

# Exploring Mekong Futures for Vietnam

Enhancing Vietnam's capacity to improve the sustainability of the Mekong Delta.



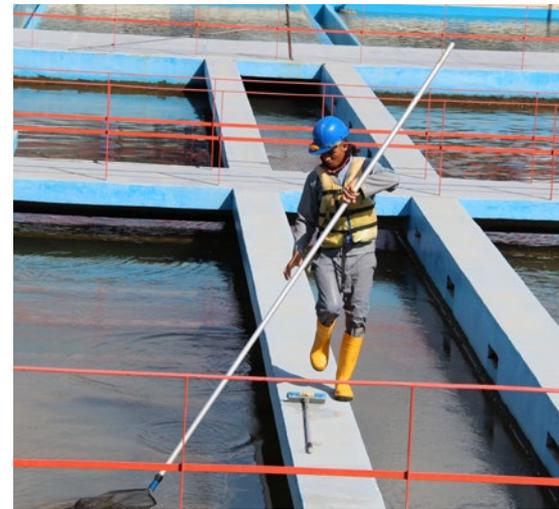
# The issue

The government of Vietnam has an ambitious vision for the Delta, promoting food security and a better life for farmers. However, climate change is projected to have significant impacts in the Mekong Delta as a result of changes in rainfall and sea level, increasingly exposing people in coastal communities to erosion, salt-water intrusion and storm surges. The Government plans to construct significant large infrastructure measures to control salt water intrusion.

# Our approach

The major upstream use of water in the Mekong River is for hydro-energy and fisheries. Downstream in the Delta, the dominant use is for irrigated agriculture (mainly rice) and shrimp production in ponds. The interrelationship between these competing demands is commonly termed the ‘water-food-energy nexus’. Working with Vietnamese researchers and government agencies, this project examined different scenarios of upstream energy production, water use and food production options. This integrated assessment of the possible futures for the water-food-energy security nexus will assist local and regional planning as well as strategic responses to large-scale trends and uncertainties such as population growth and future climate as well as security concerns at the national level in Vietnam. The project used well-presented scientific information to challenge current beliefs and assumptions in relation to rice production by evaluating a range of livelihood and development options.

The project was managed as a partnership between CSIRO, Can Tho University, the Southern Institute for Water Resources and the Ministry of Agriculture and Rural Development from 2010-2014.



## Key lessons for development

- The Vietnamese Government has ambitious plans for the Mekong Delta, however some provincial governments question the strategy to maintain and increase rice production, suggesting that it may not be the best use of land and water resources or the best livelihood option for people in all circumstances.
- Vietnamese rice exports have become increasingly relevant for global food security, however increasing salinity levels in the delta have reduced productivity, and declining rice production. Strategies that invest in large scale infrastructure as well as practices to introduce farming practices that are adaptive to higher saline levels are likely to be more effective than infrastructure only solutions.
- Well-designed participatory planning processes that are underpinned by science can lead to a change in beliefs by actors and encourages consideration of better targeted solutions to complex development challenges.

### DFAT-CSIRO Research for Development Alliance

This project was funded by the Research for Development Alliance, a strategic partnership tackling complex development challenges in the Asia Pacific region.

## Project partners

CSIRO, Can Tho University (CTU) College of Environment and Natural Resources, the Southern Institute for Water Resources part of the Vietnam Academy for Water Resources (VAWR), the Ministry of Agriculture and Rural Development (MARD), and the Australian Department of Foreign Affairs and Trade (DFAT).

# Key achievements

## OUR STORY

### What did the project deliver?

**Skills and knowledge** were improved across the research team, enabling local researchers to evaluate climate projections and future development scenarios for the Mekong Delta provinces of Vietnam. Significant time in-country provided the CSIRO team with valuable local perspectives and improved our ability to deliver fit-for-purpose products.

A salt water intrusion map of the Delta was produced, drawing on latest scientific evidence of trends in sea level rise. The map identifies optimal land uses under different development scenarios; and it provides an evidence base for decisions about water availability, agricultural development and energy production in the Delta.

### Participatory Planning Approaches

were introduced. Building on existing capacity in Can Tho University, the Mekong Futures project introduced a participatory learning process designed to identify a range of development options, beyond the status quo. The CHARL approach (Challenge and Reconstruct Learning approach) challenges current thinking by introducing alternative development scenarios and scientific evidence (including climate change projections), taking stakeholders through a more deliberative and engaging process to consider future development options.

**Scenario planning** was undertaken in the project looking at the potential impact on livelihoods of different energy production options upstream and water use options downstream. This integrated assessment of the possible futures for the water-food-energy security nexus was designed to provide improved evidence to support the development planning in Vietnam's Mekong Delta and the national food security plan.

The approach challenged current beliefs, posing alternative development scenarios that could deliver greater benefit to poor rural communities by opening up development planning to a more diverse range of agricultural production options.

### How is it being used?

Outputs of the intrusion map and scenario planning are being used by decision makers. For example the evidence suggests that rice/shrimp production systems remain relevant into the future under different scenarios, but that in some circumstances, alternative agricultural commodities may be more optimal than rice (e.g. salt tolerant crops and high value horticulture). Small scale irrigation infrastructure, together with cooperation between provinces on water use and management, would have greater impact on lifting rural communities out of poverty than large scale irrigation only.

In a situation where there is limited cross-border / provincial coordination, bringing stakeholders and decision makers together through the CHARL process, provided a forum for informed debate about the impact of upstream water use and river development, on people who depend on the water downstream.

Future climate scenarios were established to assist local stakeholders better understand the impact of change in the region. By introducing a practical tool to enable the consideration of climate impacts on development, the workshops promoted a scientifically robust process for local officers to consider the most appropriate investment decisions.

Local decision makers have indicated that they will apply these scenarios in future decision making.

### What impact did the project have?

The CTU team is now applying these refined diagnostic skills in other work with central and provincial governments, and international donors. In addition they are combining the scenario planning and participatory approaches with new scientific evidence developed through the project into new decision support capability. CTU researchers are currently working on a number of projects with local and international partners planning agricultural development in the Delta, including Ministry of Agriculture, provincial Departments of Agriculture, the Dutch Master Plan for the Delta, the Mekong River Commission, World Bank and USAID.

The participatory approach has led to sharing data/information between participants and provinces regarding water management issues. It has also facilitated cross learning so that decision makers are better able to understand and take account of situations in other provinces in the Mekong Delta, enabling a more systematic approach to solutions to be considered.

Outputs from this process have informed and enabled local decision makers to support communities to trial new rice varieties in the context of changing climate in the Mekong Delta, and to also consider a broader mix of commodities.

# Impact Pathway

The project aimed to influence beliefs about resource management in the Delta through the deliberative consideration of scientific evidence. To achieve this, the research team developed an Impact Pathway consisting of three linked phases (Fig. 1a). Phase 1 focused on ‘capacity building’. This enabled the allocation of resources and the development of plans, agreements and new projects through Phase 2 ‘policy and program development’. Following on from Phase 2, Phase 3 involved ‘implementation, adoption and scaling out’. These phases would cumulatively build the adaptive capacity of the project stakeholders. However, while Phase 1 encompassed the project’s activities (solid line), Phases 2 and 3 were out of the project team’s direct control (dashed line). Consequently, the Impact Pathway was clear for Phase 1, but less so for Phases 2 and 3.

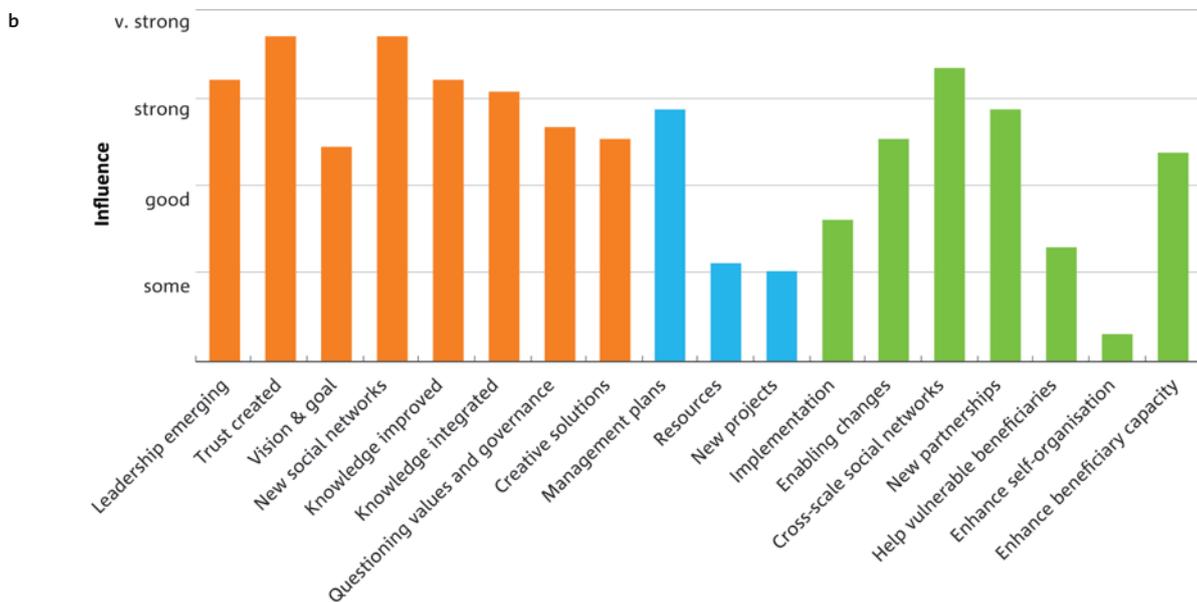
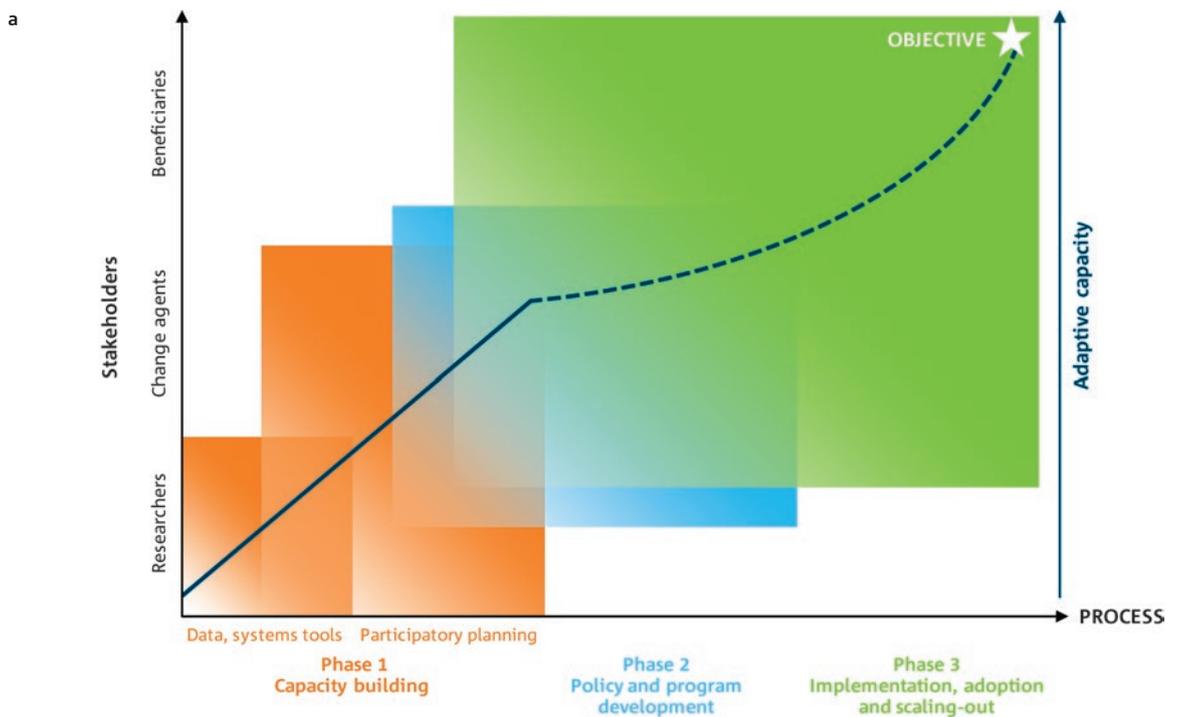


Figure 1. The project’s (a) Impact Pathway and (b) influence on adaptive capacity within the Impact Pathway’s three phases based upon the 18 indicators, colour coded as in part a

# Evaluating impact

To track the influence of the project on stakeholders' adaptive capacity, and to enable comparisons between all Alliance projects, a standardised set of 18 indicators was developed. According to the project's Impact Pathway, each phase encompassed a progressively wider group of stakeholders, and the indicators were designed to assess change amongst them. Fifteen researchers and change agents involved in Phase 1 were interviewed at project completion and asked to provide their assessment of change by scoring each indicator, offering evidence for their scores. Results showed that there had been a positive influence for all indicators in all phases (Fig. 1b).

**PHASE 1: Building capacity** had the highest-scoring indicators, which was to be expected since this was a core focus of the project's activities. The project had a strong emphasis on participatory engagement processes, capability development and the provision of new information for decision making. A key aspect of this project was the creation of new networks and improving knowledge, and the exchange of knowledge for decision making. Stakeholders indicated that they appreciated learning new approaches and the opportunity to consult and integrate information from different sectors, including different levels of government. Skills development was also wide ranging, with respondents indicating that they had even improved their report writing skills as a result of the project.

Overall, the project improved the trust and cooperation between individuals and institutions, with participants appreciating 'two way' communication enabled by the adaptive participatory approach. The lowest scoring indicator was for the project vision and goal. Stakeholders articulated that it was set clearly from the beginning, but by focusing broadly (at the scale of the Delta), there was limited application to more locally specific challenges and options.

## **PHASE 2: Policy and program development**

development management plan indicators scored strongly, however scores for two of the indicators were weaker, most likely an indication that these indices are dependent upon future resourcing decisions. Project stakeholders indicated that they appreciated the process of incorporating results from previous workshops into subsequent workshops, as well as the development of the scenarios maps. Respondents indicated that the results of the project had contributed to the development of climate change adaptation plans for the provinces. In particular it was felt the knowledge was increased by the top-down and bottom-up approaches, and that this knowledge was now being used for training on disaster risk management and raising community awareness in the provinces.

Project results have been included in a new project funded by the Dutch Government, which focuses on the area downstream of the Vam Co River. Can Tho University have indicated that they are using the scenario planning and participatory planning skills developed through the Mekong Futures project to contribute to the strategic planning activities in this project. Further, CTU have also encouraged the World Bank to encourage cooperation between provinces and the construction of local scale infrastructure rather than opting for large scale irrigation projects only.

Project participants indicated that they would like to continue to work with the CTU team to conduct further research and rollout the project at a regional and local level so that it is more community oriented and there can be better articulation of local development needs.

## **PHASE 3: Implementation, adoption and scaling-out**

had a mix of indicator scores, with evidence of strong cross-scale social networks and new partnerships indicators and weaker scores for helping vulnerable beneficiaries and enhancing self-organisation. This could be explained by the scale that the project was targeted at, with researchers and senior government stakeholders rather than focusing on implementable actions for communities and also by the fact that implementation was out of scope for this project.

The project has improved the knowledge, skills, expertise and networks of the researchers and other participant stakeholders. Respondents indicated that they had used this knowledge to inform ongoing activities, such as vulnerability assessments and integrated basin management. For example, provincial stakeholders are now better equipped to cooperate in the management of saline areas.

A number of stakeholders suggested that it would greatly enhance the capacity of local communities if the new information generated by the project was incorporated into implementation plans as it would contribute to self-organisation in vulnerable communities. Interestingly, local agents indicated that they will be using the options generated by the scenarios to inform future planning in the local provinces, which might go some way to improving local community capacity also.

# Key project findings

*Adapted from the 2015 paper in Nature Climate Change 'Responding to rising sea-levels in Vietnam's Mekong Delta'.*

Full paper (open access) can be found here - [http://www.nature.com/nclimate/journal/v5/n2/full/nclimate2469.html?WT.ec\\_id=NCLIMATE-201502](http://www.nature.com/nclimate/journal/v5/n2/full/nclimate2469.html?WT.ec_id=NCLIMATE-201502)

Given the inherent variability of Vietnam's climate, a mixture of hard and soft policies is likely to provide the most effective results for people's livelihoods in Vietnam's Mekong Delta.

Based on the IPCC 4 assessments, a sea-level rise of 30 cm by 2050 is predicted for the coast of southern Vietnam. Rising sea-levels are likely to infiltrate ground water aquifers and increase salinity gradients in large parts of the Delta, in particular during the dry season months of October through May. Approximately 1.8 million ha of Delta land is subject to increased dry season salinity of which approximately 1.3 million ha is affected by saline water above 5 g/l. Increased Mekong River flows during the Monsoon partially reverse salinity dynamics, seasonally reducing upstream salinity concentrations. Increased dry season flows from upstream hydropower dam releases could limit salinity intrusion in the Mekong Delta during the dry season, but reduced flows may limit salt-flushing during the wet season. Generally concessions to construct and operate dams are negotiated independently, and are not subject to a coordinated whole of basin operational strategy.

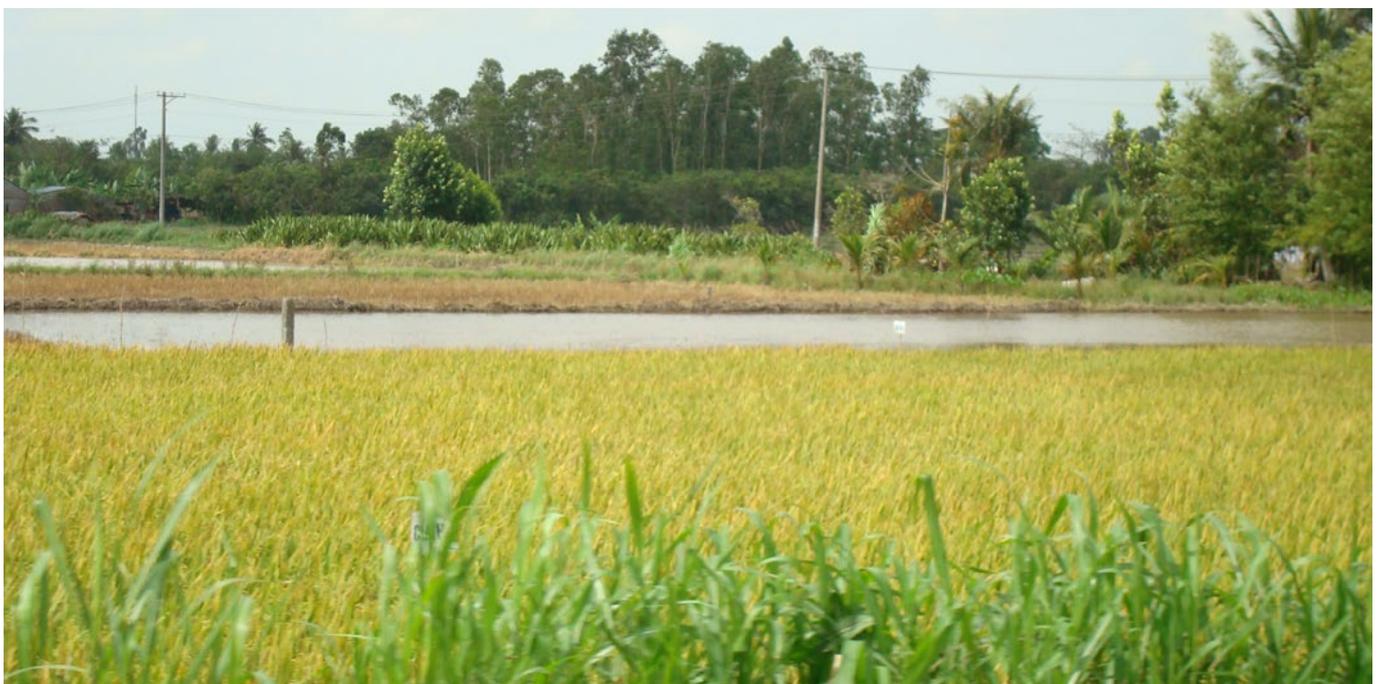
Vietnamese rice exports have become increasingly relevant for global food security with a share in the global rice trade of 19.3% in 2011. However, increasing salinity levels in the Mekong Delta have substantially reduced agricultural

productivity and have caused declining rice production, in particular for low salt tolerant crops and varieties.

The Government of Vietnam has the option of investing in large-scale sea-dikes and sluice gates to manage salinity levels, referred to as hard policy options. Alternatively, agricultural production strategies and land use could be adjusted by introducing salinity tolerant rice varieties and crops, referred to as soft policy options. These are not novel options as salinity intrusion has been a recurring and enduring problem.

The most effective adaptation strategy is a mixture of both hard and soft policies. A combined approach is likely to improve livelihoods and mitigate risks better than implementing only the soft or the hard option. Realizing the potential of soft options requires coordinated agricultural extension efforts to address identified adaptation impediments. Selected investments in sea-dikes along the eastern coastline would further reduce the risk of increasing drought frequency and duration. Sea-dikes in the western parts of the Delta are likely to reduce the income of thousands of households that have already adapted to increasing salinity levels by cultivating shrimp. Our strategy favours soft options for the western areas of the Delta and hard options for the eastern coastline.

Vietnamese government imperatives of sovereign food security, and subsequent decrees dictating rice production, should be re-evaluated to address prevailing institutional barriers that perpetuate the cultivation of rice as communities' primary and obligatory livelihood pursuit. Greater long-term benefits are likely to be realised if households are able to adjust land use to changing environmental conditions.



# Alliance wide lessons

Designing investments to assist vulnerable communities in developing countries adapt to global change (e.g. globalised markets, population growth and climate) is typically complex. This is particularly true for the Alliance where our portfolio of multi-year projects focused on global development challenges related to climate, water resources, sustainable cities, and food security. Each of the projects involved multiple actors (e.g. planning, emergency services, and primary industries) at multiple scales (local, provincial, national and global) and over time, reflecting the broad domain of R4D.

Our experience is that the context-specific nature of these investments is best served by a well-informed approach to project structure and design. Practical learning from these projects can support the development of guidance to improve aid investment outcomes. Key findings included:

- **Strong partnerships and collaboration lead to better outcomes:** Partnerships can be developed or evolve in a number of ways, all of which can be effective. Our projects included partnerships where we led, where we worked with our in-country partners to build demand, and those where we responded to demand. These partnerships were formed and evolved around relationships and purpose. A general observation is that ‘pull’ type projects appear to have the most clearly articulated impact pathway at the national policy level and provide the least scope for expansion; whereas co-developed or evolutionary type projects provide greater flexibility and also more opportunities to broaden partnerships over the life of projects, which can significantly improve impact. In all cases, it takes time to build appropriate, effective communication processes and trust; especially when there are cultural and institutional differences. This can be expedited through ongoing in-country presence and two-way exchanges of personnel, which provides high strategic value but carries a high operational cost.
- **Capacity building and engagement:** Engagement early on (i.e. pre-project) provides a valuable platform for co-development of projects that are then shaped by and can be responsive to local context. This has the added value of building trust between partners, which can be increased over time through capacity building initiatives. Traditional develop-deliver skillsets such as two-way mentoring, use of trusted advisors and local champions to facilitate engagement, improved project management and engagement skills, remain important; however, our experience is that conjointly developed knowledge, products and services are more context-specific and tractable.
- **Participatory approaches:** Partner institutions have high levels of connectedness with government institutions and other boundary partners – giving the research a stronger pathway to impact and increasing its relevance. Participatory approaches can improve the status of research partners and encourage buy-in from key decision-makers, which is important for longer-term support. Participatory planning approaches also strengthen formal and informal networks amongst decision-maker communities and between decision-makers and researchers, building capacity of all participants.
- **Creation of and access to data:** Datasets that are well-structured and accessible will have ongoing value. Where mandates or jurisdictions are unclear and there is a limited history of data curation and sharing, a trusted relationship between parties needs to be developed in order to overcome such procedural and institutional challenges. A trusted third party can play an important role in these situations.
- **Scenario planning:** Scenario planning provides a structured and powerful tool to think about the future and challenges, especially where there are large uncertainties such as changes to natural systems (e.g. water and climate), changes in rules or an adjustment of goals (e.g. livelihood goals); and can be based on existing data, modelled, or a combination of both. Scenarios work best when elicited from in-country partners or developed in conjunction with in-country partners rather than imposed.
- **Systems thinking and approaches:** Systems approaches to better integrate biophysical with social and economic information are highly valued by project partners, from design through all stages of the project lifecycle to decision making. Systems approaches also promote participation from a broader range of stakeholders. In general most local research teams had limited experience of these approaches, including scenario planning, and Alliance activities significantly enhanced their capacity to understand and apply such systems tools.
- **Evaluation methods:** Assessments often take place in complex policy settings and systems where there are multiple actors. Accurately defining, measuring and attributing impacts is vital to describing and communicating the success of investments. The use of mixed methods approaches, and better understanding of which approaches work best under certain conditions, will improve the quality of impact evaluation studies and the articulation of impact. Also, the timely return of results to project research teams and partners is important to maintain the salience of results.

# Steps required to maintain the Impact Pathway

The results presented from this research are only the first step in developing a greater understanding of the challenges facing decision makers in the Mekong Delta, Vietnam. Further capacity building and research will add significant value to networking and coordination efforts across the region. Specific activities could include:

- Run the participatory learning process (CHARL) at provincial and local levels to complement the Delta wide process. This would capture diversity and drive coordination across the provinces; and would also strengthen local decision support capacity in scenario planning for Can Tho University staff and other proponents of the process.
- Develop demonstration projects tied to local development plans and linked with other local agencies, which would provide a pathway to implementation in real situations to influence local plans and development.
- Run a CHARL process with development banks and other key donors to facilitate synergies and cross learning, which would provide a useful sounding board to support strategic investment for a region that is home to a congested donor funding sphere.



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## DFAT-CSIRO RESEARCH FOR DEVELOPMENT ALLIANCE

This project was funded by the Research for Development Alliance, a strategic partnership tackling complex development challenges in the Asia Pacific region.

## FOR FURTHER INFORMATION

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