchers from various
71 disciplines have also been developing numerous participatory visual techniques.
72 Examples are participant generated photography (or ‘photo voice’ e.g., Wang *et al.*,
73 2004) and participatory video (e.g., Kindon, 2003).

74

75 The employment of participatory visual techniques has expanded also among
76 practitioners in development (e.g., Braden, 1999), community health (e.g., Kesby,
77 2000), rural and agricultural development (Chambers, 1994), and to a lesser degree in
78 natural resource management (NRM: Bussink, 2003). Visual techniques became
79 particularly popular within approaches such as participatory rapid appraisal (PRA –
80 e.g., Chambers, 1999) and participatory learning and action (PLA e.g., Busza and
81 Schunter, 2001). These include participatory mapping and geographic information
82 systems (e.g., McCall, 2003), photography (e.g., Kolb, 2008), video (e.g., van Mele,
83 2006), theatre (e.g., Mavrocordatos, 1997), timeline and seasonal calendar analysis
84 (Chambers, 1994) and diagramming (e.g., Umoquit, 2008) techniques. Some
85 researchers and practitioners are now starting to employ sophisticated (and generally
86 expensive) visual technology, software and support in development and NRM. Their
87 methods include ‘visualizations’, in which pictures displaying important features of
88 landscapes or future landscape scenarios are shown to participants to elicit responses
89 (and preferences) and/or to communicate concepts. (e.g. Lewis and Sheppard 2006;
90 Williams *et al.*, 2007). Digital 3D gaming environments are also being used, where
91 images of landscapes are recreated in consultation with local people, to record their
92 features and associated Indigenous knowledge (Leavy *et al.*, 2007). In the study
93 described in this paper, the focus has been on using much simpler, cheaper and more
94 accessible visual techniques.

95

96 The growth in use of digital visual methods – especially participatory techniques – by
97 community development and NRM practitioners has flowed partly from the
98 ‘explosion’ in information technology and greater accessibility and ease of use of
99 equipment, such as cheap and disposable cameras, digital cameras and camcorders.

100 Documentation of this type of work has grown in manuals, reports (e.g., FAO 1999;
101 Lunch and Lunch 2006) and some practitioner and academic journals and texts (e.g.,
102 Braden, 1999; Frohman, 2005; Johannson, 1999; Pink, 2008; Shaw and Robertson,
103 1997; White, 2003). Various benefits of visual methods are widely advocated in
104 community development literature, but reference to theory has been lacking, and
105 limited connections have been made between field practitioners and research.
106 Research has usually focused on single techniques, and there have been very few
107 studies within the context of NRM, especially on combinations of visual techniques,
108 or on the use of less expensive equipment and tools.

109

110 **1.2 Research context, intention and process**

111

112 In this research we studied the use of various visual techniques, as supporting tools in
113 two larger projects designed to help understand Indigenous perspectives on two rather
114 different and complex NRM issues, in two countries. The study set out to explore the
115 effectiveness and versatility of techniques across very different contexts, in promoting
116 learning about NRM issues. One project was based in Vietnam and was concerned
117 with assessing the potential for Payments for Environmental Services (PES) for
118 Indigenous communities in Cat Tien National Park. The other was in northern
119 Australia and aimed to improve understanding of Indigenous community preferences
120 for adaptation to climate change.

121

122 In this paper we explore the strengths and weaknesses of selected visual techniques in
123 facilitating learning for deliberation on these NRM issues. Deliberation is viewed here
124 as a process of discourse with the public, in which citizens are encouraged to

125 *'discover latent public values that they have in common with others, and in the*
126 *process to create new public values'*. (Schusler *et al.*, 2003:312). The process at each
127 site involved iterative cycles of activities – 'discussion', 'interaction' and 'reflection'.
128 and the arrival at some form of collective understanding and vision on the topics of
129 interest in NRM. The ability to support (or enhance) these activities was built into the
130 criteria used in assessing the visual techniques (see Section 5.1: *'Features important*
131 *in facilitating learning*). The key activities of discussion, interaction and reflection are
132 further outlined under Section 2: *'Conceptual framework'*, and are incorporated in the
133 core of a model developed as a guide for facilitating learning and communication (see
134 Section 6: *'Discussion'*).

135

136 The visual techniques used were selected for their practicality and accessibility, i.e.
137 availability, reasonably low cost and ease of use by non government organisations,
138 land managers and communities in remote regions. We aimed to develop
139 understandings of features and concepts important in facilitating learning processes,
140 and hence the ways visual techniques can be used to strengthen these processes. A
141 second part of the overall project was to examine how 'visual products' derived from
142 these local learning processes might be used to communicate local perspectives to
143 policy stakeholders (reported elsewhere – in Petheram *et al.*, unpublished Although
144 the context of the two study locations differed markedly, a common feature of the
145 research in Vietnam and Australia was the overall purpose of the projects in which the
146 study of visual techniques was embedded, i.e., the enhancement inquiry with remote
147 communities on specific NRM issues.

148

149 A main rationale for the design of this study was the contention that NRM is most
150 effective if: (1) it is well informed about local residents' preferences, and (2) the

151 residents are empowered to voice opinions and have opportunity and capacity to
152 influence decision making (Bessette, 2006; Lorenzi *et al.*, 2007). The intent was for
153 the researchers¹ and participants to develop deep understandings of each other's
154 perspectives, and ways that local views could be incorporated into the planning of
155 NRM. Much literature suggests that participatory inquiry can assist in the facilitation
156 of learning and communication processes and hence in working towards such goals
157 (e.g., Burke, 1968; Schusler *et al.*, 2003).

158

159 Three further assumptions underpinned the research at all sites: (a) that a fundamental
160 requirement in NRM is sound communication within and between communities and
161 with other stakeholders (Bessette, 2006); (b) that facilitation of effective 'learning'
162 can lead to improved communication within communities, and vice versa (Upreti,
163 2001), and (c) that well designed learning processes can help community members
164 develop a collective perspective and vision – which is important in communicating
165 and negotiating with other stakeholders (Schusler *et al.*, 2003).

166

167 **2. CONCEPTUAL FRAMEWORK**

168

169 The research drew on constructivism (Bodner, 1986), an epistemology which holds
170 that knowledge and meaning is constructed within people's social interactions and
171 experiences. This informed the research, especially in terms of the practice of
172 facilitating learning processes during the fieldwork. We outline below some
173 theoretical aspects of these processes, under the sub sections: '*Social learning*

¹ The term 'researcher' is used interchangeably with 'facilitator' in this paper

174 *theory*’; ‘*Communicative vs strategic rationality*’; ‘*Key activities – discussion,*
175 *interaction and reflection*’; and ‘*The place of visual techniques in this study*’.

176

177 **2.1 Social learning theory**

178

179 We adopt the definition of Schusler *et al.* (2003:11) who view social learning ‘as
180 *learning that occurs when people engage one another, sharing diverse perspectives*
181 *and experiences to develop a common framework of understanding and basis for joint*
182 *action*’. Social learning is seen here as a process that occurs naturally, but which can
183 also be encouraged and deepened through skilled facilitation (Leeuwis, 2004). In this
184 project, we employed various visual techniques to help facilitate learning. The
185 intention was for the process to continue among the participants after the fieldwork
186 ended. This would result in the participants’ continued practice in reflexive thinking
187 (learned in this project) about their own behaviour and perspectives, as well as those
188 of others. Thus an important social learning paradigm adopted in framing this research
189 was that peoples’ behaviours stem from their perspectives, which are developed from
190 their interactions with their community, environment and experiences. As Groot and
191 Maarleveld (2000:4) suggest, the type of active learning that occurs in collective
192 processes such as social learning can lead to ‘... *a deeper understanding about how*
193 *complex issues work and why. It improves people’s capacity to make sense of and*
194 *adapt to an ever-changing world*’.

195

196 One theory that is used to help distinguish between different depths of learning is
197 ‘single, double and triple loop learning’, which is derived from theories on
198 organisational behaviour by Argyris and Schon (1978: 2). They maintain that learning
199 involves varying degrees of the ‘*detection and correction of error*’. Single loop

200 learning occurs when learners modify errors by adapting habitual behaviour. Double
201 loop learning is said to involve more creativity and critical thinking than single loop
202 learning. It occurs when learners modify errors by questioning and analysing the
203 ‘*governing variables*’ behind their underlying values, norms and behaviours. Triple
204 loop learning, which is sometimes termed ‘learning about learning’ or ‘higher level
205 learning’, occurs where approaches and techniques of learning are questioned and
206 analysed. King (2002) claims that these various depths of learning are useful for
207 different purposes in resource management projects.

208

209 **2.2 Communicative vs strategic rationality – in facilitation of learning**

210

211

212 Some authors imply that facilitators of goal-oriented projects tend towards ‘strategic
213 rationality’ (from Huber 1998:95), rather than follow the more idealistic principles of
214 ‘communicative rationality’. Others argue that there has been excessive dependence
215 upon Habermas’ (1984) theory of ‘communicative rationality’ in previous literature
216 on social learning (Leeuwis, 1995; Pijnenburg, 2002). Proponents of communicative
217 rationality hold that people communicate best when they have equal power and are
218 allowed opportunity to reach reasoned consensus on issues of disagreement. In
219 contrast, in strategic rationality, people are thought to act strategically in their own
220 self interest. Like Leeuwis *et al.* (2002) we argue that communicative actions can at
221 the same time be strategic and the boundary between the terms can often be blurry: at
222 times facilitator action needs to be strategic for effective and ‘deep’ learning to occur.

223

224

225 **2.3 Key activities – discussion, interaction and reflection**

226

227 The activities – ‘discussion’, ‘interaction’ and ‘reflection’ – were identified early in
228 our experience of community inquiry process, and from literature (e.g. Keen *et al.*,
229 2005; Bessette, 2006) as important in facilitating learning on NRM issues. The
230 process at all research sites therefore involved using visual techniques to support these
231 ‘key activities’, particularly during group work. The three activities are incorporated
232 into an emergent model that we present in Section 6: ‘*Discussion*’.

233

234 **2.4 The place of visual techniques in this study**

235

236 In this study visual techniques were utilised (and their effectiveness assessed) as
237 supporting tools to enhance researcher and participant understanding of local context
238 and participants’ perspectives and preferences on NRM issues.

239

240 In this research we see visual techniques and images as ‘*mediums*’ for the
241 development of new knowledge – not as ‘*neutral reflections of reality*’ (Buckingham
242 2009:635) This new knowledge is constructed through a process of deliberation
243 between researchers and participants – involving discussion, reflection and
244 interaction.

245

246 **3. RESEARCH SITES AND PARTICIPANTS**

247

248 **3.1 Vietnam research site**

249

250 Cat Tien National Park ('CTNP') is located in southern Vietnam about 150 km north
251 of Ho Chi Minh City. Fieldwork was conducted in the Park at two sub sites on three
252 field trips between 2008 and 2009. The larger project under which this study was
253 conducted in Vietnam was focused around options for NRM, and more specifically on
254 understanding the potential for implementing Payments for Environmental Services
255 (Petheram and Campbell, 2010).

256

257 Fieldwork entailed individual interviews and workshops in which visual techniques
258 were used to promote discussion, interaction and reflection in a community inquiry
259 process. Forty-one participants were Indigenous (and eighteen non-Indigenous
260 people) living in and around the Park. Initially, views were sought on a wide range of
261 issues, and subsequently attention was focused on people's preferences in the event of
262 a PES scheme being introduced.

263

264 **3.2 Australian research site**

265

266 The Gove Peninsula lies on the east coast of Arnhem land, northern Australia.
267 Fieldwork was conducted over five visits between 2008-2010 to the Dhimurru
268 Indigenous Protected Area, working primarily with participants from two
269 communities. Research entailed interviews and three workshops with a total of nine
270 Indigenous Rangers, and interviews and two workshops with a total of twelve
271 Indigenous women from the two communities. Views were sought on a wide range of
272 issues, including changes in participant's landscape, as well as views on climate
273 change, and preferences for community adaptation (Petheram *et al.*, in

274 2010). Questionnaires and visual choice modeling experiments were also administered
275 in a related study (Zander and Petheram, unpublished).

276

277 **4. RESEARCH APPROACH**

278

279 Visual techniques were used during the interviews and workshops with community
280 participants at the research sites in Vietnam and Australia. The selection of techniques
281 was made by researcher/s but influenced by participant's needs and preferences. The
282 following sub-sections describe the techniques used and the way their strengths and
283 weaknesses were assessed.

284

285 **4.1 Visual techniques used**

286

287 The literature provides information on a suite of visual techniques from visual
288 sociology, anthropology, community development, health and NRM practice. The
289 techniques selected for this study were used in a variety of ways at the sites in the two
290 regions, to allow exploration of their efficacy in remote but widely differing
291 situations.

292

293 It is important to emphasise that the visual techniques were used in conjunction with
294 more standard verbal research techniques (in-depth interviews and workshops) to
295 deliberately enhance discussion, interaction and reflection on NRM topics. Translators
296 were usually employed, except in the case of some Australian participants who had
297 proficiency in English. The main visual techniques and the way they were used at the
298 two sites are summarised in Table 1.

299 *Table 1: Summary of visual techniques and their use in Vietnam and northern*
 300 *Australia. Note: Darker shading denotes more frequent use of the technique than lighter*
 301 *shading (blank boxes indicate no use of the technique).*
 302

| Visual technique | Description | Vietnam | Australia |
|--|--|---------|-----------|
| Visual elicitation: display of photographs or video on camera, laptop or screen (e.g., Banks, 2001) | Photos/video collected by researcher (or taken by participants) were used to explain or demonstrate a concept; or to elicit feedback about particular landscapes/ practices, or to generate discussion about a particular topic. Used in interviews and workshops | | |
| Hypermedia DVD including photos, video clips, photos and text | Created with participant input to help summarise collective ideas and opinions. Also useful for communicating results to other stakeholders, verifying participant perspectives and building rapport among participants. Used in interviews and workshops | | |
| Participant generated photography or video clips (e.g., Frohman, 2005) | Participants were given a still or video camera and asked to take images of features of their landscape (that have positive or negative implications to them) and to explain these. Some photos and video were used later in interviews and workshops. | | |
| Video statements: clips of participants talking about issues | Used to summarise participant views, seek feedback and/or verify perspectives on particular topic, e.g., reoccurring themes, controversial opinions, workshop synthesis etc. Used in interviews and workshops (video taken by participants and/or researchers). | | |
| Rich picture diagramming (RPD) (e.g., Chambers, 2001) | Participants drew on sheets of paper, features of their landscape that are important to them (positive or negative). Also used to build future scenarios. Used in interviews and workshops | | |
| Visual summaries: short video/photo presentations on issues and topics | Created (1) by researcher to help communicate research topics and (2) by researcher with input from participants to summarise collective ideas and opinions. Used for verifying perspectives, generating discussion, building rapport among participants – in interviews and workshops | | |
| Historial analysis (Chambers, 1997) | Timelines were drawn with participants, with pictures (and words) representing different historical events | | |
| SWOT analysis (Chambers, 1997) | Strengths, weaknesses, opportunities, threats were drawn with participants | | |
| Matrix ranking exercises (Chambers, 1997) | Participants visually ranked NRM options with pebbles or pen | | |
| Participatory sculpting (Fig 2) | Participants sculpted play-doh in an extension of RPD (to modify aspects of diagrams, or add other elements to diagrams). Used only in workshops | | |
| Seasonal calendar analysis (Chambers, 1997) | Participants drew elements from their traditional seasonal calendar and described recent changes to the calendar. | | |
| Visual choice modelling (Reported in Zander and Petheram, unpublished) | Computer drawn images were used to elicit responses from participants about preferences for future scenarios and general discussion. Used in interviews and workshops. | | |

303

304 4.2 Applying the visual techniques

305

306 Some techniques were used more frequently than others, and the combinations varied
307 at each site. The choice of techniques depended on the purpose, context, timelines and
308 participant preferences. Practical considerations were often important. For example,
309 during inclement weather it was difficult to take photos or video outdoors – so more
310 diagramming was used, or greater emphasis placed on verbal communication. Time
311 for participation in workshops was often restricted by participants' commitments,
312 such as child-rearing, farming, community activities, work, and ceremonies. Over the
313 course of the community inquiry, greater insight into the effectiveness of different
314 techniques for different purposes was gained, and the types and application of
315 techniques were modified.

316

317 Although the conditions and (NRM) topics of interest varied across the field sites and
318 sub-sites, three main stages emerged as important in the use of visual techniques.
319 These stages became incorporated into the inquiry process at each site, using the
320 visual techniques as outlined below:

321

- 322 • Stage 1. In-depth interviews and workshop/s were conducted on general
323 aspects of people's livelihoods and landscape. Here we used one of (or
324 a combination of): rich picture diagramming (RPD); participant
325 generated photography (PGP), participatory sculpting; historical
326 analysis (Vietnam only); SWOT analysis (Vietnam only); and visual
327 elicitation – to engage and interest participants, and to explore people's
328 general perspectives.

- 329 • Stage 2. In later workshops and interviews – we used RPD; PGP;
330 visual elicitation; seasonal calendar analysis (Australia only); visual
331 choice modelling (Australia only); video statement (recording) and
332 hypermedia DVDs for generating discussion on specific NRM topics.
333 • Stage 3. In interviews and workshops – we used video statements and
334 summaries; hypermedia DVD creation; and matrix ranking exercises –
335 to negotiate issues, and develop ‘collective perspectives’ relating to the
336 specific NRM topics.

337

338 Some activities during the field work required a greater degree of interaction with
339 community participants than others. And the level of participation depended on their
340 desire to become involved, time constraints, resources available and other factors.
341 Thus, photographs or video footage were sometimes collected from secondary
342 sources, or ‘taken’ by the researcher, or sometimes by participants. Editing of video
343 was mostly done by the researcher. The results of editing were shown (as video clips)
344 to individuals and community, to allow feedback, reflection, verification and re-
345 editing or deletion. It was useful at later stages of the inquiry process for community
346 members to consider together the type of visual products (and the messages) that they
347 would like to communicate to other stakeholders, and especially to government
348 agencies.

349

350 4.2.1 *Clarifying the uses of video*

351

352 At the end of interviews, participants were sometimes asked if they wanted to talk on
353 video about a prominent theme or issue arising, or to summarise a common view or
354 argument for other community members. Such statements were captured by video

355 camera, or a webcam on a laptop computer. After obtaining consent, these clips were
356 later placed on VCD² or DVD – to allow participants to review the main themes
357 arising from the research, and to replay for participants in later interviews or
358 workshops for further discussion and reflection. Similarly in workshops, before
359 conclusion the participants were recorded where they wished to do so, summarising
360 the main collective perspectives that arose from discussions. These recordings were
361 compiled on VCD or DVD, and then replayed to participants for further discussion
362 and reflection. Later in the research, participants recorded video clip messages
363 specifically for other (e.g. policy) audiences, based on themes that arose from
364 interviews and workshops. The video clips and other visual images (e.g. photographs,
365 and images of rich diagrams, sculptures, music and video summaries derived from the
366 community inquiry) were incorporated into interactive, hypermedia DVDs. These
367 DVDs were created with input from (and verification) by participants for the purpose
368 of communicating local messages to other stakeholders.

369

370 **4.3 Assessing the visual techniques**

371

372

373 The research process in the overall study involved continuous gathering and analysis
374 of data on the use and effectiveness of the visual techniques, as well as on peoples
375 perceptions of the NRM topics . This paper is concerned with the first set of data – i.e.
376 on the use and value of visual techniques in supporting learning. Results of analysis of
377 data on NRM topics has been reported by Petheram and Campbell, (2010) and
378 Petheram *et al.* (2010). Visual techniques were used in a range of situations, so as to
379 allow general assessment of their strengths and weaknesses in facilitating different
380 aspects of learning. This assessment was carried out by two means: (1) researcher

² Video Compact Disc. (In Vietnam one of the village's main hall, and a few individuals had VCD players, but none had DVD players)

381 observations of practicality and participant reactions to techniques, and (2) feedback
382 from participants and research partners during interviews and workshops – on the
383 effectiveness of techniques. Researchers kept notes on the usefulness and difficulties
384 experienced while using each visual technique in the field, and participants’ opinions
385 of the usefulness of each technique were sought and recorded during field activities.
386 The assessment could not rely entirely on participants’ opinions of the techniques, as
387 all visual techniques were new to them and they had no basis for comparing visual
388 techniques with other techniques. No pre-set criteria were used in assessing
389 techniques; rather, the data and analysis were used to seek features that arose as
390 important in using, selecting or rejecting techniques for various circumstances.

391

392 **4.4 Data analysis**

393

394 In our study we drew from grounded theory, where theory is seen as emergent from
395 data grounded from the field (Glaser, 1992). Analysis of data (i.e. ‘words’ derived
396 from notes on researcher observations and on participant responses) involved
397 ‘substantive and ‘theoretical’ coding (Fernandez, 2004). Substantive coding led to
398 the identification of main themes and categories, and also became the basis for
399 development of theories and frameworks through theoretical coding. During coding
400 we used the constant comparison method, i.e. constantly comparing emergent, new
401 information with previously identified information (Carpenter Rinaldi, 1995). This
402 was designed to identify categories, relationships between and within categories, as
403 well as core category (Glaser, 1992).

404

405 **5. RESULTS**

406

407 The results are outlined under subheadings relating to five main themes that arose
408 from analysis of data on the visual techniques, i.e. '*Features important in facilitating*
409 *learning*'; '*Effectiveness of visual techniques*'; '*Use of visual techniques in group*
410 *versus individual settings*'; '*Visual techniques to encourage 'unrestrained' thinking*';
411 and '*Conceptualisation in social learning*'.

412

413 **5.1 Features important in facilitating learning**

414

415 From the data gathered in the process of discourse with individuals and groups, we
416 identified three main features as important generally in facilitation learning in inquiry
417 with communities on NRM topics. The first of these, 'Engaging and Scoping', relates
418 to establishing preconditions necessary for creating an appropriate and comfortable
419 space and frame for participants to be inspired, confident, positive and willing to work
420 together with the facilitator in learning. It also entails the initial encouragement of
421 'active listening' (Engel and Korf, 2005) and 'unrestrained' thinking (Schusler *et al.*,
422 2003:317) by participants and researchers in the general context and broad
423 perspectives and values held by participants. The second, 'Focusing on specific NRM
424 topics', relates to the encouragement of deep reflection on specific NRM topics, and
425 relationships to background perspectives and values. And the third feature,
426 'Negotiating and Communicating', relates to the development of a collective vision
427 and perspective (which could be communicated to other stakeholders). These three
428 features can be further broken down into a total of seven components, as summarised
429 in Table 2.

430

431 *Table 2. Important features (and their components) in facilitating learning in*

432 *community inquiry*

| Feature number | Main features important in facilitation of learning, and their components |
|-----------------------|--|
| 1 | ENGAGING AND SCOPING a. Enhancing researcher engagement (e.g., building rapport, engaging participants in dialogue). b. Strengthening community spirit, and capacity building (e.g., confidence building, empowerment). c. Improving researcher/facilitator and participant understanding of general local issues. |
| 2 | FOCUSSING ON SPECIFIC (NRM) TOPICS d. Facilitating group learning to focus on the specific NRM topics – through participatory activities and providing feedback. |
| 3 | NEGOTIATING AND COMMUNICATING e. Enhancing communication with and in community, and with other stakeholders (e.g., breaking down barriers between different ethnic groups, status levels). f. Helping develop a collective community perspective. g. Providing an avenue to communicate to other stakeholders. |

433

434 The seven components from Table 2 were identified from early field research and

435 literature review, and were utilised later in this study as criteria in assessing the

436 properties and effectiveness of the visual techniques used. The identification of these

437 criteria and their later use to assess the visual methods is consistent with an action

438 research approach whereby emergent data helps guide later research processes.

439

440 **5.2 Effectiveness of visual techniques**

441

442 At later stages of the research, the effectiveness of the visual techniques was assessed
443 over their continuous use in the two countries, on the basis of the researcher
444 observations and participant comments, using the features (and their components)
445 described in Table 2, as general assessment criteria. Results are summarised in
446 Appendix A and described in greater detail in Results and Discussion. Flexibility in
447 choice of techniques arose as a vital feature of the research process. Different
448 techniques were found to be useful for different parts of the study, and for different
449 purposes and stages of learning at research sites.

450

451 Overall, rich picture diagramming, video statements and hypermedia DVDs were the
452 most effective and versatile techniques, and were therefore used most frequently.
453 Experiences using the techniques were similar across the field sites within each
454 country. However, some techniques were more effective than others in each country
455 For example RPD was more effective in Australia than Vietnam (where less educated
456 women did not have familiarity with pencils/pens), but video statements were more
457 effective in Vietnam (where video was more of an engaging novelty than in
458 Australia).

459

460 RPD appeared to be the most versatile technique, for a range of purposes – from
461 helping to engage participants to encouraging deep thinking. Video was particularly
462 valuable when encouraging discussion on specific NRM topics during the facilitation
463 of learning. Techniques like SWOT, historical, seasonal calendar and visual analysis
464 and choice modelling were useful only for specific purposes. We expand on the
465 results in the following sections

466

467 *5.2.1 Participant responses and views on visual techniques*

468

469 All participants indicated that visual techniques had been useful and had added value
470 and enjoyment to the inquiry process, although some people were more enthusiastic
471 than others. A few participants were initially hesitant to be captured on video or on
472 still camera, or were anxious about damaging the equipment while entrusted with it
473 for use.

474

475 Participants indicated that they particularly appreciated watching video clips, as part
476 of the inquiry process. In northern Australia, where people were quite accustomed to
477 sketching and drawing, participants particularly enjoyed RPD. Some participants
478 stated that this process was relaxing, and *'helped us get to know you [the*
479 *researcher/s] better too'*. All participants responded that they would like to be
480 involved in the use of visual techniques if they were involved in future
481 research/projects. Northern Australian participants – particularly male rangers who
482 had experience of using video – indicated they would like greater involvement in
483 filming and video production in the future. They were enthusiastic about the idea of
484 being able to create visual products (e.g., short videos) and sharing these with other
485 stakeholders, and they had ideas about presenting video (on climate change issues) at
486 an Indigenous festival, to others in their community and to children at schools. After a
487 workshop in northern Australian a participant said: *'Listening and seeing each other*
488 *in this way is important. When we learn to think in these ways we can understand*
489 *these better and then also explain to others'*. Many participants in both Vietnam and
490 Australia were enthusiastic about video as a medium for expressing their views to
491 other stakeholders (especially those not normally accessible to them). Some

492 participants in Vietnam suggested their video statements should go on National
493 television to reach the wider community, which may influence policy makers.

494

495 Several participants in Vietnam who held positions of authority (informal and formal)
496 were very enthusiastic about using the VCDs and video statements during village
497 meetings, to further generate discussion and refine development of ideas among the
498 local resident population and to continue refining their perspectives, with a view to
499 communicating these to National Park management and government officials. This
500 demonstrates the way that some participants naturally adopted the visual projects
501 (especially at the Vietnam site) for future self reflection, information sharing and
502 advocacy.

503

504 **5.3 Use of visual techniques in group versus individual settings**

505

506 Participants in both countries clearly enjoyed using visual techniques in workshop
507 settings, more than on a one to one basis. After a workshop involving visual
508 techniques in Vietnam, a participant said: *'I have been in other workshops with*
509 *researchers and I am always bored. But this was really fun and interesting, and I*
510 *really liked watching video of us talking. It helped us talk to each other more'*

511

512 In such group contexts, where people had opportunity to interact and reflect with
513 others, the visual techniques allowed facilitators to promote deeper thinking on NRM
514 issues (i.e. questioning underlying behaviour and perspectives), and thus we assume
515 social learning, than in individual interviews. However, in-depth (oral) interviews
516 played other important roles – in providing background information, empowering

517 people to voice their opinions, and exposing and negotiating sensitive issues. Some
518 visual techniques, such as PGP and RPD, were quite effective in individual in-depth
519 interviews, as a means of encouraging ‘unrestrained’ reflection and expression, and
520 from a different perspective from which they were familiar. However, some people
521 (particularly women and participants with less formal education in Vietnam) were too
522 shy and reticent to be involved in RPD during in-depth interviews, but were more
523 willing to be involved working with groups during workshops.

524

525 **5.4 Visual techniques to encourage ‘unrestrained’ thinking**

526

527 When rich picture diagrams (‘RPDs’) and participant generated photography (‘PGP’)
528 were utilised to seek understandings of peoples’ perspectives, most participants
529 revealed their views on their natural surroundings first and foremost (see Figure 1). In
530 some cases, religious or spiritual views were also expressed through these exercises –
531 topics that were seldom mentioned during only verbal interviews. For example,
532 images of a specific hill, island, tree, or other places with strong spiritual or cultural
533 significance, were often depicted in diagrams or photos. It seemed that visual
534 exercises provided a better means to communicate deeper, intrinsic and tacit values
535 than verbal interview and conversation alone would normally permit. Visual
536 techniques often made it easier for people to ‘see in a different way’, and also express
537 (abstract) topics that they found difficulty expressing verbally (e.g., due to political,
538 cultural or religious taboos in Vietnam). In the northern Australian sites many
539 participants – particularly women – commonly used metaphors to express their
540 perspectives. It seemed that images often tended to take the place of metaphoric
541 speech – especially when dealing with topics that traditionally could not be stated

542 directly or easily. For example, a participant may be uncomfortable talking of
543 religious or spiritual concepts, but would (in preference) photograph scenes of
544 spiritual significance (see Figure 1). The RPD, PGP and participatory sculpting (see
545 Figure 2) were particularly helpful in providing a way to allow people to express and
546 explain these metaphors.

547

548 *Figure 1*

549

550 *Figure 2*

551

552 While some of the techniques were useful for promoting open expression about
553 spiritual and natural values, on some occasions video media limited the discussion of
554 controversial topics (e.g. corruption of regional leaders or government officials).

555 Where participants were willing to talk on video on such issues, researchers needed to
556 exercise caution in deciding whether to show these images to other stakeholders³.

557 However, in most cases participants were very willing to allow use of descriptions,
558 diagrams and photos about these topics. This suggests that in certain situations, other
559 techniques can be less intimidating (or less politically risky) than direct video
560 recording (of participant opinion). After several video recordings, some participants
561 became less hesitant about expressing views on controversial topics on video, and

³ Consent was always sought from participants for photography and video recording, and also for later use of the images. Footage was always shown to participants, and images deleted on request.

562 even appeared to gain satisfaction from placing their views on record recorded. As
563 one female participant in Australia said '*we need other people to know about these*
564 *issues, they are important and we need to talk about them*'.

565

566

567 **5.5 Combinations of techniques**

568

569

570 In some cases, it was helpful to combine the use of certain techniques. For example,
571 participatory sculpting and diagramming were very compatible when used together.
572 Women participants in Australia found that if they drew diagrams, they could add
573 extra dynamic features (e.g. changes or actions) to their own or other participants
574 diagrams by using the play doh (see Figure 3.4). The play doh (representing the
575 features) could easily be modified by participants during discussions.

576

577 Photos, video and hypermedia DVDs were also very valuable in recording diagrams,
578 sculptures, seasonal calendars, timelines, matrices, music and so on. These records
579 could be used later during the inquiry process, such as for use in enhancing recall
580 among researcher/s and participants, providing feedback for discussion and in
581 communicating local perspectives to policy arenas (Petheram *et al.*, unpublished b).
582 Hypermedia DVDs were particularly helpful in providing an organising structure to
583 store, and present these images, as well as supporting text.

584

585

586 5.6 Conceptualisation in social learning

587

588

589 From the data gathered across various sites and communities, we concluded that
590 participants were involved in three main types of conceptualisation during learning
591 processes. We termed these: ‘open conceptualisation’, ‘specific conceptualisation’
592 and ‘synthesis of thinking’. It seems important that facilitators of learning processes
593 understand these types of conceptualisation, and ways in which each might be aided
594 or enhanced. On deeper analysis, we found that these types of conceptualisation
595 corresponded closely with the three main features that were identified early in the
596 research as important in facilitating learning (in Table 2).

597

598 During the first stage – open conceptualisation – participants were engaged through a
599 general exploration of their environment and sharing of ideas. Then (in specific
600 conceptualisation) the process became focused on facilitating learning about specific
601 concepts of interest in NRM – such as PES. The third stage of conceptualisation
602 involved deep reflection and negotiating, as participants worked towards a synthesis
603 of thinking about the particular NRM issue/s.

604

605 Our observations indicate that the strengths of visual techniques in promoting the
606 different features important in learning (Appendix A) can also act to enhance the
607 corresponding types of conceptualisation. Our findings are outlined below on visual
608 techniques useful in promoting each stage of conceptualisation, together with further
609 explanation of the three types. This information can be useful for practitioners
610 applying visual techniques for the facilitation of learning in NRM.

611

612 *5.6.1 Techniques for open conceptualisation*

613

614 Before broaching discussion on specific topic areas in NRM, it was found to be
615 essential for the researchers and participants to share their general aims and
616 perspectives in a broad and open manner. Such exploration needed to occur in
617 unrestrained and non routine ways, so as to encourage open and free thinking –
618 without being too influenced by narrow project topics. This ‘open conceptualisation’
619 also helped in building trust, confidence and positive thinking, and allowed strong
620 engagement between researcher and participants later. All these steps emerged as vital
621 prerequisites in facilitating deeper stages of learning.

622

623 RPD and PGP were particularly valuable techniques for providing participants with an
624 ‘open’ and lateral way to conceptualise and express features in their landscape that
625 had important (positive or negative) influence on their lives (see [Appendix A](#)). Such
626 visual expression was useful in revealing values and preferences in a broad and
627 creative way. Hence these two techniques were particularly valuable in providing
628 general insight into the importance placed on different components of the landscape
629 and they often helped in understanding the physical and emotional connections many
630 participants had with nature.

631

632 Diagramming (RPD) was generally more versatile in allowing participants greater
633 flexibility (than PGP) to include views on broader aspects that were not immediately
634 visible in the landscape (e.g., features that are distant, or that existed in the past, or
635 may exist in the future). People could sketch objects or even symbols of abstract
636 concepts – that could not be photographed.

637

Deleted: Table 3

638 *5.6.2 Techniques for specific conceptualisation*

639

640 After discussing broad topics, it was often helpful for the researcher to share
641 knowledge of their area as well as encourage participants to conceptualise and discuss
642 their views on very specific topics (e.g., climate change), and on values, norms and
643 behaviours underlying their perspectives. For the researcher, having tools on hand that
644 provided feedback or present scenarios, helped to encourage participants to focus
645 attention on specific topics (i.e. in ‘specific conceptualisation’).

646

647 RPD proved especially useful and versatile in exploring specific topics. Participants
648 could be asked to draw images of aspects they would like (or not like) to see in their
649 landscape in the future, or to depict scenes that may occur under different scenarios
650 (i.e. a form of visioning or scenario building) and to discuss reasons for these
651 preferences and views.

652

653 Other visual techniques were also useful in ‘focusing attention’ on particular topics.
654 For example, photo elicitation allowed participants to respond to an image of
655 particular scenes in the landscape (e.g. a degraded beach, an agricultural plot, children
656 not in school) and discuss underlying reasons for their responses and opinions. The
657 same image could be used to seek responses from a range of people at different
658 locations and times. Information derived from the open conceptualisation stage could
659 be useful to help guide this more specific conceptualisation.

660

661 Visual elicitation, particularly of participants talking about specific topics or issues
662 (visual statements recorded from interviews or workshops) helped to encourage
663 dialogue and hence elicit responses from other participants on the same topic. Such

664 techniques were useful in understanding differences in participants beliefs on a
665 particular topic, and expanding on particular topics, as well as in knowledge sharing
666 (e.g., between different ethnic groups). Thus they provided a basis for ‘social learning
667 activity’ – through participants reflecting and reframing views on particular issues,
668 refining their ideas and expressing underlying values and reasons for their behaviours
669 and beliefs. Video of village or forest scenes were engaging to participants, but not
670 usually very helpful in generating specific discussion and eliciting response. Some
671 participants commented that moving images are too fast to focus specifically on some
672 of these scenes. Thus, shorter clips (and photos) were better than long scenes.
673 However, video clips of people taking part in specific work or other activity (e.g.,
674 agricultural practices) was very helpful in stimulating dialogue on specific topics. The
675 video statements and hypermedia DVDs were found to be valuable for focusing
676 attention on particular topics – and particularly for verifying the researchers’
677 perceptions of the village situation, and of participants’ perspectives

678

679 *5.6.3 Techniques for synthesis of thinking*

680

681 In promoting collective thinking, it was necessary for researchers and participants to
682 summarise and synthesise the different perspectives within a group. This ‘synthesis of
683 thinking’ occurred best after ‘open’ and ‘specific’ conceptualisation.

684

685 All the visual techniques provided (through their ‘products’) a record of deliberation
686 processes and knowledge sharing at the research sites – although some were more
687 valuable than others in this respect. Video footage of participants talking about
688 particular topics was especially useful for the purpose of recapping on different views,

689 and was a valuable component in discourse at later stages, especially in developing
690 hypermedia DVDs. The co-development of such DVDs required concerted effort by
691 researcher and local people, to reach mutual understandings on perceptions of
692 particular topics. Production (and showing) of these DVDs was helpful for
693 encouraging participants to synthesise and summarise group understandings and
694 opinions, and for refining ideas that they wanted to communicate to others. It became
695 apparent that information derived from the ‘open’ and ‘specific conceptualisation’
696 stages were very important in guiding the ‘synthesis of thinking’.

697

698 ‘Synthesis of thinking’ involves a slow conceptualisation process and needs continued
699 re-visiting, and we found that ‘lack of time’ seriously limited this important stage .
700 We found that facilitators were not necessarily needed for revisiting and completion
701 of this (synthesis) stage – if community members had become adequately engaged
702 and had access to resources. As mentioned earlier, some of the participants were keen
703 to use the visual products derived from earlier processes, during later village
704 meetings, to further discuss and refine perspectives and visions for the future.
705 However, for the communication of these perspectives to other stakeholders,
706 researchers will commonly be needed initially to act as intermediaries (or ‘boundary
707 agents’; Merali, 2002) through delivering community messages to other non-
708 community groups (and from other groups back to communities).

709

710 **5.7 LIMITATIONS OF THE STUDY AND VISUAL TECHNIQUES**

711

712 Various limitations and requirements influenced the effectiveness of visual
713 techniques. These were mainly associated with constraints of time and resource

714 availability, and the relative difficulty of use of some techniques, and the need for
715 trusting relationships and hence for long term project duration.
716

717 The creation of video and DVDs was the most time (and resource) consuming activity
718 associated with the techniques used. The more participatory, digital techniques (e.g
719 participant generated video) were usually more difficult to use than simpler, iterative
720 ones (e.g., RPD), because participants were invariably busy with their farming and
721 other livelihood activities. Few people had time to be heavily involved in (highly
722 participatory) video production, and research funding was not adequate to pay
723 participants for their time lost from work or other commitments. The considerable
724 time spent editing and subtitling video clips reduced the time available for other
725 aspects of fieldwork. Time could have been more effectively spent on research if an
726 information technology (IT) or video technician had been available to manage editing
727 and technical issues. Sometimes use of the more technology dependent techniques
728 (e.g., video and DVDs) were limited by lack of access to electricity in the remote
729 locations. The software available for editing video and producing DVDs can also
730 markedly affect the time required.
731

732 It became very clear early in the fieldwork that strong and trusting relationships
733 between the participants and the facilitator (as well as the translators, and assistants)
734 were crucial to ensuring a sound engagement process. Visual techniques were
735 valuable in building these relationships, but the translator and facilitator's language
736 skills, and engaging and facilitating skills – all had an impact on the effectiveness in
737 promoting learning. Other requirements in facilitation were proficiency with visual
738 techniques, sensitivity in selecting techniques and appropriate images, timing, and
739 care in the way techniques were introduced in different cultural settings. It was

740 difficult to account for all these variables, but special effort was made to consider
741 these factors when assessing the effectiveness of particular techniques.
742

743 A difficulty noted in working with some of the visual techniques was that their use
744 sometimes gave rise to subtle power differences, which could affect learning and
745 communication processes. For instance, if certain techniques were introduced
746 inappropriately in these remote communities, this could raise the 'perceived authority'
747 of the researcher (or certain other participants) and thereby disempower some
748 participants and cause barriers to learning. For example, this can occur where a video
749 camera is used for immediate recording of participants, without proper levels of
750 engagement and trust being built between researcher and participants prior to
751 recording. In other cases, for example where strong engagement was built, the power
752 balance seemed to shift in the opposite direction, that is participants felt they were the
753 'experts' – in explaining aspects and interpretations of local images. This finding
754 further highlights the need for practitioners to employ sensitivity and critical
755 awareness in using these techniques in working in remote cross cultural situations.
756

757 By the end of the 2 year contact with the village sites, quite strong connections with
758 communities had developed and useful medium term results had emerged. For the
759 study of long-term influences of using these visual techniques on NRM planning and
760 community livelihoods, a more prolonged period of fieldwork would be required.
761

762 In working with visual techniques, facilitators need to be highly mindful of ethical
763 ramifications of the use of visual techniques, especially video – where peoples'
764 statements can easily be taken out of context. Protocols need to be developed to
765 clarify ways and circumstances in which images are to be used in a project. For

766 example, in the northern Australian context, recordings of individuals who later
767 become deceased cannot then be used in photographic or video images (or at least a
768 warning needs to be given to other Indigenous potential viewers). In the Vietnam field
769 site, it was important to be cautious about showing controversial statements made by
770 villagers to certain officials, without the permission of respondents

771

772 Commonly in NRM, there is a need to access local perspectives in instrumental ways
773 and often on very specific topics that are not of high concern to local participants. We
774 felt that this study was often compromised by the limitations and goals of the larger
775 projects within which we were working. Without these limitations, the project could
776 have been more participatory and open, rather than confined to seeking views on
777 specific NRM topics.

778

779 **6. DISCUSSION: THE POTENTIAL FOR VISUAL TECHNIQUES**

780

781 The wide variation we found in the effectiveness of particular visual techniques for
782 different purposes and in different contexts highlighted the need for flexibility in
783 adapting visual tools to suit the situation and resources available. Although the
784 primary researcher came to the project with sound skills in use of visual techniques
785 and some group facilitation experience, considerable resourcefulness was needed at
786 each new research site and cultural setting, to enable the potential of visual techniques
787 to be harnessed.

788

789 One of the clear strengths of incorporating visual techniques into interviews and
790 workshops was the way these encouraged participants to reflect and discuss in a less
791 'restrained' and 'different' way, than did verbal techniques alone. Visual tools and

792 activities provided means for participants (including researchers) to conceptualise
793 topics and issues in ways different to those familiar to them. The use of visual images
794 often enabled people to remove themselves slightly from their reality, and hence to
795 see the larger ‘picture’, or another perspective. This was particularly apparent in PGP,
796 RPD, and video work. As explained by Van der Riet (2008:555), discussion around a
797 visually created artefact is *‘less confrontational than direct questioning because it is*
798 *the diagram or map, rather than the individual person which is “interviewed”*.
799

800 The employment of visual techniques such as PGP and RPD as means for participants
801 to express themselves in a *‘different’* manner, was useful in various ways. Firstly, it
802 brought out perspectives that may not otherwise have been seen. Secondly visual
803 expression had clear benefits for the researcher working in a cross cultural context and
804 foreign language. Sometimes the techniques allowed participants to express views
805 (visually), where verbal expression was taboo or threatening (e.g., topics on religion,
806 spiritual values, politics). This was more apparent in Vietnam than in northern
807 Australia. Additionally people whose voices are not commonly heard, had the
808 opportunity to express their views in other ways.
809

810 Video and some other techniques aided in the research (and development) process, by
811 providing a record (or ‘reliable memory’) of discussions and learning (see Appendix
812 A). Such records can be very valuable for later promotion of discussion and reflection,
813 and hence in generating feedback locally and externally. As Kitchener (1983)
814 maintains, visual activities and processes allow participants to evaluate and monitor
815 activities, and to check the suitability of various actions or solutions to issues.
816 Additionally, visual records are very useful to researchers in allowing verification of
817 their own perceptions of people’s views and the results of research. These visual

818 records can also play an important role in communicating local perspectives to other
819 stakeholders in a way that can be emotive, real and impactful. The potential benefits
820 and limitations of visual ‘products’ for this purpose are elaborated in greater detail in
821 Petheram *et al.* b (unpublished)

822

823 Although most of the visual techniques were most effective when used in group
824 contexts, it is important to stress that individual interviews played an integral role in
825 deliberation processes. On some occasions participants did not want to argue about
826 sensitive topics (in workshops), so tended to accept the wider group’s opinions. Janis
827 (1982) refers to the concept of ‘groupthink’, where deep and rich thinking by
828 individuals can be lost in group situations. Individual interviews provided a valuable
829 way for facilitator/s to deal with such topics. However, visual techniques, such as the
830 showing of video summaries and statements to individual participants (or smaller
831 groups), were at times useful for broaching contentious topic areas. In some instances,
832 participants felt more comfortable recording their perspectives on video, away from
833 group pressure.

834

835 *6.8.1 A model for facilitating learning in NRM*

836

837 Our analysis of data (and literature) led to the emergence of a simple model – to
838 illustrate the types of conceptualisation and activities important in facilitation of
839 learning for NRM project processes. Figure 3 shows the three types of thinking that
840 can be encouraged among participants – arranged around the perimeter of three
841 overlapping circles. These three inner circles represent a learning cycle, composed of
842 the activities important for the functioning of the learning process – interaction,

843 discussion and reflection. For effective learning to occur, the process needs to involve
844 all three activities, and participants also need to pass through the three types of
845 conceptualisation – indicated by the ring of arrows. The model is intended to provide
846 a guide for facilitators working within a specific project goal, as is often the case in
847 NRM (e.g., seeking to incorporate Indigenous perspectives into climate change
848 adaptation policy). The process should start from the number one arrow shown at the
849 ‘open conceptualisation’ stage and move towards the ‘specific thinking stage’

850

851

852 Figure 3

853

854 Feedback is an essential part of all stages of the cycles in Figure 3, and particularly for
855 ‘specific conceptualisation’ and ‘synthesis of thinking’. Visual products derived from
856 the ‘open conceptualisation’ stage can be useful in guiding feedback for ‘specific
857 conceptualisation’ and ‘synthesis of thinking’ – to draw participants’ attention to
858 certain topics or themes. For example, photographs – derived from PGP – that
859 represent particular themes (to participants) – can be shown to participants at the
860 ‘specific conceptualisation’ stage, to focus attention on a particular issue, and also to
861 gain responses from other participants on that topic. The visual feedback can be used
862 in a variety of ways, and can lead towards clearer reflection of underlying values and
863 beliefs and thus ‘deeper levels’ of learning; that is double and/or triple loop learning
864 (described in Section 2.1). This process is in line with the claims of Leeuwis *et al.*
865 (2002:459) that ‘*developing and organising feedback in visual forms can serve a*
866 *range of purposes in social learning processes*’.

867

868 'Synthesis of thinking' is conceptualisation that is needed by a group working towards
869 developing collective thinking on an issue – often with a view to communicating
870 messages to other stakeholders. Stakeholder responses (to these messages) can also be
871 taken back to communities/groups in the form of feedback (e.g., video summaries) to
872 open up communication channels. It is important to keep in mind that this 'synthesis
873 of thinking' is not static and is always changing. Additionally, as Roling (2002)
874 suggests, it must be recognised that actors may be able to collaborate to reach
875 'collective cognition', and their perspectives may overlap, but these are not shared
876 completely and differences will remain.

877

878 In using the model in Figure 3, the stages in the outer cycle can be revisited in any
879 order – but 'open conceptualisation' should always occur first, and more 'specific
880 conceptualisation' later. It is also important to note that conflict and debate can play
881 an important positive role in any of these stages if handled well. As Leeuwis (2000)
882 emphasises, facilitators can strategically attempt to negotiate conflicts and sensitive
883 issues among certain participants to reach beneficial and sustainable agreements.

884

885 The distinction between strategic and communicative rationality (see Section 2.2) will
886 not always be clear in learning processes. Like Groot and Maarleveld (2000) we
887 believe these types of rationality can be highly intertwined and often complementary.

888 We realised during this study that although our overall research intent was
889 'communicative rationality', elements of 'strategic rationality' played a role,
890 especially during initial specific conceptualisation and synthesis of thinking, when
891 directed interaction can assist the process.

892

893 *6.8.2 Indirect benefits of visual techniques for research*

894

895 Our work with visual techniques revealed some unexpected features of both the
896 techniques and the visual products. For example they provided invaluable means of
897 recording and storing information from field sites, and also irreplaceable records of
898 raw data that can be referred to at any future time. Photographic and video images
899 were regularly used to refresh memories of participants' names and faces, language
900 and places, and plants and practices relating to NRM. Video was particularly useful in
901 allowing researcher/s to act reflexively, and to record verbal and visual field diaries of
902 their ideas and observations of the day. These records often comprised part of the data
903 analysed and were also used at later stages to verify recollections and interpretations,
904 and to recall and understand possible researcher bias, and the evolution of ideas and
905 theory.

906

907 **7. CONCLUSIONS**

908

909 Our study provided new insights into the effectiveness, complementarity and use of
910 visual techniques in enhancing learning – in inquiry among remote Indigenous people
911 on issues in the planning of local NRM. Visual techniques had strengths in engaging
912 participants; encouraging unrestrained and lateral thinking; allowing opportunities for
913 self-expression and reflection; and exposing the perspectives of other community
914 members. We advise these techniques are best used with verbal approaches, and with
915 awareness and reflexivity. In general, the techniques were valuable in helping to
916 facilitate learning, although techniques varied in their utility for different purposes
917 and in different cultural and physical circumstances.

918

919 Key requirements for facilitators using these tools are flexibility, openness and
920 resourcefulness. As mentioned by Pauwels (2004: 50), practitioners utilising
921 participatory visual techniques such as video (whether researchers, or separate
922 facilitators), have to play a 'steering key role' in directing the process. This may be in
923 contrast to other situations where outsider facilitators play less of an active role.
924 Visual techniques can be invaluable to facilitators here, in helping participants focus
925 on stages of learning and specific topics, and to provide activities that encourage
926 deeper reflection and development of collective thinking. Such guidance needs to be
927 done with sensitivity, reflexivity and awareness, and in a way that is inclusive of local
928 people, their perspectives and their needs for sustainability. The model (Figure 3) was
929 developed to strengthen awareness in facilitators of these requirements, and to
930 emphasise the need to be cognisant of three important types of conceptualisation
931 when using these techniques.

932

933 We found visual techniques useful in a wide range of development situations in
934 remote regions. While modern IT-based equipment can be very powerful, we were
935 able to adapt and use quite simple techniques (such as rich picture diagramming)
936 valuably in the widest range of applications. It was found that modern video and
937 photo techniques can be learned relatively easily today, but that they can have
938 limitations in remote areas. Apart from their other benefits, video, diagrams, photo
939 and other images were very valuable as a record of all research activities, and these
940 media were a strong benefit in data collection and analysis in remote field locations.

941

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943

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949

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Appendix A Summary of relative effectiveness of main visual techniques in enhancing learning and communication.⁴

VV = very effective in Vietnam, v = moderately effective.

AA = very effective at Australia, a = moderately effective

[-] = not effective / or not used (see Table 1) at a site

Note: Some techniques were used more frequently than others at different sites, so Table 1 should be referred to in conjunction with this table.

| | RPD | Photo elicitation | PGP | Video statements | Video /photo summaries | Hypermedia DVD |
|--|------|-------------------|------|------------------|------------------------|----------------|
| 1) ENGAGING AND SCOPING | | | | | | |
| a) Enhancing researcher engagement | | | | | | |
| Help build rapport & trust | vAA | va | VVAA | va | VVa | VVAA |
| Help break language and cultural barriers | vAA | va | VVa | VVa | VVa | VVAA |
| Help communicate research & concepts | – | VVAA | – | – | va | va |
| Engage & interest participants | vAA | va | va | VVAA | VVAA | VVAA |
| Allow a way to study with participants | vAA | va | VVAA | VVa | va | vAA |
| b) Strengthening community spirit and capacity building | | | | | | |
| Foster optimism about community and future | va | va | | va | VVa | va |
| Build confidence & empowerment | vAA | – | VVAA | VVAA | va | VVAA |
| Provide exposure and skills in technology | – | – | va | VVa | va | VVAA |
| c) Improving researcher and participant understanding of local issues | | | | | | |
| Elicit responses and discussion | vAA | VVAA | VVAA | VVa | VVa | VVAA |
| Provide insight into underlying core values | VVAA | va | VVAA | va | – | va |

⁴ Although [the table in Appendix A](#) provides an overall indication of the relative merits of techniques in each country for many purposes; the pros and cons of each technique were not always consistent.

Deleted: Table 3

| | | | | | | |
|--|------|------|------|------|------|------|
| Encourage open & different thinking of issues | VVAA | va | VVAA | – | va | va |
| Provide insight into participant interactions, power differentials, representation | VVAA | va | va | VVAA | VVAA | va |
| 2) FOCUSING ON SPECIFIC NRM TOPICS | | | | | | |
| d) Facilitating group learning cycle (enhancing feedback, discussion, interaction and reflection) | | | | | | |
| Encourage discussion | vAA | VVa | va | VVAA | VVa | VVAA |
| Encourage interaction | vAA | va | va | VVa | va | va |
| Encourage reflection | vAA | VVa | VVAA | VVAA | VVa | VVAA |
| Encourage discussion/reflection on underlying values/norms/ behaviours | VVAA | VA | VVAA | VVAA | VA | VA |
| Provide voice to those often unrepresented | vAA | | VVAA | VVAA | VA | VA |
| Focus attention on topic areas | VVAA | VVAA | | VVa | VA | VVAA |
| Provide memory of social learning process | vAA | | va | VVa | VA | VVAA |
| Provide stimulus or feedback | vAA | va | vAA | VVAA | VVAA | VVAA |
| Promote visualisation of scenarios | VVAA | va | – | – | – | – |
| Verify interpretation of data (by researcher) | – | va | – | VVa | VVAA | VVAA |
| 3) NEGOTIATING AND COLLABORATING (FOR COMMUNICATION) | | | | | | |
| e) Enhancing communication between community / other stakeholders | | | | | | |
| Communicate perspectives within community | vAA | VA | VA | VVAA | va | VVAA |
| Communicate perspectives to non community | vAA | – | VA | VVAA | va | VVAA |
| f) Helping to develop a collective perspective | | | | | | |
| Allow deep and critical thinking and visioning together | vAA | – | – | va | va | VVAA |
| Summarise & revise collective perspectives | va | – | – | VVa | VVa | vAA |
| g) Providing an avenue to communicate to other stakeholders | | | | | | |
| Create awareness about local perspectives and issues among external stakeholders | AA | – | va | va | VVa | VVAA |

List of Figures

Figure 1. A man in Vietnam who expressed no interest in forest (or nature) during an in-depth verbal interview, chose photos only of vegetation when later involved in participant generated photography. The images were plants with cultural significance to him and his family. This photograph is in front of a reforested area that he often visits 'because it is peaceful'.

Figure 2. A woman in northern Australia using diagramming and sculpting to explain her view that 'Government [represented by elongated green play -doh] should come to the 'root' level to meet and discuss [climate change adaptation issues] with the community [yellow play doh circles]' – to enable future cooperation.

Figure 3. Model of key components (conceptualisation and activities) in facilitating deliberation for learning processes in NRM.