

## Agriculture, nutrition and women

- 4.1 The Sub-Committee's previous inquiry into the role of the private sector in promoting economic growth and reducing poverty in the Indo-Pacific region highlighted the part played by multi-sectoral partnerships, including the private sector, to deliver these development goals. The current inquiry called for an exploration of the role of partnerships in the agriculture and fisheries sector to address similar goals.
- 4.2 Given the terms of reference for this inquiry are intended to focus on a wider range of issues, including food security, gender equality and women's empowerment, much of the evidence received by the Sub-Committee has highlighted the strong linkages between agriculture, women and nutrition.
- 4.3 As the discussion in the preceding chapter indicates, the causes of malnutrition in the immediate region are, as the Department of Foreign Affairs and Trade (DFAT) submission points out, 'multi-faceted and not just related to insufficient or excessive intake of food'.<sup>1</sup>
- 4.4 Much of the evidence presented to the Sub-Committee highlighted the need for a multi-sectoral approach to address the complex underlying causes of malnutrition. At the same time, as outlined in Chapter two, while agriculture's role in achieving food security has long been recognised, its importance to achieve nutrition goals has only recently been addressed in international development fora. Most notably, Sustainable Development Goal 2 explicitly aims to: 'End hunger, achieve food security and improved nutrition, and promote sustainable agriculture'.<sup>2</sup>

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1 Department of Foreign Affairs and Trade (DFAT), *Submission 12*, p. 34.

2 DFAT, *Submission 12*, p. 35.

- 4.5 Self-evidently, agriculture development can provide a ready source of food and income for poor populations and contribute to broader economic growth. Importantly, too, agriculture development is a major means of empowering women, especially given that women make up at least half of the world's farmers in many countries in the region.
- 4.6 Initiatives that both educate women and enhance their involvement in agriculture-based activities can strengthen women's capacity, increase their access to, and control over, resources and assets, consequently augmenting their power to make decisions on the purchase and allocation of food, health and care within their households.
- 4.7 The purpose of this chapter is to survey some of the programs discussed in evidence to identify how both agriculture and gender interventions, by themselves and in combination, contribute significantly to improved nutrition outcomes. The discussion proceeds in three main sections:
- the first, covers evidence on the role of research and agricultural development partnerships, and how they can support food and nutrition security in the region;
  - the second, discusses the interrelationship between gender empowerment and nutrition through agricultural development; and
  - the third, considers sustainable agriculture and aquaculture, with a specific focus on challenges in the Pacific region.

## **Partnerships for food and nutrition security**

- 4.8 With global food demand expected to increase 60 per cent by 2050,<sup>3</sup> the need to increase the supply of affordable, nutrient rich, healthy safe and fresh food has never been more urgent. Associate Professor Robyn Alders AO, Principal Research Fellow at the Faculty of Veterinary Science, Sydney University, stated:

One of the greatest challenges of our time concerns sustainable agriculture and food and nutrition security. Indeed, a key question that we grapple with and which unifies our work across these fields is how we provide sufficient, nutritious and affordable food for a growing population in an ethical and sustainable manner'.<sup>4</sup>

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3 DFAT, *Submission 12*, p. iii.

4 Associate Professor Robyn Alders, Principal Research Fellow, University of Sydney University, *Proof Committee Hansard*, Sydney 11 March 2016, p. 25.

- 4.9 Much evidence to the inquiry focussed on the role and potential of agricultural development partnerships to meet this challenge in the Indo-Pacific region.<sup>5</sup>
- 4.10 The Sub-Committee was advised that organisations such as the Australian Centre for International Agricultural Research Centre (ACIAR) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) play an important role with DFAT in co-ordinating research and technical innovation to establish and support these partnerships.
- 4.11 ACIAR's submission provided many case studies of projects it has brokered in development of new and improved strains of grains, which are vital as food staples and stock feeds across the region;<sup>6</sup> pest and virus free vegetables;<sup>7</sup> and integrated village management systems for dairy farming and poultry production.<sup>8</sup> Partner organisations also referred to success in these and other areas in their submissions.<sup>9</sup>
- 4.12 The Commonwealth Scientific and Industrial Research Organisation (CSIRO) advised of key contributions in the areas of nutrition sensitive interventions aiding women under the Food Systems Innovation (FSI) initiative,<sup>10</sup> a partnership between CSIRO, ACIAR and DFAT, to improve program designs and interventions, specifically:

5 See a list of Australian Government Partners is in *Appendix E*.

6 For example, Box 5: 'Improved Sorghum For Water-Limited Environments': 'A 5-year project that began in 2014 is boosting the capacity and productivity of the Ethiopian sorghum breeding program, providing germplasm, tools and skills to underpin genetic gain for productivity in water-limited environments' – led by the University of Queensland and supported by the Bill and Melinda Gates Foundation (BMGF, 85 per cent) and ACIAR (15 per cent, or \$600 000)', ACIAR, *Submission 34*, p. 12.

7 Box 7: 'Virus-free Sweet Potato in Papua New Guinea': 'using heat treatment of tissue culture sweet potato plants to eliminate the viruses and generate pathogen-tested (PT) cuttings for replanting' – Australian and international partners, including Queensland's Department of Agriculture and Fisheries and the Australian Sweet Potato Growers Association (ASPGA), and PNG's National Agricultural Research Institute (NARI), ACIAR, *Submission 34*, p. 14.

8 Box 6: 'Innovation in Indonesia (integrated village management system' (IVMS) to improve cow-calf systems in the province of West Nusa Tenggara (NTB) Partners in Indonesia (Mataram University and BPTP NTB) and Australia (CSIRO and University of Queensland), ACIAR, *Submission 34*, p. 13.

9 To name just a few: Nepal Agricultural Research Council (NARC), *Submission 13*; Sub-Institute of Agricultural Engineering and Postharvest Technology (SIAEP), *Submission 24*; Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI), *Submission 25*; Landcare Foundation Philippines, *Submission 40*; Hue University of Agriculture and Forestry, *Submission 44*.

10 DFAT notes that the 'FSI has focused on linking development programs with research and evidence on the role of agriculture in addressing malnutrition, and the role of the private sector in agriculture and poverty reduction', *Submission 12*, p. 10.

- Co-designing TOMAK – To’os Ba Moris Diak – Farming for Prosperity, Timor-Leste’s new agricultural livelihoods program with combined goals of partnering in sustainable and profitable value chains with the promotion of year-round healthy diets.
- Development of Operational Guidance Notes on Nutrition-Sensitive Agriculture and Women’s Economic Empowerment – which will ‘support program managers to integrate gender and nutrition considerations in agricultural interventions’.<sup>11</sup>

4.13 DFAT’s Dr Julie Delforce, Senior Sector Specialist, Agricultural Development and Food Security, spoke on the significance of the new TOMAK program (funded for \$25 million over 2016–2021) as the Department’s flagship for nutrition sensitive agriculture:

[TOMAK] is an innovative program which is trying to bring together both the nutrition and women’s economic empowerment elements of an agricultural program as well as production for market opportunities. One component is about helping farmers to access different new markets which they have not accessed to date. But also incorporated into that is the question, ‘What are the nutrition implications of those new production opportunities?’ A separate component under the one umbrella specifically addresses nutrition issues.<sup>12</sup>

4.14 ACIAR’s Chief Executive Officer Dr Nick Austin referred to successful work under the Timor-Leste Seeds of Life program which supported development of the TOMAK.<sup>13</sup> He considered that the Seeds of Life initiative, which will end in June 2016,<sup>14</sup> had demonstrated how long term research can support innovation, such as by identifying suitable genetic material for scaling up,<sup>15</sup> with measurable benchmarks to drive community level outcomes to specified goals.<sup>16</sup>

11 CSIRO, *Submission 18*, p. 9.

12 Dr Julie Delforce, Senior Sector Specialist, Agricultural Development and Food Security, Agricultural Productivity and Food Security Section, Agriculture and Food Branch, Office of Trade Negotiations, DFAT, *Proof Committee Hansard*, Canberra, 22 February 2016, p. 3.

13 Dr Nick Austin, Chief Executive Officer, ACIAR, *Proof Committee Hansard*, Canberra, 22 February, 2016, p. 11.

14 The Seeds of Life Program began in 2000 and was progressed in three five year phases. See Timor-Leste Ministry of Agriculture and Fisheries (MAF) Seeds of Life – Fini -Ba Moris, ‘MAF-SoL Turnover Ceremony’ 28 January 2016 < [seedsoflifetimor.org/maf-sol-turnover-ceremony/](http://seedsoflifetimor.org/maf-sol-turnover-ceremony/) > viewed 18 April 2016.

15 Dr Austin, ACIAR, *Proof Committee Hansard*, Canberra, 22 February, 2016, p. 13.

16 Dr Peter Horne, General Manager, Country Programs, ACIAR, *Proof Committee Hansard*, Canberra, 22 February, 2016, p. 11.

## The potential of nutrient fortified foods

4.15 As discussed in Chapter three, micronutrient deficiencies are particularly concerning among women and children, with projected impacts for long term population health. Professor Raghendra Jha referred to his research based in India:

When we talk about food sufficiency and nutritional outcomes...we have to think in terms of technological progress of research that helps augment food sufficiency, removes food insecurity and improves nutritional outcomes across a broad spectrum of nutritional indicators – not just calorie but, very importantly, things like micronutrients, which are very essential for the develop[ment] of women and children in particular.<sup>17</sup>

4.16 There was discussion in the evidence of the relative benefits of bio-fortified crops to increase production and nutrient content, for instance:

- World Vision Australia referred to its work with more than five bio-fortified crops in 15 developing countries, including bio-fortified beans – which are 70 per cent higher in iron and 40 per cent higher in zinc compared to normal beans.<sup>18</sup>
- CropLife Australia reported on its Golden rice product, which has elevated levels of vitamin A, and advocated for the use of genetic modification to address food and nutrition shortages, noting: ‘The nutritional quality of staple foods can be substantially improved using transgenic methods compared to what can be accomplished using traditional breeding’.<sup>19</sup>

4.17 The Sub-Committee also heard that nutritious indigenous plants are being researched and improved for larger scale production, including for food supplementation of less healthy mass-produced food products.

4.18 Biosciences Eastern and Central Africa-International Livestock Research Institute (BeCA-ILRI) Hub, for example, referred to research, development and processing of traditional nutrition rich Amaranth plant<sup>20</sup> products:

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17 Professor Raghendra Jha, Professor of Economics, Australian National University, Private capacity, *Proof Committee Hansard*, Canberra, 4 February 2016, p. 5.

18 World Vision Australia, *Submission 22*, p. 4.

19 CropLife Australia, *Submission 37*, p. 9.

20 Amaranth is eaten as leaf vegetable and cereal. It is gluten free with high levels of protein, iron, magnesium and dietary fibre, with bioactive peptides thought to be cancer-preventive.

The Amaranth Project identified and addressed gaps in knowledge and technologies across the amaranth value chain in Kenya and Tanzania, such as the need for more appropriate varieties. It tested, selected and distributed six optimal varieties along with advice on better cultivation techniques and the nutritional value of the crop. The project also worked with the private sector to develop better food processing and new amaranth-based products and to assess the feasibility of consumer uptake.<sup>21</sup>

- 4.19 Dr Martin Golman, a researcher in forestry at Papua New Guinea Forest Research Institute, however, advised that the sale price of improved products can be an inhibitor to commercialisation, citing efforts to promote an ACIAR improved ngali nut product:

.... It needs to be brought out to the farmers and to the rural communities to then take it on and see that the product that they have improved on gets to the market at a reasonable rate so that people can afford to pay for those kinds of foods that are improved in research. I think that is the dilemma we are facing in terms of not getting that far ahead in PNG. I think that is something I am also looking at in terms of forestry to also expand on.<sup>22</sup>

## Diet diversification and 'scaling up'

- 4.20 Many of the projects listed in the first section of this chapter are livestock and diet diversification projects designed to improve nutrition at the local level. Others have potential for scaling up, with implications for the sustainability of local fresh and nutritious food production, as well raising issues about the capabilities to store and supply fresh safe foods.
- 4.21 Poultry is an important source of animal protein and income in rural communities across the region.<sup>23</sup> Sydney University referred to its work under ACIAR funded poultry programs in Timor-Leste:<sup>24</sup>

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See Grains and Legumes Nutrition Council <[www.glnc.org.au/grains/types-of-grains/amaranth/](http://www.glnc.org.au/grains/types-of-grains/amaranth/)> viewed 18 April 2016; DFAT, *Submission 12*, p. 44.

21 Biosciences Eastern and Central Africa-International Livestock Research Institute (the BecA-ILRI Hub), *Submission 11*, p. 1.

22 Dr Martin Golman, Acting Director, Papua New Guinea Forest Research Institute, *Proof Committee Hansard*, Canberra, 15 March 2016, p. 9.

23 DFAT, *Submission 12*, p. 37.

24 Including under the multi-agency Timor-Leste Village Poultry Health and Biosecurity partnership with DFAT, Timor-Leste MAF and Australia's Department of Agriculture and

Since November 2014 alone, our multidisciplinary, multiagency, gender and nutrition-sensitive approach to improving the health of village poultry in Timor-Leste has increased the number of households raising poultry by 13 per cent in communities vaccinating against Newcastle Disease (ND). The emphasis is now on increasing the consumption of animal source food by mothers and children, and on the decision-making power of women.<sup>25</sup>

- 4.22 ACIAR reported on the efficacy of this multi-sectoral approach, referring to a program in Africa to delineate the features of the One Health model, which combines a focus on animal and human health,<sup>26</sup> as shown in **Case study 4.1**, overleaf.
- 4.23 The Committee also heard of other diet diversification programs using pigs, aquaculture and cavy (guinea pigs) for protein and income supplementation in Africa, which also had the benefit of dramatically increasing income.
- 4.24 The Hon. Dr Luc Mulimbalimba-Masururu advised of alternative crop planting in the Democratic Republic of the Congo which had diversified food sources to include aquaculture and pigs, dramatically increasing both protein intake and income. More nutritious crops such as beans, Chinese cabbages and sweet potato were also being grown to supplement less nutrient rich traditional foods such as Ugali, made of corn and cassava flour.<sup>27</sup>
- 4.25 The BecA-ILRI Hub described the results of its 'alternative livestock for smallholder farmer resilience' programs which had created domestic opportunities to breed cavy for 'improved family nutrition and income generation targeting the most vulnerable section of the population: women and children', and were then scaled up across Africa:

... [it is] now estimated that 12 000 individuals are benefiting from the project directly at the household level across the two countries. Intensification of cavy culture is anticipated to improve the livelihoods of more than 200 000 households in North and South Kivu provinces of DRC with the pilot sites set up in collaboration

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Water, DAWR, in DFAT, *Submission 12*, p. 37.

25 Sydney University, *Submission 46*, p. 7.

26 Ms Jo Evans, Deputy Secretary, *Proof Committee Hansard*, Canberra, 29 February 2016, p. 3; and see *Exhibit 15*: R Alders, A Agnololo, B Bagnol, 'Using a One Health Approach to Promote Food and Nutrition Security in Tanzania and Zambia', *GRF Davos Planet@Risk*, Vol. 2, No. 3, *Special Issue on One Health (Part I/II)*, April, 2014.

27 The Hon. Dr Luc Mulimbalimba-Masururu, Mission in Health Care and Development, *Proof Committee Hansard*, Canberra 3 March 2016, pp. 1-3.

with local partners serving as a prime source of training and information on a range of cavy production.<sup>28</sup>

#### Case study 4.1 One Health partnership model—poultry in Tanzania and Zambia

##### **Strengthening food and nutrition security in Tanzania and Zambia**

This ACIAR project purposes to improve maternal and child health and nutrition by improving family poultry and crop production, working with women smallholder farmers.

The five-year project will work to increase the quantity, quality, accessibility and utilisation of nutrient-rich foods (e.g. traditional vegetables, eggs) that are available to households; to demonstrate the benefits of a multidisciplinary approach; and to provide cost-benefit analysis that will underpin decision-making at the policy level in Zambia and Tanzania (and possibly beyond) to support agricultural interventions as a means to improve food security and prevent undernutrition. Women are a primary focus for the project, because of their critical role in both farming and family nutrition.

The project team includes members of the local district and national government ministries of agriculture and health, research institutions and universities all working together. Researchers in the team come from a wide range of disciplines and include nurses, doctors, nutritionists, veterinary virologists, veterinary epidemiologists, economists, ecologists, agronomists, sociologists and an anthropologist. The project has already seen the benefits of this interdisciplinary 'one health' approach—all understand each others' skills and roles understand the project's objectives, and share a common goal.

*Source* ACIAR, *Box 10: Submission 107, p. 20.*

4.26 There were also opportunities to diversify local food production under larger scale agriculture developments. Cocoa production was a notable example.<sup>29</sup> Sydney University's Professor of Plant Pathology David Guest emphasised the utility of the approach to build sustainable food supplies and stable local economies in fragile Bougainville, Papua New Guinea (PNG):

We have just started a new project in Bougainville. Bougainville is a very special case because of the civil war and the impending plebiscite for whether they want to become independent. They

28 BecA-ILRI Hub, *Submission 11, p. 5.*

29 ACIAR, *Submission 34, p. 20.*



really need to get a tax base so that they can become sustainable. The obvious way to do that is through cocoa farming. We want to train people in the villages to think about how you do not just have to grow cocoa. You can diversify. You can be really good cocoa farmers on a small area of land and on the other parts of your land think about other crops: food crops, vegetables, livestock and things like that.<sup>30</sup>

- 4.27 Assoc. Professor Alders referred to the importance of ‘strong collaborations with local government, NGOs and industry stakeholders, including Mars Corporation and other cocoa buyers’ to the successful outcomes for cocoa farmers in Indonesia and PNG:

The benefits of this work have been considerable. Smallholder cocoa farmers have benefited from higher production and income diversification by intensifying cocoa production and freeing surplus land for other food, livestock and cash crops, developing new enterprises that are often more women friendly and resulting in more diversified and resilient farm incomes.<sup>31</sup>

- 4.28 ACIAR’s submission identified potential to achieve similar benefits by scaling up production in cocoa in the Solomon Islands and Vanuatu:

Cocoa is also the third-most-important agricultural export from Solomon Islands and a major export from Vanuatu – in both countries supporting 20–25 per cent of all households. The cocoa industry in Samoa and Fiji is much smaller but scoping studies by ACIAR suggest that both have growth potential, especially to supply low-volume, high-value markets.<sup>32</sup>

## Safe food storage and supply

- 4.29 Once sufficient produce is ready for marketing, post-harvest considerations, such as food storage and transport, can affect the affordability, quality and freshness of the produce.
- 4.30 The Copenhagen Consensus Center discussed the implications of food wastage in the developing world,<sup>33</sup> citing research which found lack of infrastructure to be the main cause of food wastage:

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30 Professor David Guest, Professor of Plant Pathology, University of Sydney, *Proof Committee Hansard*, Sydney, 11 March 2016, p. 28.

31 Assoc. Professor Alders, Sydney University, *Proof Committee Hansard*, 11 March 2016, p. 25.

32 ACIAR, *Submission 34*, p. 20.

33 Copenhagen Consensus Center, *Submission 4*, p. 1.

Simply put, if there are no proper roads, farmers cannot easily sell their surplus produce, which may then spoil before it can be eaten. The researchers found that four key factors could make a real difference to losses in the food chain: an electricity supply, paved roads, rail capacity and road capacity. These mean that farm produce can be sent to market and other food supplies brought in, and that grains can be dried or vegetables kept cool. The ongoing impact of reduced food loss and better infrastructure would be in reduced food costs for the poor, and corresponding decreases in hunger and malnutrition.<sup>34</sup>

- 4.31 DFAT's Ms Chakriya Bowman, Director, Pacific Economic Growth Section, commented further on storage issues in relation to food choices:

Part of it is also a story about urbanisation and storage. It is very hard to store taro when you are in a city area. You actually need quite a large amount of storage space to properly store taro. And transporting taro into those urban areas damages a lot of it. It is hard to do, particularly with the poor state of roads and so on. So, in the urban areas, we see a switch out of those types of products because of the storage issues and because of the easy availability of the other products.<sup>35</sup>

- 4.32 Dr Nyo Htwe, a rice and rodent ecologist with the International Rice Research Institute (IRRI) in Myanmar, referred to the use of pesticides to control rats during storage and transport, which affected food safety. She drew attention to the advantages of collaborative research through IRRI and ACIAR, which had enabled plant and rodent scientists to develop a rodent management system to address this problem, potentially 'throughout Asia, not only in Myanmar – in Indonesia, Vietnam and other places'.<sup>36</sup>
- 4.33 Dr Nurul Hilmiati, Researcher, Indonesian Agency for Agricultural Research and Development, reported on another innovative approach to address urban food supply problems – 'smart gardening' – using verticulture. By growing plants vertically, urban gardens can improve supply of fresh affordable vegetables such as tomatoes and chillies:

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34 Copenhagen Consensus Center, *Submission 4*, Attachment 1: 'Food Security Build Roads in the Developing World to Bolster Food Supplies', International Food Policy Research Institute, p. 50.

35 Ms Chakriya Bowman, Director, Pacific Economic Growth Section, Pacific Regional Branch, Pacific Division, DFAT, *Proof Committee Hansard*, 22 February, 2016, p. 2.

36 Dr Nyo Me Htwe, Postdoctoral Fellow, International Rice Research Institute (IRRI), *Proof Committee Hansard*, Canberra 15 March 2016, pp. 2-3.

The market pressure is very high in Indonesia as well. Even like the small supermarkets...but what the government is now doing is trying to encourage people to use whatever land they have, even in the urban population. They are encouraging people to do gardening in whatever space they have.<sup>37</sup>

## Gender and nutrition

4.34 The Sub-Committee's previous report on the role of the private sector in reducing poverty and the Human Rights report *Empowering Women and Girls* both discussed women's contribution as agricultural workers in the Indo-Pacific region, and the many factors in their disempowerment, including poor financial literacy and access to finance, limited land access or ownership, and the impacts of outmigration leading to the 'feminisation of agriculture'.<sup>38</sup>

4.35 Since these reports were presented, the 2016 *Gender Equality and Women's Empowerments Strategy* has enshrined women's empowerment as a plank in Australia's agricultural development policy, noting:

Women comprise nearly half of the world's agricultural workers but have less access than men to productive resources and opportunities. Improving women's access could increase women's agricultural yields by 25 to 30 per cent and increase agricultural output in developing countries between 2.5 and four per cent.<sup>39</sup>

4.36 DFAT's submission highlighted its intention to research the interrelationship between women's empowerment and better nutrition, in recognition of women's growing importance as primary producers in the developing world.<sup>40</sup> The CSIRO also referred to prior research work with DFAT which confirmed this need, noting:

Encouraging a shift to more nutritionally sensitive agriculture and food systems will both progress women's empowerment and gender equity as well as progressing nutritional quality and

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37 Dr Nurul Hilmiati, Researcher, Indonesian Agency for Agricultural Research and Development, *Proof Committee Hansard*, Canberra, 15 March 2016, p. 9.

38 See in particular Chapter 8, 'The Economic Empowerment of Women', *Empowering Women and Girls*, December 2015.

39 Food and Agriculture Organisation (FAO), *The State of Food and Agriculture, Women in Agriculture: Closing the Gap on Development*, 2010-11, p. 42, cited in *Gender Equity and Women's Empowerment Strategy*, February 2016, p. 9.

40 DFAT, *Submission 12*, p. 41.

security...initiatives that enhance women's involvement in agriculture-based activities can strengthen women's capacity, increase their access to, and control over resources and assets, and consequently augment their power to make decisions on the purchase and allocation of food, health and care within their households, as well as decisions on how to engage in value chains to increase production and value adding processes to generate additional incomes.<sup>41</sup>

- 4.37 The Crawford Fund nevertheless advised that the implications for improving nutrition go well beyond the dimensions of agriculture production to matters of health, training and transformation of social attitudes to women and girls:

In spite of being central to food production, women (who make up 43 percent of farm labour and head many rural households) are not valued in some societies, underrepresented in power structures, more vulnerable to change, poorly educated and unable to control fertility rates. Agricultural research, training of women and girls in improved nutrition (from higher quality foodstuffs) and reproductive health provide part of the solution to these poor outcomes. But men too must be encouraged to recognise the vital contribution that women make. Greater inclusion of women in agricultural decision making and in steps of the supply chain will have significant nutritional, health and associated benefits in many developing countries.<sup>42</sup>

## Empowering rural women for better nutrition

- 4.38 As noted above, the factors affecting women's empowerment as food producers are complex, going beyond the scope of the following discussion; the focus instead is on empowering women who are now in charge of agricultural production in many regional communities.
- 4.39 The implications of the phenomenon known as the 'feminisation of agriculture' were examined in some detail in previous Joint Standing Committee reports. The Human Rights Sub-Committee report *Empowering Women and Girls*, in particular, considered the wider socio-economic impacts of labour flows of both men and women from rural areas with the object of escaping poverty or improving their family's quality of life.<sup>43</sup>

41 CSIRO, *Submission 18*, p. 9.

42 The Crawford Fund, *Submission 49*, pp. 2-3.

43 See particularly discussion, *Empowering Women and Girls*, December 2015, pp. 271-75.

- 4.40 In her submission to this inquiry, Dr Kuntala Lahiri-Dutt discussed the significance of these trends in terms of nutrition intake across the region. In particular, she noted that the influx of remittance income was a double edged sword for rural women: without knowledge of nutrition outside traditional staples and less knowledge of farm management, these women were doubly burdened and disempowered both as carers and farm managers.<sup>44</sup>
- 4.41 Given the challenges imposed, ACIAR emphasised that designing 'gender-sensitive' agriculture projects is particularly important for food security. As a best practice model, the submission referred to the Sustainable and Resilient Farming Systems Intensification' (SRFSI) program in the Eastern Gangetic Plains (EGP) of Bangladesh, India and Nepal, at **Case Study 4.2**, overleaf, which has experienced an exodus of men so that 50 per cent of farms are now under female management.<sup>45</sup>
- 4.42 The CSIRO advised of its contribution in partnership with ACIAR and DFAT to respond to the cultural determinants affecting nutrition for women and children. Dr Daniel Walker, Research Director, Agriculture, referred to work done in the context of the FSI program in the Mekong region in China, where 'smallholder production...is increasingly dominated by female farmers', and noting: 'That raises a range of institutional, cultural and value chain issues in terms of how you most effectively support that emerging smallholder farmer group'.<sup>46</sup>
- 4.43 Dr Andrew Hall, Research Group Leader, Agriculture, added that DFAT and the CSIRO are now working closely to build capacity across their program teams to better understand how 'gender dimensions could be incorporated into program design', aligned with global best practice.<sup>47</sup>

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44 Dr Kuntala Lahiri-Dutt, *Submission 35*, pp. 1–2, and see discussion World Vision Australia, *Submission 22*, p. 7.

45 ACIAR, Box 9: *Submission 107*, p. 15

46 Dr Daniel Walker, Research Director, Agriculture, CSIRO, *Committee Hansard*, 29 February 2016, p. 7.

47 Dr Andrew Hall, Research Group Leader, Agriculture, CSIRO, *Committee Hansard*, 29 February 2016, p. 7.

#### Case study 4.2 Gender strategy for sustainable and resilient farming in the Gangetic Plains

##### **Sustainable and Resilient Farming Systems Intensification (SRFSI) program**

The SRFSI is a large four-year project that began in 2014, with more than 20 partner groups and targeting more than 7 000 farmers in the eastern Gangetic Plains (EGP), home to 300 million people, with the world's highest concentration of rural poverty and a strong dependence on agriculture for food security and livelihood. The project aims to increase smallholder crop productivity and resilience, and to link farmers to markets and support services to enable them to innovate in the face of climate and economic change.

With more than half the farms in the Gangetic Plain region now run by women, the project focusses on empowering and benefiting women. It also aims to improve gender awareness among project team members and participants, and to ensure that the project addresses both men's and women's needs. Its goals include:

- Better understanding the role, capabilities and experience of women: The project has collected separate data for men and women in each of the 40 field sites on their activities; access to resources, information and technology; coping strategies; decision-making; barriers and challenges; and goals and priorities.
- Participation in focus groups: all focus group discussions included women, and some focus group discussions have been divided into separate female, male and mixed groups in a particular effort to gather women's views.
- Participation in activities: both men and women farmers have been included in on-farm testing, participatory evaluation and dissemination of results. The project has successfully targeted the leaders of women's self-help groups to plan and implement field site activities.
- Gender sensitisation training: participants in the training included Australian and local researchers, local agricultural extension staff, local field technicians, and local non-government organisations.

*Source* ACIAR, Box 9: Submission 107, p. 15.

- 4.44 Evidence suggested that targeting those agricultural and livestock activities which are traditionally regarded as appropriate for women not only has nutrition benefits for their families, but can also be socially transforming.<sup>48</sup> Assoc. Professor Alders elaborated on the dual benefits to nutrition and empowerment of women under village poultry programs:

We know that women who control village poultry and make decisions over how household income from their livestock is allocated tend to spend that increase on nutritious food, health care and education. Reports show that an increase in a woman's income of a mere \$10 achieves the same improvements to children's nutrition and health as an increase in a man's income of \$110. If we can empower women, we will achieve improved nutrition. We will also build economic opportunity and support educational outcomes.<sup>49</sup>

- 4.45 Dr Sifa Chiyoge, Regional Director for Africa in the International Co-operative Alliance (ICA), described how participation in female farming co-operatives involved in producing vitamin rich products from the Marula tree,<sup>50</sup> traditionally managed by women, led to leadership roles up the value chain:

In Namibia we have these particular co-operatives which are women's co-operatives. This is for the simple reason that according to the tradition it was the women who did the harvesting and the processing of marula. Some of them have been up to export ... We have the same in Lesotho and Botswana. In our showcases in Africa, we have Lesotho and Botswana with 50 per cent of their managers and their directors being women in co-operatives and these are the mixed ones. We are doing quite well in terms of women in agriculture and they have moved from being workers to becoming owners of agribusiness and the co-operatives.<sup>51</sup>

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48 Sydney University, *Submission 46*, p. 7; BecA-ILRI Hub, *Submission 11*, p. 2.; Dr Sifa Chiyoge, Regional Director Africa, ICA, *Proof Committee Hansard*, Canberra, 3 March 2016, p. 9; Sydney University, *Submission 46*, p. 7.

49 Assoc. Professor Alders, Sydney University, *Proof Committee Hansard*, Sydney 11 March 2016, p. 25.

50 The fruit of the Marula Tree [*Scelerocarya birrea*] is extremely high in vitamin C content and can be used as a base for juices, jams, jellies, ciders and alcohol drinks as well as in aromatherapy, and for homeopathic medicines and essential oils. See Marula Natural Products < [www.marula.org.za/about.htm](http://www.marula.org.za/about.htm) > viewed 30 March 2016.

51 Dr Chiyoge, ICA, *Proof Committee Hansard*, Canberra, 3 March 2016, p. 9.

4.46 The BecA-ILRI Hub highlighted successes under its Africa Biosciences Challenge Fund (ABCF) projects which focus on ‘improving nutritional quality, availability or safety...for pregnant women, nursing mothers, infants and children aged 5 and under’. The ABCF supports women’s involvement in producing Amaranth plants, referred to above, as well as mushrooms, cavies and pigs which are traditionally regarded as being under the ‘control’ – owned, grown raised or sold – by women. For example:

In the Amaranth Project, women are heavily involved in amaranth growing and selling (50 per cent) and even processing in Kenya...Women were strongly represented (87 per cent) in the participatory selection of preferred amaranth varieties for commercialisation and scale-out, based on field performance, palatability/taste evaluation and consumption of amaranth.<sup>52</sup>

4.47 Women were also being promoted at research development level under the ABCF. The submission advised: ‘involvement of women scientists is especially important given that the majority of those who produce, process, and market Africa’s food are women’.<sup>53</sup>

4.48 The Sub-Committee investigated with ACIAR the profile of women under its research and development projects. Dr Austin advised that while ACIAR did not have a gender quota system, there was a requirement for ‘building capacity’ in gender equity under its programs, and particularly for younger women researchers through provision of formal and informal training opportunities:

Within the project teams we will often go back and specify that we are looking for a more diverse capability across the project partner institutions in the developing countries – and, indeed, in Australia, as well – in those partnerships. There is a role in modelling that as well. In many ways that may be the largest lasting legacy, and the capacity that is built. We very definitely take an active engagement in ensuring that there is gender representation.<sup>54</sup>

4.49 The Ministry of Agriculture and Rural Development of Vietnam indicated this approach was effective, with its Sub-Institute of Agricultural Engineering and Post-Harvest Technology – SIAEP reporting that:

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52 BecA-ILRI Hub, *Submission 11*, p. 2.

53 BecA-ILRI Hub, *Submission 11*, p. 3.

54 Dr Nick Austin, CEO, ACIAR, *Proof Committee Hansard*, 22 February, 2016, p. 11.



...70 per cent of SIAEP researchers participating in its ACIAR project [are] women. In the area of production and business, particularly at producers, growers and enterprise (cashew, fruits, vegetables ...), the percentage of women is about 60 to 80 per cent of the workers in the units of the localities.<sup>55</sup>

## Labour saving technology

4.50 Submissions highlighted the importance of innovation in 'labour saving technologies, practices and services for women and girls' to address evolving food and nutrition challenges in the region.<sup>56</sup>

4.51 Dr Htwe of IRRI observed that the development of 'woman friendly' agricultural equipment in Burma is critical because of the outmigration trend. She advised that these technical developments have also supported women's involvement as decision-makers in farming work:

Usually men can work on the big machine. Now, there is a lightweight transplanter... So it is easier to manipulate, yes. Also, there is what we call a 'transeeder' which was developed by our colleagues in Vietnam. Women just push through and then it seeds automatically. In that way, they can finish five acres, so that means 2.5 hectares for one day. For the women, can you imagine if they have to transplant all that; it is not easy. So that is why we are thinking to get the technology which is friendly for women. Also, we try to include women in our meetings and empower them to speak up. Usually, women just sit behind and agree with the men. But in our project they have really opened up now. That is the way we are working for women in agriculture.<sup>57</sup>

4.52 Members of the ICA panel also spoke of the broader benefits to women of larger scale infrastructure development such as in improved water supply and electrification, which had been promoted by farmers' collectives.<sup>58</sup> United States ICA Board Member Mr Martin Lowery referred to the establishment of electricity networks in Bangladesh and in the Philippines under direction of President Kennedy in 1962. He advised that World Bank studies had since shown:

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55 Sub-Institute of Agricultural Engineering and Postharvest Technology (SIAEP), *Submission 24*, p. 2.

56 DFAT, *Submission 12*, p. 41; World Bank Group, *Submission 20*, p. 7; Hue University of Agriculture and Forestry, Vietnam, *Submission 44*, p. 9.

57 Dr Htwe, IRRI, *Proof Committee Hansard*, Canberra, 15 March 2016, p. 5.

58 Dr Chiyoge, ICA, *Proof Committee Hansard*, Canberra, 3 March 2016, p. 9; Mr Martin Lowery, Board Member ICA, *Proof Committee Hansard*, Canberra, 3 March 2016, pp. 9-10.

...very specific changes in infant mortality, in girls' education, in sanitation, in water quality and in the ability to improve the quality of life of women who carry so much of the burden, as we all know, in rural areas around the world.<sup>59</sup>

4.53 Ms Grace Nicholas of ActionAid Australia suggested:

When looking at innovation and technologies, we would advocate for partnerships that consult with women – for example, the kinds of technologies that support women are ones that reduce the need to travel long distances for firewood and simple things like dam liners, which prevent water seepage. With other kinds of technologies that might be introduced, it is essential to ensure that women cannot just engage with the value chain at the low-power level of producer but also participate in and gain across the value chain.<sup>60</sup>

4.54 Dr Mulimbalimba-Masururu of Mission in Health Care and Development supported this view, referring to the role of local organisations in ensuring interventions target women's needs in the Congo. He noted that the Mission, for example, had chosen to invest in many bicycles, rather than spend on motorised transport, to reduce health impacts on rural women who must carry heavy produce over long distances.<sup>61</sup>

## **Sustainable agriculture and aquaculture in the Pacific**

4.55 During the inquiry, sustainable food and nutrition security in the Pacific region emerged as a major issue of concern. The Pacific Island Forum's Office of the Chief Trade Adviser (OCTA) indicated the extent of the problems to be addressed:

- With the exception of a few FICs which are self-sufficient, the majority are net food importing countries...
- Farmers in many FICs are cut off from markets due to the lack of infrastructure. The growing occurrence of natural disasters poses a threat to agricultural production and food security in the FICs.

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59 Mr Lowery, ICA, *Proof Committee Hansard*, Canberra, 3 March 2016, p. 8.

60 Ms Grace Nicholas, Program Quality Co-ordinator, ActionAid Australia, *Proof Committee Hansard*, Sydney 11 March 2016, p. 5.

61 The Hon Dr Mulimbalimba-Masururu, Mission in Health Care and Development, *Proof Committee Hansard*, Canberra, 3 March 2016, p. 6.

- There is a growing urban population in many FICs with limited access to land resources for food production. This has contributed to the weakening of traditional agriculture and given rise to local food security problems.<sup>62</sup>
- 4.56 DFAT's submission highlighted sustainable fishing as an area for urgent action on nutrition and food security in the Pacific region,<sup>63</sup> advising:
- ...while the populations of many Pacific Island countries and territories are growing, coastal fisheries resources are declining. ... Within 15 years, it has been estimated that an additional 115 000 tonnes of fish will be needed across the region for good nutrition.<sup>64</sup>
- 4.57 The submission reported progress under a number of initiatives in the area including the new *Regional Roadmap for Sustainable Pacific Fisheries*, and the Community-Based Fisheries Management (CBFM), being trialled in Kiribati.<sup>65</sup> ACIAR's research over 2015 into the role of fish as a key source of nutrition across the broader India-Pacific region would support further policy making.<sup>66</sup>
- 4.58 In its submission, the OCTA acknowledged recent DFAT funded initiatives to improve nutrition through community-based aquaculture production in Fiji, Kiribati, Samoa.<sup>67</sup> However, the submission also identified a number of other areas where Australia could assist Forum Island Countries (FICs) to develop a more sustainable agriculture industry. In particular by:
- Assisting FICs to adopt 'less-intensive livestock farming practices that can guarantee sustainability and enable the them to produce quality livestock products' for existing niche markets, the needs of the middle income class and tourism.
      - Supporting more sustainable and productive smallholder agriculture, especially involving women and youth, 'by providing new dynamic markets and employment opportunities as well as access to finance'.
      - Addressing climate change at the pre-harvest stage by 'assessing current and possible crop varieties, as well as crop

62 Office of the Chief Trade Adviser – Pacific Island Forum Countries (OCTA-PIF), *Submission 7*, pp. 4, 6.

63 DFAT also noted that, while the coastal fisheries sector is of vital importance to support rural livelihoods, inshore fisheries provides a secondary income source for 50 per cent of coastal households in the region. DFAT, *Submission 12*, p. 17.

64 DFAT, *Submission 12*, p. 33.

65 DFAT, *Submission 12*, p. 18.

66 DFAT, *Submission 12*, p. 36.

67 OCTA-PIF, *Submission 7*, p. 8.

and livestock production systems to determine their climate resilience, and advanced farm management methods’.

- Developing an ‘understanding of climate change effects on existing commercial crops and pest and disease regimes, as well as considering ‘the benefits of increased access to irrigation and water efficiency technologies’.<sup>68</sup>

4.59 At present, many initiatives for agriculture development in the Pacific region are pursued in the context of trade and biosecurity. The Pacific Horticulture and Agriculture Market Access (PHAMA) program appears to be Australia’s key investment in agriculture development in the Pacific region, with a focus on increasing agricultural exports.<sup>69</sup> As part of this work, ACIAR partners with DFAT and seven Pacific countries to promote ‘an understanding of, and compliance with, biosecurity measures regulating trade in ginger, taro, papaya, breadfruit, mango among other commodities’.<sup>70</sup>

4.60 In its submission, the DAWR described its responsibilities under a number of partnership agreements designed to support ‘expanding exports, sustaining natural resources and managing biosecurity risk’.<sup>71</sup> These include: regulation of illegal fishing and logging;<sup>72</sup> reducing infectious diseases in livestock and poultry;<sup>73</sup> development of agricultural policy to support food security in India;<sup>74</sup> and biosecurity in cargo management.<sup>75</sup>

4.61 DAWR’s Deputy Secretary Ms Jo Evans, however, further advised that improving human health is not regarded as a strategic objective, although this may be incidental to core departmental activities:

Our main focus is on technical and economic partnerships to grow our portfolio related market opportunities and to manage

68 OCTA-PIF, *Submission 7*, p. 7.

69 Funded jointly by the Australian and New Zealand Government, DFAT has committed \$30.8 million over 2010–17, DFAT, *Submission 12*, p. 44.

70 See Box 3. ‘Partnerships for Enhanced Biosecurity for a Full List of Projects’ ACIAR, *Submission 34*, p. 10.

71 Department of Agriculture and Water Resources (DAWR), *Submission 33*, p. 1.

72 Indian Ocean Rim Association Economic Diplomacy Fund Regional fisheries engagement; Illegal Logging: Regional Capacity Building Partnership in the Asia Pacific, DAWR, *Submission 33*, p. 2, and see *Supplementary Submission 33.1*.

73 The Australia Indonesia Partnership for Emerging Infectious Diseases Animal Health Program Phase 2 (AIPEID2); The Timor-Leste Village Poultry Health and Biosecurity (VPHB) Program; Stop Trans boundary Animal Diseases and Zoo noses (STAN DZ); DAWR, *Submission 33*, pp. 3, 4.

74 Australian support for the OECD agricultural policy review of India; Department of Agriculture and Water Resources, *Submission 33*, p. 3.

75 Government Partnerships for Development project, DAWR, *Submission 33*, p. 4.

biosecurity risk...The areas we look for our co-operation activities to address include managing and responding to biosecurity risks. For example, we have a joint animal health surveillance program with Papua New Guinea and Timor-Leste. We also have an extensive program with Indonesia on looking for emerging infectious diseases.<sup>76</sup>

## Committee comment

- 4.62 This chapter has examined evidence submitted to the Sub-Committee's inquiry into the value of development partnerships in agriculture through a different lens. With the world demand for food more than doubling by 2050, it has never been more urgent to look closely at the inter-relationship between nutrition, food security and approaches to agricultural development.
- 4.63 Submissions to the inquiry, in addressing the terms of reference, have covered a wide range of factors which could promote or impair efforts to achieve food and nutrition security across the Indo-Pacific region. The evidence also demonstrated that there are many innovative approaches to agricultural development which have improved the local supply of nutritious foods, with opportunities to scale up production through engaging with the private sector.
- 4.64 Many of the projects described in evidence, but by no means all, have focused on women. The 'feminisation of agriculture' across the Indo-Pacific region has highlighted the need to transform both agriculture production and gender relations if the supply of affordable nutritious food is to be met.
- 4.65 The long history of work in Africa highlights the challenges this entails. Care Australia for example wrote of the plight of 'rural marginalised women, working on smallholder farming, raising cattle, or raising income through fishing or mining', noting:

These women are overloaded with productive and reproductive responsibilities, but have little access to the resources they produce. They own no farmland; in the pastoralist/agro-pastoralist communities they own no cattle or grazing land; and in the fishing communities they own no fishing gear.<sup>77</sup>

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76 Ms Evans, DAWR, *Proof Committee Hansard, Canberra* 29 February 2016, p. 1.

77 Care Australia, *Submission 10*, p. 2.

- 4.66 The detailed examination in the previous chapter of the dietary trends and their already alarming impacts in the Pacific region, and those emerging in South Asia, anticipates a new and necessary shift in focus to the immediate region under Australia's agricultural development programs.
- 4.67 At present many agricultural programs targeting Pacific Island nations are undeveloped. Successful multi-sectoral initiatives in poultry development in Papua New Guinea and Timor-Leste could profitably be extended across the Pacific region.
- 4.68 Work being done by ACIAR to promote the nascent cocoa industry in Samoa and Vanuatu also demonstrates the potential of cocoa production for niche market development.<sup>78</sup> The new SeedPacific initiative, being advanced under DFAT's innovationXchange,<sup>79</sup> also provides an opportunity to pilot multi-sector nutrition sensitive agriculture approaches in the region. The use of technology to improve health<sup>80</sup> should be partnered with agriculture and aquaculture innovation, in particular to improve outcomes for women under the TOMAK model pioneered in Timor-Leste.
- 4.69 Given the focus on biosecurity and key food security challenges in South East Asia and the Pacific region, there would appear to be a need to better co-ordinate Agriculture portfolio activities that have potential impacts on nutrition as well as food productivity and biosecurity. The Sub-Committee considers that the One Health model, as illustrated in **Case study 4.1**, provides a template to promote multi-sectoral partnerships to address malnutrition challenges in the region.
- 4.70 The Australian Government's focus on sustainable fishing in the Pacific region is a welcome development, being vital to both nutrition and regional food security. As discussed in Chapter three, the Pacific has rich culinary traditions which provide opportunities to enjoy tasty, inexpensive and nutritious foods. In its submission, DFAT has referred to a range of Pacific-based initiatives on fishery management, and has also reported on the new investment in the Indian Blue Economy Aquaculture Challenge agreement to deliver both nutrition and socio-economic benefits to the poor in Indian Ocean Rim nations.<sup>81</sup>

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78 ACIAR, *Submission 34*, p. 20.

79 DFAT, *Submission 12*, Case Study Box, p. 40.

80 DFAT, Correspondence to the Sub-Committee Chair, 27 October 2015.

81 A three-million dollar aid investment, the Blue Economy Aquaculture Challenge was agreed during the Indian Ocean Rim Association (IORA) Council of Ministers Meeting in Padang, Indonesia on 23 October 2015. DFAT advises that the 'Challenge is the culmination of extensive work by DFAT's innovationXchange, in partnership with CSIRO, to identify areas

- 4.71 The Sub-Committee anticipates that, in the context of the Government's commitments to integrate a nutrition focus into aquaculture management across the Pacific region, an agreement similar to the Blue Economy Aquaculture Challenge could be made with partner organisations in the Pacific region. This will be important in the context of balancing the many challenges involved in sustainable ocean management, including the growing competition between commercial and subsistence fisheries.<sup>82</sup>
- 4.72 There is a clear nexus between women, agriculture and good nutrition and health. The Sub-Committee was pleased to see advances for women in agriculture are being considered in the context of the Australian Government's commitment to integrate gender and nutrition programs.
- 4.73 Successful work to date by ACIAR and the CSIRO, with research and development partnerships across the range of sectors, demonstrates the potential that empowering women farmers has to improve nutrition and promote sustainable community level development across the region.
- 4.74 The Sub-Committee also commends ACIAR for its role in supporting women to be decision-makers under its agricultural development programs. Its scholarship and fellowship programs are also sensitively providing opportunities for women researchers to advance food and nutrition development programs.
- 4.75 It is now time for the Government to build on this work through dedicated investment in the Pacific region, with promising complementarities under the Pacific Women Shaping Pacific Development<sup>83</sup> initiative to ensure women's voices are being heard, and priorities set, with nutrition and well-being are at the centre of the region's future development agenda.
- 4.76 Recommendations to advance these objectives are made in the final chapter.

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that have potential for transformative change in the "Blue Economy". See DFAT, *Submission 12*, p. 9.

82 See discussion Australian Institute of Marine Sciences, *Submission 53*, pp. 2-3.

83 As noted in previous Sub-Committee reports, the Pacific Women Shaping Pacific Development (Pacific Women) program is a \$320 million over 10 years aid commitment by the Australian Government to improve the political, economic and social opportunities of Pacific women. See Australian Aid, Pacific Women Shaping Pacific Development <[www.pacificwomen.org/](http://www.pacificwomen.org/)> viewed 20 April 2016.

