Conserving marine biodiversity and the role of individuals:  
A case study of Chek Jawa, Pulau Ubin, Singapore  
By  
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Abstract  

Marine biodiversity can be conserved through various means. In countries with marine parks, the mechanism and authority entrusted for the various tasks are clear. However, in countries where marine areas are not protected, the role of individuals becomes of greater importance in promoting awareness regarding marine habitats and life of ecological significance that should be protected for the benefit and enjoyment of future generations. This paper documents the role of a group of committed individuals and events that brought about the conservation of intertidal Chek Jawa, which was earmarked for reclamation. The about-turn by the Singapore government to defer the proposed land reclamation was proclaimed as the first time in its history that public opinion and field data provided by the public had helped to bring about a change in policy. This data was not provided by renowned marine scientists or academics but was collected by a group of individuals and students committed to preserving nature, and presented to the government without recommendations to help it make a decision.  

Introduction

Like the legendary mountain-top Shangrila that comes into rare view with the lifting of the shrouding mists and clouds, the marine wonderland of Chek Jawa (CJ) reveals its full glory to fortunate visitors for a few hours with each low spring tide (Figure 1). It disappears beneath the waves again as the tide rises only to reveal a new assemblage of marine life with the following low spring tide. This constantly changing face is what brings repeat visitors to CJ again and again. They can be assured that each visit will represent a new experience. CJ has captured the heart of ordinary Singaporeans who are amazed that such a marine wonderland can be so close to their doorstep and yet lay ‘undiscovered’ for so long. This wonderland was nearly lost to reclamation if not for the efforts of mainly individuals who came together as ‘Friends of CJ’ in the ‘Save CJ’ campaign.

This paper documents the efforts and activities of ‘Friends of CJ’ as well as others in saving CJ, and discusses the importance of individuals in conserving marine biodiversity, even in countries without a marine park system. Although there are five designated marine parks totaling 500ha, managed by the Agri-food and Veterinary Authority in Singapore, these parks are for rearing commercial fish (Ministry of Environment, Singapore 2000). Unlike most other countries, the marine parks in Singapore are not for protecting and conserving marine life. Sometimes individuals can
achieve what organizations cannot, because of their freedom on act on their own and their willingness to take responsible for their actions. Organizations on the other hand are constrained by group agenda and responsibilities.

**Background**

In 1992, the government of Singapore announced the proposed plan to reclaim Chek Jawa located at the eastern tip of Pulau Ubin (Figure 2). The plan was confirmed in the Draft Concept Plan of 2001 with the announcement on 1 January that the intertidal area of CJ was to be reclaimed for military use (URA 2001).

![Figure 2. Proposed land reclamation of Chek Jawa, Pulau Ubin, Singapore](image)

On 22 January 2001, the rich intertidal marine life of the wetlands was discovered by Joe Lai, a nature lover, during a fieldtrip with students (Figure 3). This rich biodiversity was raised by him during a forum on 11 May 2001 organized by Urban Development Authority of Singapore (URA) chaired by the Minister for National Development (MND). This issue was pursued by the print media and the first report was published on 3 June by a Chinese newspaper, followed soon by Straits Times report on 8th July (*Chek out this hidden Eden*) and 16th July (*CJ’s natural beach should be preserved*). In response, URA in a letter to the Straits Times on 27 July explained that ‘The Housing Development Board had commissioned a study to determine the impact of the reclamation on dugongs. The study concluded that the sea grass in the area is patchy and not abundant, and the area does not appear to have a resident population of dugongs. Hence, the reclamation would not have any significant impact on a dugong population. In addition, the study concluded that the area does not have any established coral reefs or reef communities, nor would the conditions favour their development’
Conserving Biodiversity and the Role of Individuals in Saving Chek Jawa

The explanation given by URA was rejected by nature lovers familiar with the rich biodiversity of CJ, and questioned the adequacy of the terms of reference in the EIA, which was not made public. An awareness campaign by ‘Friends of Chek Jawa’ through road shows, media and websites began. On the same day in which the URA letter was published, the first TV coverage on CJ was screened in Mediacorp Channel 8 Chinese Frontline Programme, and a week later CJ was featured in Channel News Asia Assignment Programme. Journal articles by Chua et al (2001, Lai (2001), Lum (2001) and Sivasothi (2001) complemented by media reports and websites on CJ quickly followed (Table 1).

Table 1. Media reports, journal articles and websites on Chek Jawa, 2001-2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Announcement/Reports/websites</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 June 01</td>
<td>First media report on CJ by ZaoBao’s Ye Xiao Zhong</td>
</tr>
<tr>
<td>8 July 01</td>
<td>Straits Times (ST) published its first CJ article ‘Chek out this hidden Eden’</td>
</tr>
<tr>
<td>10 July 01</td>
<td>CJ website on the internet</td>
</tr>
<tr>
<td>16 July 01</td>
<td>ST published letter ‘Chek Jawa’s natural beach should be preserved’</td>
</tr>
<tr>
<td>27 July 01</td>
<td>ST published URA’s letter ‘Chek Jawa reclamation decided after careful study’</td>
</tr>
<tr>
<td>27 July 01</td>
<td>First TV coverage (in Chinese): CJ featured in Mediacorp Channel 8 ‘Frontline Programme’</td>
</tr>
<tr>
<td>28 July 01</td>
<td>ST published letter ‘Destruction of Chek Jawa will be a loss for all’</td>
</tr>
<tr>
<td>2 Aug 01</td>
<td>CJ featured in Channel News Asia’s ‘The Assignment Programme’</td>
</tr>
<tr>
<td>5 Aug 01</td>
<td>EARTH-WORMS Website on the internet to post details of ecological survey</td>
</tr>
<tr>
<td>15 Aug 01</td>
<td>TODAY letter by Joy Frances ‘Is there life on this stretch?—Nature lovers intrigued but HDB not convinced’</td>
</tr>
<tr>
<td>16 Aug 01</td>
<td>TODAY letter by Sivasothi ‘Exciting finds at Pulau Ubin’</td>
</tr>
<tr>
<td>17 Aug 01</td>
<td>TODAY letter by Tan Choon Ming ‘Sad tale of Chek Jawa—Don’t we want to keep this wetland for our children’</td>
</tr>
<tr>
<td>7 Sept 01</td>
<td>Nature Watch Journal featured several articles on CJ (Vol. 9(3))</td>
</tr>
<tr>
<td>15-16 Sept 01</td>
<td>Asian Geographic featured CJ in the Exhibition at SUNET City in conjunction with World Animal Day</td>
</tr>
<tr>
<td>20 Sept 01</td>
<td>Asian Geographic Journal (Sept-Oct issue) featured a 14-page article on CJ by Sivasothi.</td>
</tr>
</tbody>
</table>
The media blitz was complemented by guided walks, exhibitions, road shows and a series of public talks which brought the marine life of CJ to the heartland of the island state (Table 2).

Table 2. Guided walks, exhibitions, talks and others on Chek Jawa 2001-2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>May-Aug 01</td>
<td>Guided walks to CJ, many of participants later played active roles in the CJ issue.</td>
</tr>
<tr>
<td>7 Sept 01</td>
<td>Public education weekend at CJ organized by Raffles Museum Biodiversity Research</td>
</tr>
<tr>
<td>12 Sept 01</td>
<td>Talk on ’Pulau Ubin-Treasure Island’ at Ang Mo Kio Library</td>
</tr>
<tr>
<td>15-16 Sept 01</td>
<td>Asian Geographic featured CJ in the Exhibition at SUNTEC City in conjunction with World Animal Day</td>
</tr>
<tr>
<td>21 Sept 01</td>
<td>Talk on CJ to students at National University of Singapore (NUS)</td>
</tr>
<tr>
<td>22 Sept 01</td>
<td>Guided walk to CJ for NUS</td>
</tr>
<tr>
<td>26 Sept 01</td>
<td>Talk on ’Tanjung Chek Jawa’s Marine Treasures’ at Ang Mo Kio Library</td>
</tr>
<tr>
<td>7 Oct 01</td>
<td>CJ Exhibition at Singapore Zoological Gardens</td>
</tr>
<tr>
<td>15 Oct 01</td>
<td>A talk on CJ to HSSE, NIE</td>
</tr>
<tr>
<td>18 Oct 01</td>
<td>Visit to CJ by HSSE, NIE staff and family</td>
</tr>
<tr>
<td>19-20 Oct 01</td>
<td>RMBR organized the largest ever turn out for nature walks in the history of Singapore, about 1,000 visitors</td>
</tr>
<tr>
<td>22-23 Oct 01</td>
<td>Photo-exhibition of CJ at Raffles Girls’ School</td>
</tr>
<tr>
<td>24 Oct-9 Nov 01</td>
<td>CJ Exhibition at Temasek Polytechnic</td>
</tr>
<tr>
<td>27 Oct 01</td>
<td>A talk on CJ at Kinokuniya Bookstore, Ngee Ann City</td>
</tr>
<tr>
<td>30 Oct 01</td>
<td>A talk on CJ at Department of Biological Science, NUS</td>
</tr>
<tr>
<td>1-18 Nov 01</td>
<td>CJ Exhibition at Singapore Science Centre Life Sciences gallery as part of the ‘Web of Life’ Exhibition</td>
</tr>
<tr>
<td>5 Nov 01</td>
<td>A talk on CJ at Woodlands Regional Library</td>
</tr>
<tr>
<td>12-25 Nov. 01</td>
<td>CJ Exhibition at Marine Parade Community Library</td>
</tr>
<tr>
<td>18 Nov 01</td>
<td>A talk on CJ at Singapore Science Centre</td>
</tr>
<tr>
<td>16 Dec 01</td>
<td>A talk on CJ at the Singapore Science Centre</td>
</tr>
<tr>
<td>9-10 Jan 02</td>
<td>RMBR workshops for CJ volunteer guides I: NParks staff</td>
</tr>
<tr>
<td>22, 24 Jan 02</td>
<td>RMBR workshops for CJ volunteer guides II: NParks staff</td>
</tr>
</tbody>
</table>

Source: Friends of Chek Jawa

Individually and nature groups appealed to the authorities to reconsider the decision to bury the rich marine life. An inventory of the marine life and an ecological survey along six transects was carried out to document the marine life to be lost.

Results of the surveys were sent to the government. In damage control, Nature Society of Singapore (NSS) relocated sea grass to the shallow seas in front of Ubin Lagoon Resort and the sea off Tanah Merah. Nature walks were organized by the RMBR
so that Singaporeans would realize the part of their natural heritage that would be lost forever. The response was the largest ever turn out for nature walks in the history of Singapore when a total of about 1,000 visitors came on that Friday and Saturday to bid farewell to CJ (Figure 4). Something was brewing when on 2 December the Senior Parliamentary Secretary and Permanent Secretary of National Development, and URA Board Members visited CJ. The event was hosted by NParks, assisted by RMBR staff, students and volunteers.

![Figure 4](image.png)

**Figure 4. Public walk bidding farewell to Chek Jawa, 19-20 October 2001**

In response to the appeals and evidence presented on the rich biodiversity of CJ, and the ‘turun ke padang’ by decision-makers, on 29th December, the Minister of National Development invited groups/concerned individuals to announce the deferment of reclamation at CJ (Appendix I). The group (*Friends of CJ*) was then invited to submit an assessing of the various options of land reclamation for the rest of Pulau Ubin. The minister recalling his first visit to CJ and witnessing a father explaining the marine life to his son ‘*it struck me that what we are doing is really not for us, it’s for our children. We are really custodians of this land for future generation*’ (*The Straits Times* 15/1/02).

The caveat remains though and that when land is needed for development, the reclamation will proceed. It is important to put a high value for CJ so that any hint of its loss will be strongly resisted. And this value is tightly linked to the marine life, which was in danger of being loved to death by the hordes of visitors (Figure 5). The CEO of NParks was so concerned about this possibility that he warned that it would be tragedy if the public ruins what is going to be saved for them (*The Straits Times* 29/12/01). A visitor management system with the help of volunteers was set up by NParks to control visitors and minimize impacts. Soon after, *Friends of CJ* started a study on the impact of trampling on carpet anemones.
The assessment was submitted on 2nd January 2002. The report also included a proposal by Joe Lai to create a marine park at CJ. He wrote that ‘For some, CJ is a giant touch pool, a playground, and a poet’s corner. For others, Chek Jawa is a natural wonder with huge potential for education and research. It is a pity that such a wonder of nature may soon be lost. If there is any way in which Chek Jawa can be conserved for the enjoyment of future generations of Singaporeans, then every attempt should be made to explore this possibility. We may be judged harshly by future generations of Singaporeans if we fail to do so’.

The proposal suggests that CJ be protected and gazetted as a Marine Park under the stewardship of the NParks, for recreation, education, conservation and research. This will be a first for Singapore to have a conservation area designated as Marine Park - a very natural feature for an island nation. Among the many suggestions are a visitor centre (House Number One to be renovated), low concrete boardwalks, viewing tower and a landing pontoon. Although CJ had been saved, the proposed reclamation for the rest of Pulau Ubin was slated to begin at the end of 2001. The contractor had already started preliminary preparations for reclamation.

Nature lovers in Singapore were caught completely by surprise when on 14 January 2002 the government announced that land reclamation for the rest of Pulau Ubin had been deferred for 10 years. There was overall jubilation and tears flowed freely, even among non-Singaporeans. CJ had bonded Singaporeans and non-Singaporeans in a common cause. Friends of CJ partly anticipated the decision but kept the optimism to themselves as they had received an email on the 4th of January thanking them for their CJ submission, which was considered well thought out, was being considered and that there is a good chance that the proposals will be adopted in total. Although CJ was not declared a marine park, it was beyond the wildest dreams of many nature lovers who rallied to the
In the press release, (Appendix II), MND explained that a team made up of experts from the National Institute of Education of Nanyang Technological University, the Raffles Museum of Biodiversity Research in NUS and other interested individuals submitted a report which highlighted that in order to ensure the survival of the marine ecosystems at CJ, reclamation works on Pulau Ubin should be put off. It added that research and surveys will also be conducted to monitor the health and condition of the marine flora and fauna at CJ. More importantly, MND considers the episode as a positive example of consultation and collaboration between the Ministry and stakeholders which has resulted in a win-win situation. Mr. Mah, however, said that his ministry was not ready to discuss the gazetting of CJ as a nature area yet and will leave that decision to the next Concept Plan to be reviewed in 2011 (The Straits Times 15/1/02). The chronology of events starting with the announcement of land reclamation in 1992 and ending in the announcement of deferment of land reclamation in Pulau Ubin is documented in Table 3.

Table 3. Selected chronology and events of Chek Jawa, 2001-2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>Government approved plans to reclaim Pulau Ubin, including Chek Jawa (CJ)</td>
</tr>
<tr>
<td>Jan 01</td>
<td>Announcement in Draft Concept Plan 2001 to reclaim Pulau Ubin and Chek Jawa</td>
</tr>
<tr>
<td>11 May 01</td>
<td>CJ issue raised by member of audience during public forum organized by URA and chaired by Mr. Mah Bow Tan, Minister of National Development</td>
</tr>
<tr>
<td>22-24 June 01</td>
<td>Nature Society of Singapore (NSS) damage control experimental transplanting of marine plants to the sea off Ubin Lagoon Resort</td>
</tr>
<tr>
<td>22-24 July 01</td>
<td>NSS experimental transplanting of marine plants from CJ to the sea off Tanah Merah</td>
</tr>
<tr>
<td>27 July 01</td>
<td>ST published URA’s letter ‘Chek Jawa reclamation decided after careful study’</td>
</tr>
<tr>
<td>5 Aug 01</td>
<td>Preliminary ecological and geomorphological survey of CJ</td>
</tr>
<tr>
<td>20-21 Aug 01</td>
<td>RMBR organized expedition to collect marine life at CJ</td>
</tr>
<tr>
<td>21-22 Aug 01</td>
<td>Ecological survey of CJ on biodiversity of surface and subsurface marine life, leveling along transects, sediments of habitats collected for analysis and sampling points recorded by GPS</td>
</tr>
<tr>
<td>4 Oct 01</td>
<td>A checklist of the fauna of the intertidal ecosystem of CJ P. Ubin submitted by RMBR, NUS to the Nature Conservation Branch, Nparks Board, MND.</td>
</tr>
<tr>
<td>2 Dec 01</td>
<td>Visit to CJ by Senior Parliamentary Secretary, National Development, Permanent Secretary, National Development and URA Board Members. Event hosted by NParks, assisted by RMBR staff, students and volunteers.</td>
</tr>
<tr>
<td>20 Dec 01</td>
<td>Mr. Mah Bow Tan invited groups/concerned individuals to announce deferment of reclamation at CJ and invited feedbacks on the rest of the proposed Ubin reclamation.</td>
</tr>
<tr>
<td>26 Dec 01</td>
<td>An invitation to selected individuals from URA to submit reclamation options, as an individual or as a group, for Pulau Ubin. Proposal submitted as a group.</td>
</tr>
<tr>
<td>27 Dec 01</td>
<td>ST published NPark’s press release ‘New rules for visiting Chek Jawa’</td>
</tr>
<tr>
<td>End Dec 01</td>
<td>Land reclamation due to start at Pulau Ubin</td>
</tr>
<tr>
<td>2 Jan 02</td>
<td>Group submission of report and CD-ROM on reclamation options for Pulau Ubin</td>
</tr>
<tr>
<td>14 Jan 02</td>
<td>Press Release by MND on 10 year deferment of land reclamation at Pulau Ubin</td>
</tr>
<tr>
<td>15 Jan 02</td>
<td>ST reports on deferment of land reclamation at Pulau Ubin. Mr. Mah Bow Tan, MND mentioned custodianship (stewardship) and the CEO of URA BG (NS) Tan Yong Soon referred to the process leading to the change in decision as ‘not a turning point in government policy but as a good model of public consultation at work’</td>
</tr>
</tbody>
</table>

Source: ‘Friends of Chek Jawa’

Soon after the 14th January press release by MND, Chua (2002) brought out a coffee table book on Chek Jawa, which documented in images its biodiversity and the events leading to it being saved. To help visitors identify the myriad life there, a
A guidebook on Chek Jawa was put together by Tan and Yeo (2003) in association with MBR, with contributions by volunteer guides of CJ.

**Mapping and Ecological Survey**

The mapping, marine life survey, ecological survey and monitoring of CJ were carried out by individuals in their own capacity although many of them were members of nature groups or research institutions.

A need to know more about CJ resulted in a preliminary habitat and geomorphologic map, with a description of the surface and dynamics of the low-tide lagoon and cuspate bars. The map showing the distribution of sea grass and the intertidal morphology was compiled from field mapping using DGPS (Figure 6), supplemented by interpretation of satellite images and aerial photographs. The maps served as a base map for planning the ecological survey.

In the ecological survey, a preliminary survey was carried out on 5 August 2001 during which six profile lines were laid down, and the actual survey was carried out early in the morning on 22 August (Figure 7). The ecological survey compiled biodiversity of surface and subsurface marine life, leveling along transects collection of marine life and sediments of habitats for analysis. All sampling points were recorded by GPS. The marine life collected was sent to RMBR. About the same time, another group of volunteers collected marine life at CJ.
Ecological survey along six transects

Members of survey team 4 sieving

Quadrat sampling of surface/subsurface marine life

Reccy on 22 July 2001 to lay down transects or ecological survey

Figure 7. Ecological survey carried out by volunteers, 22nd August 2001

The ecological surveys by volunteers were captured by Eric Lim in a documentary ‘Remember Chek Jawa’. It chronicles the efforts of individuals from all walks of life who volunteered to help the biodiversity survey, one of several efforts that would provide feedback to the government. Eric Lim was particularly inspired by their efforts to participate in a tiring, muddy and apparently incomprehensible biodiversity survey, at a time when all hope had virtually been lost. At that time, most felt that this record would simply serve as an obituary for CJ, as the reclamation was to begin in just a few months. Later they were elated to be proven wrong.

Developing a GIS Database for Chek Jawa

The geomorphological and habitat maps and ecological data collected were integrated into a preliminary GIS (Raju, 2002) and used for exhibitions and talks on CJ. Additional data were later developed to build the various GIS layers (Figure 8). Developing the CJ geo-database is ongoing and recently a dense network of elevation points has been collected using total station to assess the impacts of a rising sea on intertidal lagoon and cuspat e bar of CJ. The CJ GIS has no single ownership; it belongs to all.
Monitoring Impacts of Trampling on Carpet Anemones

In the early stages when CJ was open to the public, there was concern about the effects of trampling by visitors and this led to a monitoring study by ‘Friends of CJ’, with volunteers from mainly NIE doing the monthly carpet anemone monitoring. Monitoring covered 73m length across the lagoon and 85m length along the bar. The methodology for the monitoring is shown in Figure 9. Monitoring started in August 2002 and ended in July 2004.
Figure 9. Methodology of carpet anemone monitoring in CJ

Over the two year period of monitoring the number of carpet anemones, especially on the bar, surprisingly remained nearly the same, showing their resilience to trampling. Part of the reason could be that the anemones on the bar were clearly visible to the visitors who had been instructed by guides to avoid stepping on them. The preliminary result of the survey including an evaluation on the reliability of the data collected had been reported by Teh et al (2004). The total anemone count on the lagoon was about 35 and that on the bar about 80. Stayers, quitters and newcomers were identified (Figure 10).
Managing Chek Jawa

A Chek Jawa Working Group was set up soon after with representatives from NSS, Singapore Environment Council, RMBR and NUS. NParks took over the management of CJ and nature walks, in which participants have to register months in advance, were organized during low spring tides. Members of staff from NParks and volunteer guides were trained by RMBR with the help from ‘Friends of CJ’. The volunteer guides play a vital role in helping to mange the wetlands. CJ immediately became a ‘must visit’ place for Singaporeans, and the myriad of marine life there surprised many who never imagined that such a marine paradise could exist so close to their doorstep and wonder how such a wonderland could elude ‘discovery’ by even nature lovers for so long.

HSBC adopted CJ and contributed S$800,000 towards Pulau Ubin conservation fund for setting up of the Ubin-HSBC volunteer club and the HSBC gallery at the visitor centre. In early 2007, CJ was closed to the public after heavy rains in December 2006 and January 2007 caused massive death of marine life, especially the carpet anemones. Freshwater rains and discharge from Sungai Johor upset the wetlands' saltwater balance, and intertidal walks were stopped in March 2007 to let the wetlands recover. On 7th July 2007, the nature reserve with boardwalks, a viewing tower and a visitor centre costing the government S$7 million were re-opened to the public (Figure 11). The marine life was observed to be recovering slowly. Unlike before, visitors can conduct their own tour. However, those interested to go down to the intertidal areas during low spring tides still have to register for guided tours. Since 2002, more than 20,000 visitors have participated.
in guided walks and the boardwalk will allow visitors to see CJ on all days. However, those on guided walks must still register their interest.

Figure 11. New facilities built for visitors at Chek Jawa

It is ironical that the marine life of CJ saved from human actions of reclamation and trampling was nearly lost because of natural events of excessive rain. This make managers realize how little was known about the dynamics of CJ and the natural cycle of destruction and recovery of marine life there. Added to this complex process is that of global warming and potential impact on CJ and its marine inhabitants.

Discussion

In this section, I will touch on a few areas of generic interest before returning to CJ. These are on the role of research findings on policy formulation, the role of NGOs and individuals in marine biodiversity conservation and on what can be learnt from CJ.

Research and management policies

Although it is obvious that to manage an area or a particular resource well we must know the area and the resources found within it, it is surprising that too often attempts at management are carried out with insufficient knowledge. At times, there is little baseline
or longitudinal data to guide how an area should be protected. Usually, the authority
entrusted with managing the area does not have a research arm, capacity, or funds to do
the research to understand the ecological processes operating. It may also focus more on
management and not on scientific issues. How then can such a problem be addressed.

It is often said that scientific research should be left to scientists, management left
to managers and policies left to senior administrators and decision makers. Hence, it can
be argued that research should be carried out by scientists to seek the truth and be without
any given agenda. There is independent research, collaborative research, joint research,
commissioned research and in-house research. Each has its implications. Independent
research may not be welcomed in a protected area because it may not fit in with the
agenda of the approving authority. On the other hand scientists may not want to conduct
research in such areas because of the often long delay in getting approval and the
conditions imposed on them. In-house research would be ideal as objectives would be
more targeted towards the needs of the authority. Where funds are available, consultants
can be commissioned to carry out the research. Findings from in-house and
commissioned research for obvious reasons usually influence decision making and have a
better chance of being translated into policies.

Scientists conducting independent research should just present their findings and
in my opinion not try to influence policies. Leave the scientific facts to speak for
themselves and researchers should not feel disappointed when their findings are not
translated into policies. In addition, research findings can be conflicting and confusing to
policy makers. There is good research methodology and bad research methodology. And
there is good and poor analysis and interpretation of data. Like Climate Change, there are
also uncertainties. Policy formulation is a complex process and has many ramifications,
affecting people and their livelihood. Scientists should not try to carry this extra burden
and leave policy formulation to others.

Role of NGOs and the public in conservation management and planning

It is crucial that planning balances development and environment and that the planning
process be inclusive and seeks the help of NGOs, stakeholders and the public. The
planning process must have their confidence, and allows them to participate in all stages
of planning. The inclusive approach is new to both government and people and it will
have initial teething problems. The people will take time to respond to this new
responsibility and play their role properly. Patience is required.

The CJ saga would probably have a different outcome if not for the inclusive
planning approach in Singapore, in which transparency and public consultation make
possible for people to know what is happening and provide insightful feedback. Of
course, some will argue that more can be done in terms of transparency and public
consultation.

The public is encouraged to participate at all stages of planning. Even when the
Draft Master Plan is exhibited, the message is that what is presented is not final, and that
the public is invited to share their views, opinions and ideas so that the plan can be refined. The public should be realistic regarding their role. Their feedback may or may not be acted upon or only partially accepted. The then Prime Minister Mr. Goh explained that government does listen to feedback from the public but that government cannot be run based just on feedback, as on any one issue there are 101 opinions and many interested parties (*The Straits times* 19/8/2002).

*The public and feedback*

The mechanism for public feedback is usually in place for most countries and despite the usual invitation by government to form a partnership with the community and encouraging the public to take ownership of their resources and environment, there are questions whether the public or middle level managers of government are ready for the new paradigm (Teh 2003). The skeptics may view the call for a partnership to be a trick to flush out environmental dissidents; others may argue why do the work for them or complain that there is no money in it. It may not be part of the culture to be involved or that they may seriously question their ability to make a meaningful contribution. This may explain the usual poor feedback received in some countries. On the other hand, feedback may be looked upon by some middle managers as a nuisance, requiring the redrafting of plans and questioning about who knows best. Solicited feedbacks and unsolicited feedbacks may also be received differently. Feedbacks required by regulation may be better received than uninvited feedbacks.

*Role of individual in promoting awareness*

Useful data may be collected by the public who may set up their websites to report on their observations and post photographs, some of which may have a GPS position. Local residents have historical data and divers provide continual observations. School groups may also be a useful source of information. Authorities can help pool the data to be shared by all. The inclusive approach in tapping knowledge from the public helps build up local knowledge.

Those involved in management should be equipped with as much knowledge as possible about the area and resource they are managing and the policies and regulations applied. How best the required knowledge should be easily disseminated to them? The data derived from mapping, surveys, research and feedbacks should be integrated for easy retrieval and should be updated from time to time. A GIS database is usually the recommended means to integrate all the data. Capacity building within the organization is required and this often takes time and outsourcing may be the initial and temporary solution. In CJ, the initial GIS database was developed by individuals to be shared by all but a comprehensive database may be beyond the capacity of any individuals.

*Why was Chek Jawa ‘undiscovered’?*

Sivasothi (2001) questioned ‘*How did we miss CJ?’*, described by the then NSS president as a 'gift from heaven'. In recent debates on conservation in Singapore, the name CJ has
not been a familiar one. According to him, the reasons are numerous. The strategy generally adopted by nature groups have been directed to saving the whole island of Pulau Ubin, thus losing out on specifics like CJ. At the time, most of the expertise and interest in NSS lay with birds and mammals. Lack of public access to CJ was a significant problem, and the path land leading to the coast was marked ‘private property’. A map of Pulau Ubin published in the society's Nature Watch magazine does not reflect the true nature of the site. Ironically, the resettlement of these residents affected by the proposed land reclamation resulted in easy access to CJ. Although CJ was poorly known to NSS members, the local residents knew of its rich marine life, collecting sea horses for drying and harvesting shellfish from the intertidal mud. Marine life was also being collected for the aquarium trade. Fish traps dot the area and fish nets criss-crossed the mud flats. Chua (2002) lamented that divers had visited CJ but they were more interested in taking photos of marine life. They lost interest in the place because of the poor visibility. Too many threatening signage island-wide warning about trespassing and their consequences did not help. Some may have visited CJ during high tide and missed the wetland wonderland; others may have been there during low tide but failed to see the ecological significance because they did not believe their eyes. The mentality that the grass is greener across the hill and the water more blue on the other side of the sea was in play. A more simple reason may be that urbanized Singaporeans had lost their spirit of adventure and too few were venturing out to enjoy and explore nature areas. Hopefully, the discovery of CJ will help change this and reignite their exploratory spirit.

**Why the deferment?**

The press release to announcement the deferment of land reclamation at Pulau Ubin was considered the first time the government made a U-turn in reclamation issues. The New Straits Times (2/1/2002) was very close to the mark on the reason for the U-turn when it reported that It was a day the government proved itself responsive to public feedback, a day it showed itself open to the merits of persuasive argument from citizens, and that on the part of the CJ activists, they showed how to make their case and win it. On the internet, in the newspapers and in public forums, they pleaded their cause, passionately but rationally and with civility at all times. The URA CEO considered the CJ deferment as not a turning point in government policy but as a good model of public consultation at work, in which they partnered the government in a search to come up with alternative reclamation profiles (The Straits Times 15/1/2002). He considered what had happened in CJ as a good model to work on.

Some considered the decision as all about timing and that if it had happened 10 years earlier, the result would have been different, as the conservationists would have fought a lonely battle, their voices lost in a wilderness of booming economic growth, without public support and against an unsympathetic government. In an era of public awareness about state of earth’s health and the impacts of global climate change, attitudes from both sides had changed. And let us not forget about the individuals who fortuitously came together and help to save CJ.
Various people and organizations will look at the CJ story differently and ponders about the reasons for the U-turn. Some will claim that they role was the main reason for the deferment. Was it really about natural heritage and the new found respect for nature? Or, was it really still about economic benefits, about the potential billions to be reaped from biomedical research products from the marine life of CJ. The true reasons may never be known and the true story may never be told. Who were these ‘Friends of CJ’ and how did this group of individuals, many of whom met for the first time when brought together by Joe Lai on the wetlands of CJ on the 5th of August 2001, embarked on a ‘Save CJ’ campaign, trekked across the mud flats of CJ and travelled on many different journeys and helped bring about the U-turn by the government. Some of them have continued to promote nature appreciation and conservation and look forward to each low spring tide to happily spend their time exploring the intertidal flats around Singapore; others have gone back to what they were before the ‘Save CJ’ campaign; a few have moved on to other interests and the remaining few continue to tell their untold story of CJ. It will never be known whether CJ would be what it is today without ‘Friends of CJ’.

Conclusion

The Chek Jawa story has many lessons to offer on natural history, active citizenry and smart partnerships between government and people. The call to save CJ brought together brave, committed individuals of various nationalities, ages, experiences, training and backgrounds. ‘Friends of CJ’ selflessly lend their time and expertise for a worthy cause. Their vast pool of experiences, wisdom and contacts help to strategize an approach that is apolitical and non-confrontational, more acceptable to government, to plan a biodiversity, ecological and mapping survey, organize public walks, mobilize volunteers, enlist the help of media and bring the CJ issue to the public. The CJ saga also shocked Singaporeans and made them realize how little they know about marine life in Singapore and sparked off follow-up surveys of marine life in Beting Bronok, Sekudu, Cyrene Reef and Semakau among other places. The marine life there was equally fascinating as that found in CJ. Singapore is so much richer in its knowledge of marine biodiversity and for this it has to thank the individuals who came together as Friends of Chek Jawa.

Acknowledgement

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References

*The New Straits Times*, various issues
APPENDIX I

MINISTRY OF NATIONAL DEVELOPMENT PRESS RELEASE
DEFERMENT OF RECLAMATION WORKS AT TANJUNG CHEK JAWA

1. The Ministry of National Development (MND) has decided to defer the reclamation works at Tanjung Chek Jawa originally slated for the end of 2001. This will allow MND to discuss with the relevant experts on how best the marine life there can be protected. Chek Jawa is located at the eastern tip of Pulau Ubin.

2. Groups and individuals with special interest in Tanjung Chek Jawa have given MND detailed and insightful feedback since the area was first brought to public attention at the URA Public Dialogue on the Concept Plan 2001 this year.

3. The decision to defer the reclamation works at Chek Jawa comes after MND has carefully considered all public submissions and also following extensive consultations among various government agencies including URA, NParks and HDB. MND has also consulted with marine life experts from NUS and other institutions and societies.

4. This afternoon, Mr. Mah Bow Tan, Minister for National Development, met with some representatives of nature and biodiversity groups and some members of public who have shown strong interest in protecting the marine life in this area. The meeting was called to discuss the best option to protect the marine life at Chek Jawa. More details will be announced later after studying the various options.

5. With the deferment of reclamation works, the immediate need is to conserve biodiversity and prevent deterioration of the mudflats and injury to the marine organisms. Hence, we wish to advise members of the public that there is no longer an urgent rush to visit Chek Jawa.

6. NParks will put in place a system to manage the flow of visitors during low tide. Visitors will be advised to keep to the designated routes and refrain from collecting any plants or animals. NParks is also exploring with nature and biodiversity groups to provide guides. NParks will release more details at a later date.

7. We seek the cooperation of the public to protect the habitats and to ensure long-term enjoyment of this natural heritage.

MINISTRY OF NATIONAL DEVELOPMENT

APPENDIX II

MINISTRY OF NATIONAL DEVELOPMENT PRESS STATEMENT
DEFERMENT OF RECLAMATION WORKS AT PULAU UBIN

1. The Ministry of National Development (MND) has decided to put off the land reclamation works at Pulau Ubin for as long as the island is not required for development. This will allow Chek Jawa to be retained in its natural state. The rustic nature of Pulau Ubin will be preserved for as long as possible. The long-term planning intention for Pulau Ubin remains as stated in the Concept Plan 2001.
The reclamation works at Chek Jawa was originally scheduled to begin in Dec 2001. Since the middle of 2001, nature groups and individuals with special interest in Chek Jawa have highlighted the rich biodiversity of the area and provided insightful feedback.

On 20 December 2001, MND announced the interim decision to defer the reclamation to study how the reclamation profile at Pulau Ubin could be modified such that the marine life at Chek Jawa would not be adversely affected.

A team made up of experts from the National Institute of Education, the Raffles Museum of Biodiversity Research and other interested individuals submitted a report which highlighted that in order to ensure the survival of the marine ecosystems at Chek Jawa, reclamation works on Pulau Ubin should be put off.

The Nature Society, in a report coordinated by its conservation committee, came to the same conclusion. Both reports ascertained that if reclamation must be carried out, it should be limited to only a very small area of Pulau Ubin in order not to harm the fragile ecosystems at Chek Jawa.

MND has assessed that it is not cost-effective to reclaim such a small area and has therefore decided not to proceed with reclamation works at Pulau Ubin for as long as the island is not required for development.

In order to protect the marine life at Chek Jawa, NParks is setting up a committee comprising representatives from the Nature Society, Raffles Museum of Biodiversity Research and other experts to work out a comprehensive plan to maintain Chek Jawa’s unique ecosystem for the continued enjoyment of all.

Among other things, the committee will look into the provision of appropriate amenities like board-walks and trained guides. Research and surveys will also be conducted to monitor the health and condition of the marine flora and fauna at Chek Jawa.

Minister for National Development says, “Land in Singapore is scarce. There will always be competing needs for land for development and national security needs. The decision not to reclaim Pulau Ubin at the moment has been made only after we have weighed the trade-offs and carefully considered the land use implications. This episode is a positive example of consultation and collaboration between the Ministry and the stakeholders which has resulted in a win-win situation. The Government will continue to take a balanced and pragmatic approach to land use planning.”

MINISTRY OF NATIONAL DEVELOPMENT
14 January 2002