



ACIAR

IN VIETNAM



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Front cover photo: H'Mong farmer Vang A Sa with his family. Mr Sa established Bo Nhang 2 Cooperative to supply safe vegetables to Big C supermarkets.

Credit: Khanh Long, Vietnam News Agency

Back cover photo: A safe vegetables nursery owned by farmer Vang A Sa, Moc Chau district, Son La province.

Credit: Khanh Long, Vietnam News Agency





Professor Andrew Campbell, ACIAR CEO, delivering remarks at the award ceremony. Credit: Quang Minh

ACIAR received the Friendship Order

On 12 June 2019, Vietnam Government awarded the prestigious Friendship Order to ACIAR. The Order was nominated by the Vietnam Academy of Agricultural Sciences (VAAS) for ACIAR's significant contribution to Vietnam's agricultural sector.

On behalf of the government, Vice Minister Nguyen Hoang Hiep from the Ministry of Agriculture and Rural Development (MARD) presented the Friendship Order to Professor Andrew Campbell, ACIAR CEO. The award ceremony was witnessed by Vietnam's Deputy Prime Minister/cum Foreign Minister - H.E. Pham Binh Minh, Australia's Minister for Foreign Affairs - Senator the Hon Marise Payne, and senior officials from the two governments.

'This award recognises the achievements we have attained through genuine collaboration over many years', said Professor Campbell. 'Vietnam is a very important partner of ACIAR and it is heartening to see it evolves from aid to a long-term technical partnership based on substantial co-investment

in support of Vietnam's sustainable agriculture goals'.

This achievement reaffirms ACIAR's ongoing efforts, investing in agricultural research to support Vietnam's socio-economic development. The Friendship Order is the highest recognition of the Vietnamese Government to individuals and organisations, who significantly contribute to the development and promotion of the friendship, solidarity and cooperation between Vietnam and other countries in the world.

On the same day, ACIAR also held a reception to express our thanks to key partners who had been closely engaged with ACIAR over the last 25 years.

Arrival and departure of the head of mission



*Mr Craig Chittick visiting a tea-processing workshop in Ta Xua district in 2016.
Credit: ACIAR Vietnam*

We farewell

Our former Ambassador Craig Chittick completed his three-year posting on 4 July 2019. We would like to thank him for his strategic direction, which contributed to the establishment and implementation of the Strategic Partnership between Australia and Vietnam. Specifically, over the recent three years, bilateral trade increased by 17% annually on average. Some agricultural products of Vietnam like lychee, mango and dragon-fruit have entered the Australian market, which opens potential opportunities for other farm produce in the future.

Ambassador Chittick was much interested in agriculture projects benefiting local farmers, especially those in remote areas. He had memorable visits to the ACIAR projects, such as to the agroforestry and safe vegetable value chain ones in the Northwest region.

At the end of his term in Vietnam, Ambassador Chittick received the Friendship Order from the President of Vietnam for his great contribution to Australia-Vietnam relations.

We welcome

And we would like to warmly welcome Ms Robyn Mudie, who officially became the new Australian Ambassador to Vietnam on 7 August 2019.

Ms Mudie is a senior career officer with the Department of Foreign Affairs and Trade and was most recently Executive Director, Diplomatic Academy. She has previously worked overseas as High Commissioner to Sri Lanka and Maldives; Deputy Permanent Representative, United Nations (UN), Geneva; First Secretary, UN Permanent Mission, New York; and Second Secretary, Australian Embassy, Ha Noi. In Canberra, Ms Mudie has been as Assistant Secretary, Public Diplomacy Branch; Assistant Secretary, Information Resources Branch; and Director, Strategic Policy Section.

Ms Mudie holds a Master of Southeast Asian Studies from the University of Hull; Bachelor of Arts (Honours), from the University of Adelaide; and a Graduate Diploma (Foreign Affairs and Trade) from the Australian National University.

Ms Mudie is the second Australian female Ambassador to Vietnam. She speaks Vietnamese. Please join us in wishing her a successful term in Vietnam. We look forward to introducing her to ACIAR's projects in the near future!



HE Robyn Mudie presented her Letter of Credentials to Vietnam's President, General Secretary Nguyen Phu Trong on 7 August 2019, formalising her appointment as the Australian Ambassador to Vietnam. Credit: Vietnam News Agency

ACIAR to support coffee and pepper value chains in the Central Highlands



Professor Andrew Campbell meeting with a farmer in the coffee-pepper intercropping farm trial by WASI. Credit: ACIAR Vietnam

ACIAR CEO, Professor Andrew Campbell visited Vietnam's Central Highlands in July 2019 to initiate ACIAR's support to the region.

Vietnam is the number one producer of Robusta coffee in the world with around 650,000 ha of plantations. Coffee plantations are mostly in the Central Highlands and mainly managed by smallholders (who often work on farms of less than two ha each). These small plots are the main source of income for most coffee-farming households.

Vietnam is also the world's number one producer of pepper. Vietnam exported about 230,000 tonnes of pepper in 2018, nearly 8% higher than in 2017. The production is also mainly in Central Highlands. The cultivation area has increased sharply since 2010 to over 150,000 ha in 2017, exceeding the area zoned in the Government's plan by 100,000 ha.

However, the productions of both of coffee and pepper are currently threatened by many issues that are affecting the livelihoods of local farmers. The issues include but not limit to soil degradation and erosion, rapid depletion of groundwater, significant variations in quality, major post-harvest issues, and problematic market chains. The issues severely undermines the commodity prices thus resulting in declining incomes of smallholder producers in the Central Highlands.

ACIAR is strongly committed to deploying the ACIAR Vietnam Research Collaboration Strategy 2017-2027, which identified Central Highland as a new geographic focus area for ACIAR's work in Vietnam. ACIAR is now starting two small research and development activities (SRAs) to identify on-farm and off-farm issues of the coffee and pepper production in the Central Highland. The SRAs will run until June 2020 to pave the way for a new project that looks into solutions of the key identified issues.

ACIAR CEO, Professor Andrew Campbell had a trip to the Central Highland from 28-30 July, 2019 to meet with partners from the Western Highlands Agriculture and Forestry Science Institute (WASI), Tay Nguyen University, Dak Lak Department of Agriculture and Rural and Development, researchers from the International Center for Tropical Agriculture (CIAT), The World Agroforestry Centre (ICRAF) and especially growers from the different farms (both mono-cropping and intercropping models of coffee and pepper) in Dak Lak province.

'ACIAR, together with local partners are working on the whole-of-chain approach to solve that challenge and others including market, technical



ACIAR CEO Professor Andrew Campbell (left) and Mr Howard Hall, Agribusiness Research Program Manager (right) in an intercropping farm in Krong Pak, Dak Lak province, Vietnam July 2019. Credit: ACIAR Vietnam

support and capacity building. Our new project, a joint effort between the two ACIAR’s research programs: Agribusiness (AGB) and Soil and Land Management (SLAM), has a big job to do, but amazing potential to benefit more than a million smallholders in this newly developing region, where ethnic minorities make up a significant proportion of the population’, said Professor Campbell.

About the project:

‘On-farm: Identifying entry points for black pepper and coffee production in the Central Highlands in Vietnam’ (SLAM/2018/209). This will identify priority research, development and collaboration opportunities for sustainable, inclusive and competitive coffee and black pepper farming systems in the three target Central Highland provinces of Gia Lai, Daklak and Daknong. The

project will characterise coffee and black pepper farming systems in these provinces, collecting baseline information and undertaking a situation analysis (on farming system; soil health and production area) to provide clarity on the extent and severity of the problems affecting production.

‘Off-Farm: Strategic review and planning for enhancing the livelihoods of coffee and pepper smallholders in the Central Highlands of Vietnam through improving stakeholders’ participation in agribusiness led value chains’ (AGB-2018-208). The project aims to increase the sustainability, productivity and economic value of coffee, black pepper, (and integrated fruit and food crop) farming systems and value chains in the Central Highlands region of Vietnam. It contributes to the broad goal of increasing socio-economic development in the region.



Visiting a coffee-pepper intercropping farm supported by Nestle. Credit: ACIAR Vietnam



Second Regional Cassava Mosaic Disease meeting in Tay Ninh on 8 May 2019. Credit: Minh Khue

Regional Cassava Mosaic Disease meeting

Tran Nam Anh, ACIAR Vietnam

The Cassava Mosaic Disease (CMD) virus is spreading in the South-East Asia (SEA) region, most notably in Cambodia and Vietnam. The virus has been identified as the Sri-Lankan Cassava Mosaic virus, which is spreading quickly via cuttings and whiteflies. The epidemic is well established at present in 31 provinces in three countries (Cambodia, Thailand and Vietnam) and will likely continue and invade the whole region.

Considering the importance of the cassava crop in the region (>55 million tons/year and >US\$10 billion business), urgent actions are needed to stop the spread and put CMD under control. Therefore, the first Regional Cassava Mosaic Disease meeting was held in September 2018 in Cambodia. This second meeting in Mainland Southeast Asia was held in Tay Ninh from 7 to 9 May 2019.

The event in Tay Ninh was organized by the Global Cassava Partnership for the 21st Century (GCP 21) and The International Center for Tropical Agriculture (CIAT), in collaboration with Vietnam's Plant Protection Research Institute and the Agricultural Genetics Institute. The event attracted more than 50 participants from Cambodia, Laos, Thailand, and Vietnam.

The event aimed to connect stakeholders and actors of the cassava industries in the region to share information and review the development of the CMD control plan for the region. It is agreed that a well-coordinated plan to control or limit the spread of CMD has to be developed urgently before the disease could reach catastrophic proportions. The organizers also encouraged active involvement and commitment of the ministries of agriculture in the four countries.

According to Mr Nguyen Van Hong, Director of Tay Ninh Provincial Sub-department for Plant Protection, the province is Vietnam's largest cassava producer (with some 60,000 ha of cassava plantation, 62 processing factories and the 2018 production was three million tons of raw materials). Tay Ninh is now severely affected by the CMD (which first appeared in the province in 2017). With strong management of Vietnam's Ministry of Agriculture and Rural Development (which has formed a National Steering Committee on CMD control), Tay Ninh is now implementing various CMD control methods, such as using safe & clean cuttings for breeding, large-scale planting and insecticide spraying, implementing whitefly traps and eradication of infected plantation etc.

During the event, a steering committee was organized to coordinate member countries' activities. CIAT representative, Dr Jonathan Newby introduced about the coming ACIAR funded cassava project 'Establishing sustainable solutions to cassava diseases in mainland Southeast Asia' (AGB/2018/172) and raised some issues of GCP21's interest, such as encouraging active communications among countries; calling for champions in the public - private partnership; safe cassava breeding and capacity building plans in the region.

Participants called for more research in the issue, strengthened plant quarantine and enhanced public awareness through media activities in the region. They also spent a day on field, visiting two cassava growing sites in Tay Ninh to see the status and impact of CMD in the province. All agreed that this was a good forum to discuss and raise awareness of emerging CMD control issues as well as to share good lessons learnt, thus enabling quick regional reaction and collaboration.

The 37th meeting of Policy Advisory Council

Nguyen Van Bo, ACIAR Policy Advisory Council Member

The 37th Policy Advisory Council (PAC) meeting was held in Lao PDR from 11-15 March 2019, including three days of field trips to ACIAR projects in Laos. There were seven PAC members from Australia, India, Cambodia, Pacific region, Zimbabwe and Vietnam. The PAC meeting was accompanied by a six-member ACIAR Commission chaired by Mr Don Heatley. Ms Jane Chandler, Australian Deputy Head of the Mission to Lao PDR also attended the meeting.

The PAC meeting focused on how to improve the efficiency of ACIAR projects in both operation and delivery. Dr Nguyen Van Bo, ACIAR PAC member from Vietnam, delivered a presentation on 'How to make ACIAR stronger and more efficient'. The presentation, which was highly received by the participants, emphasized the need to synchronize each country's collaboration strategy with ACIAR's 10-year strategy (approved by Australian Foreign Minister Julie Bishop on 26 February 2018). It also introduced ACIAR Vietnam's 10-year strategy and its commitments to Vietnam. The strategy was endorsed by Vietnam's Ministry of Science and Technology (MOST) and Ministry of Agriculture and Rural Development (MARD). Specifically, Dr Bo recommended that ACIAR should focus more on the following priorities: *i) food and nutrition security; ii) food safety, food loss and food waste; iii) climate change with a focus on GHG emission, drought and salinity intrusion; iv) farmers' income; v) investment from government and enterprises; and vi) environment protection in rural area, both physical and cultural.*

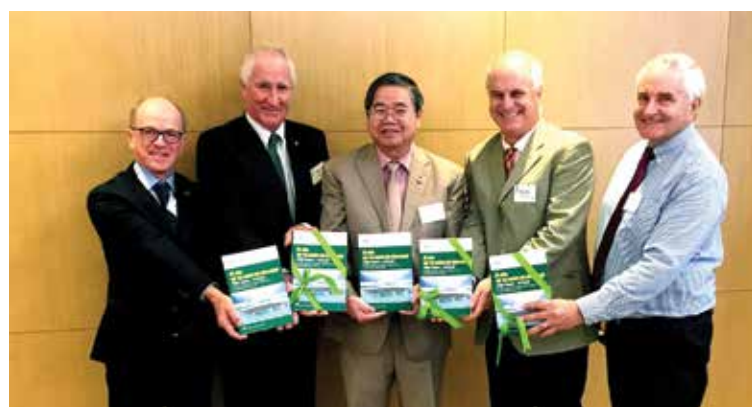
The presentation indicated that food security remained the biggest challenge for ACIAR's partner countries. The Global Food Security Index 2018

showed that, rice exporting countries still suffered from low food security index, for example: India, Thailand, Vietnam and Cambodia ranked 77, 53, 63 and 86 in the world respectively.

In order to ensure food and nutrition security, and climate change adaptation, Vietnam suggested ACIAR to support the partner countries in the followings: *i) application and development of smart agriculture, taking advantages of climate change, market opportunities, available resources, including people's capacity and capable investment; ii) production more from less, enhancing the efficiency of land and water resource use, and limiting toxic chemical usage.* Regarding solutions, the presentation highlighted the necessity of policy research to encourage investment from the private sector in agriculture, and value chain improvement, including the effective utilisation of by-products and production of functional foods.

With a view to increase efficiency of ACIAR projects, Vietnam proposed that ACIAR coordinates with the partners to widely disseminate the project's results through the agricultural extension network. Each project should diversify funding sources and give priorities to market linkages, production management, and capacity building for cooperatives, farmer organisations, and enterprises governance. Encouraging contributions from partner countries in ACIAR projects would demonstrate their commitment and also ensure that the projects are aligned with the priorities of each country.

The 37th PAC meeting was also a great opportunity for Vietnam to introduce the newly- published '25 years ACIAR - Vietnam Collaboration in Agricultural Research' book.



The '25 years ACIAR - Vietnam Collaboration in Agricultural Research' book launching event at PAC 37th Meeting. From left to right: Dr Peter Horne (ACIAR General Manager Countries Program); Mr Don Heatley (Commission Chairman), Dr Nguyen Van Bo (PAC - Vietnam); Professor Andrew Campbell (ACIAR CEO); Professor Kym Anderson (PAC President). Credit: Dr Nguyen Van Bo

Attracting investment in the agricultural sector

Pham Bao Duong, Vietnam National University of Agriculture

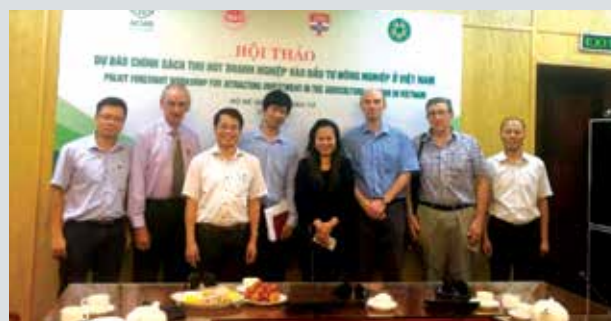
The ACIAR funded project *'Evaluating and improving policies for attracting investment in the agricultural sector in Vietnam'* aims to support the Ministry of Planning and Investment (MPI) to review and update the agricultural policies relating to attract investment in agriculture. The project was implemented from 2018 to 2019 with the total budget of A\$120,000.

The final project activity was a policy foresight workshop, which aimed to present the final report for comments and suggestions. The workshop was held on 17 June 2019 at MPI. More than 20 officers from government agencies and NGO actively joined and provided positive feedbacks on project's findings. In particular, participants discussed on how to evaluate the impacts of the Decree 57 in the medium term, and what would be future directions for policies to support investment and business in agriculture.

It was agreed that delivering training and setting up data baseline were the two priorities. Dr Nguyen Thanh Duong, Director General of MPI's Department of Agricultural Economy stressed the importance of these two issues in helping government officers to set clear objectives and quantifiable targets to evaluate the effectiveness of the Decree 57.

Another project activity was the *'International training workshop on policy analysis'*, organized by Vietnam National Agricultural University (VNUA) on 19 July 2019. Attending the training were more than 70 lecturers and post-graduate representatives of the agriculture and forestry universities (including VNUA, Thai Nguyen University of Agriculture and Forestry, the University of Economics, Thai Nguyen Business Administration, Thai Nguyen University of Information and Communication Technology, Bac Giang Agriculture and Forestry University, Forestry University, Hung Yen University of Finance and Business Administration, Thai Binh Agricultural Intermediate School, Research Institute for Fisheries Economics and Planning, and Institute of Development Economics). The workshop was also attended by representatives from non-governmental organisation World Vision, policy executive units (such as Ha Noi Department of Agriculture and Rural Development, Tho Xuan district, Thanh Hoa province).

Professor Pham Van Cuong, Deputy Director of VNUA strongly emphasized the importance of



Representatives at the Policy Foresight workshop.
Credit: Vu Hoang Yen

capacity building in policy analysis and evaluation. He also highly appreciated the partnership in the project. He thanked ACIAR, University of Sydney and MPI for active collaboration in lectures and study activities.

Participants learned and shared on analysis and evaluation from theory (presentations of Professor Tiho Ancev and Professor Gordon MacAuley, University of Sydney) to various practical methodologies implemented in Vietnam (presentations of Professor Do Kim Chung, Professor Nguyen Phuong Le, VNUA and Dr Tran Toan Thang, National Center for Socio-Economic Forecast Information, MPI). After the presentation session, lecturers and researchers energetically raised comments to the presenters. Questions mostly focused on experiences of how to apply methodologies, tools in policy evaluation, or raising voice to the government agencies and policy-makers.

The training session was very meaningful for learning, teaching and studying in the field of policy planning, implementation and evaluation. The presentations and sharing of experts provided a theoretical basis for evaluating policies and handling interventions when implementing policies. The speakers also wanted to catalyze ideas in scientific research and application in agricultural and rural development through their presentations. Participants wished to have further intensive courses on topics such as policy analysis methods, toolkits and analysis indicators.

ACIAR PROJECT: ADP/2018/120: *'Evaluating and improving policies for attracting investment in the agricultural sector in Vietnam'*

MORE INFORMATION:

Professor Tiho Ancev, University of Sydney, tiho.ancev@sydney.edu.au

Supporting partners to join the 4th World Agroforestry Congress

Nguyen Mai Phuong and Nguyen Quang Tan, ICRAF



Participants of the 4th WAC in Montpellier, France in May 2019. Credit: ICRAF Vietnam

Attending international conferences is always important for researchers and government partners to exchange experiences, share knowledge and enhance networking. In May 2019, thanks to support from ACIAR, a team of five researchers from the World Agroforestry (ICRAF) Vietnam and officials from the Department of Agriculture and Rural Development (DARD) of Son La and Dien Bien provinces, members of the project '*Enhancing market-based agroforestry systems and rehabilitation of degraded forests in Northwest Vietnam*' FST/2016/152, attended the 4th World Agroforestry Congress (WAC).

The largest global agroforestry event took place in Montpellier, France from 20 to 22 May 2019. The main theme was strengthening the links among the science, society and policy. A total of 300 oral presentations and 600 posters from more than 100 countries around the world were presented, reflecting result of research on all aspects of agroforestry.

The ICRAF Vietnam team had two presentations by Do Van Hung (*Economic and environmental benefits of on-farm agroforestry practice in the Northwest Vietnam*) and Nguyen Mai Phuong (*Local knowledge on the role of trees in coffee agroforestry systems of the Northwest Vietnam*). There were also two posters from Vietnam team: one by Dr La Nguyen on outcomes of the AFLI-i and AFLI-ii projects (*Agroforestry for livelihoods of smallholder farmers in North-West Vietnam, phase 1 & 2*) and one by Pham Huu Thuong on

the selection *Docynia indica* (Son tra) superior genotypes and clone trials.

The 4th WAC was also an opportunity for project partners from provincial DARD to learn about multiple benefits from agroforestry. Government officials from DARD found it very useful to join the discussion on the role of agroforestry in the combat against land degradation and desertification as well as on scaling up of agroforestry innovations.

Also on this occasion, ICRAF Vietnam team and local partners joined a Forestry Program Information Exchange meeting hosted by ACIAR. The meeting was participated by 12 ACIAR funded projects of the Forestry Program around the world. It provided a chance for different projects and their partners to share their overall strategy, key results and discussed opportunities and challenges in project implementation.

The 4th WAC concluded with a summary of achievements and the road map for agroforestry development. The joint statement of the congress called for action of all stakeholders including local people, private sector, researchers, practitioners and decision makers at all levels to have a wider view on agroforestry towards future benefits. For ICRAF Vietnam team and local partners, it was an invaluable experience. It was not only the chance to share experience from Vietnam, but also to learn about various aspects of agroforestry and to interact with agroforestry stakeholders around the world.



ACIAR session at the Vietnam International Water Conference. Credit: ACIAR Vietnam

Sustainable groundwater use in the agricultural sector

Richard Bell, Murdoch University

Agricultural development, climate change, rapid urbanisation and population growth have brought water scarcity and declining water quality into focus over the last two decades.

Globally, fresh water, a valuable resource most used and needed for intensive crop production, human and animal consumption, has been declining over years. In Asia, 3.4 billion people could be living in 'water stressed areas' by 2050, according to a 2016 Asia Development Bank report. In addition, dietary changes to more water-demanding meat and dairy products mean demand for water will rise.

Groundwater is a valuable resource for the agricultural sector of Vietnam, especially in the Central Coastal region, which experiences long dry periods (7-9 months per year). Most of the crop production during dry periods is dependent on irrigation by pumping groundwater from shallow aquifers. However, the traditional practice of irrigation by small landholders in this region is wasteful, incurs high labour cost and leads to leaching of essential nutrients that can contaminate the water and render it unfit for use by people or animals.

ACIAR-funded research in the South Central Coastal region of Vietnam to sustainably manage water, soils and nutrients was highlighted in a special session at the Vietnam International Water Conference in Ha Noi on World Water day, 22 March 2019. The project team from the Agricultural Science Institute of South Central Coastal Vietnam, Hue University of Agriculture and Forestry, Institute of Agricultural

Science for South of Vietnam, Nong Lam University and from Australia's Murdoch and Flinders Universities showed that new efficient irrigation technologies could save water for annual and perennial crops by 30-50%, increase in crop yield by 10-30% and increase economic efficiency by 15% as compared to traditional practices of farmers.

The Flinders University and Nong Lam University are now developing a water balance model so that they can assess the effect of different land use scenarios on the groundwater resource. This will help policy makers design policies and regulations that optimize the economic value of the resource for food security and farmers' income while protecting the groundwater resource, especially after long dry spells - a common feature of the South-Central coastal zone.



Dr Richard Bell joining an interview with Vietnam Television's VTV4 channel. Credit: ACIAR Vietnam

MORE INFORMATION:

Dr Richard Bell, Murdoch University
Project leader of the ACIAR project SMCN/2012/069
Email: R.Bell@murdoch.edu.au

Celebrating the World Food Safety Day

A focus on research findings from PigRISK/ SafePORK project

Chi Nguyen and Fred Unger, ILRI

Our team from the ACIAR-funded project 'Market-based approaches to improving the safety of pork in Vietnam', or SafePORK project (LPS/2016/143), joined the rest of the world in celebrating the first ever World Food Safety Day on 7 June 2019. This follows the adoption in December 2018 of a resolution by the United Nations General Assembly to celebrate the benefits of safe food and inspire actions towards preventing and managing foodborne diseases. A range of activities were organized by the SafePORK team during the week of 1 to 7 June to mark this day under the theme 'Food Safety is everyone's business'.

Key messages from the SafePORK project to raise public awareness on food safety along the pork value chain were disseminated through ILRI's social media (Facebook, Twitter and YouTube).



An online contest on food safety was held during the World Food Safety Day. Credit: ILRIVietnam

In a video launched on 7 June, Fred Unger, SafePORK's Principal Investigator shared some key messages that helped Vietnamese people have safer pork. He highlighted that biological hazards (including Salmonella) in food presented a higher risk to human health than chemical hazards. He also recommended good practices at

the household level such as using separate cutting boards for raw and cooked food that can help avoid food-borne diseases.

In line with this day's celebration, quizzes on food safety and a creative contest called 'Food safety, where are you?' were organized, reaching 8,000 people with 3,000 online interactions.



Key research findings from PigRISK/SafePORK were disseminated on ILRI social media. Credit: ILRI Vietnam

An insight into African swine fever in Vietnam

Fred Unger, Hu Suk Lee, Karl Rich, Thanh Nguyen and Hung Nguyen, ILRI

African swine fever (ASF) is one of the most serious diseases in pigs and responsible for huge economic and production losses in affected countries. It is a notifiable disease to the World Organisation for Animal Health (OIE) with its notification leading to immediate trade restrictions.



*A small pig farm in Da Bac district, Hoa Binh province, June 2018.
Credit: ILRI Vietnam*

ASF affects domestic and wild pigs and is caused by a virus of the *Asfarviridae* family. Clinical symptoms vary depending on virulence of the virus and the species of pigs. While some symptoms are similar to classical swine fever, known as 'hog cholera', both diseases are not related as 'hog cholera' is caused by another virus. Acute forms of ASF may have a very high mortality of up to 100%, in other words all infected pigs may die. Sub-acute and chronic forms produce less severe clinical signs including lower mortality but affect pigs over a much longer period leading to productivity losses. No effective treatment or approved vaccine is currently available for ASF. ASF is transmitted by contact with infected domestic or wild pigs or pork products, contact with virus-contaminated materials (e.g. food waste, pork products) or vectors, (e.g. soft ticks), where present. ASF virus can remain infectious for several days in contaminated pens but thorough cleaning and disinfection is effective¹. ASF is not infectious for humans nor does it affect public health². Control measures vary and may include early detection, culling and proper disposal of carcasses and waste, thorough cleansing and disinfection; movement controls and enhancing strict biosecurity measures on farms. Other measures, depending on the epidemiological situation, include good knowledge and management of the wild boar population (e.g. for some European countries) and, where appropriate, also vector control³.

ASF was first described in Kenya in 1921 where ASF virus was transmitted from wild boars to domestic pigs⁴. Since then, ASF has been reported in different African, Europe and Asian countries. In Asian continent, ASF is sweeping through the continent, since the disease was first reported in China in domestic pigs in August 2018 with outbreaks in Mongolia and North Korea (January 2019), Vietnam

(February 2019), Cambodia (March 2019), Hong Kong (May 2019) and Lao PDR (June 2019)⁵.

In Vietnam, the first outbreak of ASF was detected on 1 February 2019 at a 33-pig farm in Hung Yen, a Northern Vietnamese province⁶. The number of reported outbreaks and effected provinces increased rapidly to 23 provinces (in 556 communes) after two months (on 8 April 2019)⁶ and up to 62 provinces/cities with approximately three million pigs culled (on 16 July 2019)⁷⁻⁸. Most outbreaks occurred at small (less than 50 pigs) and medium scale pig holdings (51-200) while large commercial farms with good biosecurity were less likely affected⁹. Quite many households have completely lost their herds. Some families with medium farm size have lost up to US\$50,000 because of ASF. A recent ILRI study in Tien Lu district, Hung Yen province (a SafePORK study site) has shown that ASF not only affected pig farms, but also caused a dramatic drop of pork consumption and of pig prices¹⁰.

The Vietnamese government and relevant authorities have been engaged and supported relevant measures and guidance, which includes early detection, culling, disinfection and compensation, movement control, biosecurity application, risk communication and public awareness, slaughtering pigs and consumption of pig products, sharing and updating information and international collaboration. The Central Committee of Vietnam Communist Party has issued the Directive No. 34-CT/TW dated 20 May 2019 to strengthen the leadership and operations in preventing and controlling ASF and various policies of the government to raise awareness and to mobilize more resources to cope with ASF.

Despite of these efforts, and as in other countries of the region, ASF control remains a challenge. Those challenges include a huge number of small-scale

farms (83% of all), apart from medium scale, are the most impacted groups. They have limited capacity to implement suitable biosecurity measures to prevent introduction of ASF to their holdings. With an estimated number of 2.9 million of this farm type (DAH, 2019) it is also understood that capacity of the vet service reaches its limit to ensure early detection and rapid response.

Special emphasis is given by the Prime Minister office to support small and medium enterprises (Directive No. 42/NQ-CP dated 18 June 2019). This includes compensation for losses due to ASF, varying by pig and farm types, but also support for biosecurity measures and local vet staff. However, challenges remain in practice with the timely payment of compensation to affected farmers. Delayed compensation may result in lower compliance of farmers to control measures, e.g. on depopulation. In response to this the mechanism of support from the central budget versus local have been further clarified (No. 42/NQ-CP)7.

Considering the challenges and on-going spread of ASF in Vietnam, it is expected that the disease remains endemic, at least in medium-term, as short-term eradication is unrealistic. This may result in continued pressure on pig prices, lower profitability of pig farming, which may affect the small scale pig producers.

It is recommended that relevant authorities and actors take the emergence of ASF seriously and that efforts include actions at the ground level and communication with most affected farmers. Furthermore, research to develop an effective vaccine has been intensified. Most recently, this includes promising preliminary results from VNUA, which are currently further consolidated before conclusions can be made.

ILRI has been coordinating with international organisations (FAO and OIE) and MARD in the support to combat ASF. This includes the translation of dissemination materials about ASF and how to prevent introduction at farm, a newly-finalised survey on the impact of ASF to pig producers in Hung Yen, and providing expertise and opinions to national partners on ASF. During a recent Regional Symposium on Research into Smallholder Pig Health, Production and Pork Safety in Ha Noi, 27-29 March 2019, ILRI supported the South-South exchange by inviting ASF researchers from East Africa. ILRI's Bioscience group continues its research on development of a 'subunit vaccine' complemented by a well-established ASF disease infection model in pigs, which includes a scoring system and screening assays for monitoring the immune response of pigs to infection¹¹.

Below are some take-home messages recommended by ILRI:

- Since the first report of ASF in Vietnam in February 2019, the disease has spread to 62 out of 63 provinces/cities and caused approximately three million pig losses.
- ASF is expected to be endemic in the country as short-term eradication is unrealistic.
- ASF is different from classical swine fever, or 'hog cholera' which is caused by another virus.
- ASF does not harm humans.
- There is no treatment or effective vaccine currently available for ASF but research to find a vaccine has been intensified.
- Early detection and fast outbreak control for ASF is crucial to avoiding further spread.
- An effective prevention from ASF is consequent on-farm biosecurity measures. This will also help to reduce other infectious pig disease.
- While there is a compensations scheme for affected farmers, mechanisms to disburse funds could be optimised.

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SafePORK project – Improving the safety of pork in Vietnam



Fred Unger and Hung Nguyen, ILRI

Highlights of the ACIAR-funded ‘Market-based approaches to improving the safety of pork in Vietnam’, or SafePORK project, which is now in its second year. Achievements include a comprehensive food safety performance assessment of key pork value chains for Ha Noi and some neighbouring provinces, pork safety interventions being set up at retailer’s and slaughter’s and student exchange with the University of Sydney.

Food safety performance of key pork value chains in Ha Noi and around

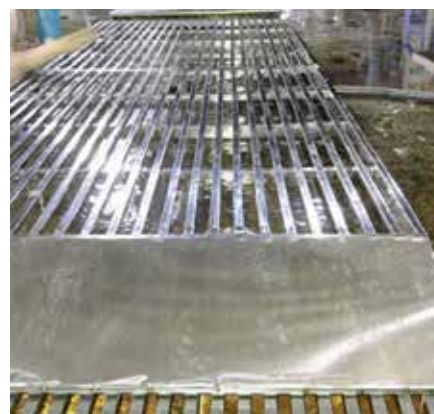
With the aim to assess food safety outcomes of current pork value chains, ILRI together with national partners from Vietnam National University of Agriculture (VNUA), the National Institute of Animal Science (NIAS) and Ha Noi University of Public Health (HUPH) developed and applied a Food Safety Performance Tool. The tool combines qualitative and quantitative methods to collect information on production scale of pork value chains, knowledge attitude and practices on food safety, governance and trust, potential interventions to improve pork safety and also pork safety hazard assessment at retail level.

More than 450 pork value chain actors including producers, butchers, retailers, and consumers were enrolled. 700 pork samples were collected across modern retail (boutique shops and supermarkets) and traditional retail (wet markets, canteens and street food vendors). Results indicate higher trust of value chain actors in food safety in rural areas compared to that in Ha Noi. All value chain actors show lower trust in social media while showing higher trust in traditional media (TV and radio), vets and public health authorities. Value chain actors are more concerned about chemical hazards, for example, antimicrobials or use of growth promoters compared to microbiological hazards. However,

pork sampling results show high rate of biological contamination across all types of retails. At least, 50% of pork samples fail to meet safety standards (pork is considered unsafe if *Salmonella* is found in every 25 grams according to ISO 6579:2002 A1:2007). Overall, modern retail was not found safer than traditional retail. This result has been also reported in a recent study in Ho Chi Minh City, however, with a much smaller sample size.

Progress on interventions

Over the recent months food safety interventions have been identified in a participatory process with targeted actors. Based on results of previous risk assessment interventions to improve pork safety through reduction of microbiological



*Tailored inox grids in a slaughterhouse in Hung Yen province.
Credit: Fred Unger*



Hygienic cutting board that are now being tested on-station.
Credit: ILRI Vietnam

contamination will be piloted at slaughter and traditional retails starting in Hung Yen province.

At slaughterhouse, this will include the use of ozonized water, tailored inox grids to avoid floor slaughter combined with overall improvement of hygiene. Ozonised water is a strong disinfectant and entirely dissolves within a few minutes causing no residues. SafePORK is partnering with private sector partners, Aqua 21 Company, an innovative provider of safe water solutions from the UK. The portable ozone unit has been specifically designed for the targeted slaughter house in Soc Son district. It will allow adjusted ozone levels based on the level of contamination. The unit was installed in July 2019, in alignment with training of butchers on handling the unit and improved hygiene during slaughter practice. Another intervention is a tailored iron grid to reduce contamination of carcasses due to floor slaughter. Such a grid had been already successfully tested in PigRISK.

At retailer's, the use of hygienic cutting boards and clothes, combined with measures such as sellers' frequent washing of meat surfaces and their hands etc. have been identified as good interventions based on previous risk factor analysis. The proposed interventions have been discussed with a range of retailers and received broad compliance. Selected retailers also received some cutting boards to test the feasibility for daily use. An on-station trial has been set up to test anti-microbiological efficacy of cutting boards and sensitivity of hand held devices (food sniffer) to detect contaminated pork. From July onwards, interventions will be piloted with targeted butchers and retailers.

Introduction of behavioural nudge to support interventions

Interventions designed to reduce the burden of food borne illness often require value chain actors to alter their negative behaviour. This has also been shown when piloting the above-mentioned iron grid in a slaughter house in Hung Yen province (during the PigRISK project). It technically works well with the

bacterial contamination of carcasses significantly reduced. The pilot trial also demonstrated that technical solutions need to go along with behavior change of butchers. This desired behavioural change of pork value chain actors may be supported by 'nudge theory', a sub-field of behavioural economics, which describes how individuals can be encouraged to act in a way, which produces a net societal benefit. The SafePORK team has partnered with researchers from the Royal Veterinary College (RVC), UK who provide expertise on 'behavioural nudge' research. Conducted research comprised of focus group discussions, key informant interviews and a stakeholder workshop to gain information from value chain actors on potential 'nudge' to support food safety intervention at slaughter and retail. One element or 'nudge' could be the effect of colour on salience; first findings reflect commonly held beliefs that red has an association with being dirty, and green and blue are associated with health, hygiene, and cleanliness (see pictures 1a&b). The research is ongoing, next step is a trial to test a site-specific nudge at retail (e.g. using positively or negatively framed posters with food safety messages) to allow formal assessment of the nudge's impact on behaviour of targeted retailers.



Positively framed poster (green) and negatively framed poster (yellow). Credit: RVC

Student exchange

To develop capacity on livestock and pig health research and modelling of disease spread and control, a one-month visit at the University of Sydney was arranged for two researchers Luong Nguyen Thanh, HUPH and Ninh Thi Huyen, NIAS who are key implementing partners of the SafePORK project. They are now studying at the Veterinary Faculty of the University of Sydney.

ACIAR PROJECT: LPS/2016/143: 'Safe Pork: Market based approaches to improving the safety of pork in Vietnam'

MORE INFORMATION:

Dr Fred Unger, International Livestock Research Institute,
f.unger@cgiar.org

Enhancing bivalve production

Checking oyster growth and survival in floating rafts at Ban Sen. Credit: Michael Dove

Wayne O'Connor and Michael Dove, Port Stephens Fisheries Institute

Researchers from Vietnam and New South Wales (NSW) have a long history of collaboration, working together for almost 15 years to build mollusc industries in Northern Vietnam. The collaboration began in 2005, following a visit by the Vietnamese Minister for Fisheries to NSW and a subsequent study tour of bivalve culture facilities and farms in Northern Vietnam by Australian researchers. That tour highlighted significant opportunities for bivalve industry development and made a number of recommendations, including the development of hatchery technology for oysters. Those recommendations were adopted in the ACIAR Project of *'Building bivalve hatchery production capacity in Vietnam and Australia'*, which commenced in 2007 and established the basis for this project. In the latest program we have used the experience gained in developing and disseminating bivalve culture knowledge in Vietnam by the Research Institute for Aquaculture No. 1 (RIA1) and the NSW Department of Primary Industries (NSW DPI) to continue to develop small-scale agro-enterprises in rural Vietnam that will promote profitable and environmentally sustainable use of coastal and near-shore resources.

At the outset of this research there was little oyster production in Northern Vietnam. Progressively production has grown on the back of increasing spat supply. Today farming is spread across 28 provinces and production has been conservatively estimated to have exceeded 50,000 tonnes/annum. Community involvement has increased with an estimated 2,500

coastal-dwelling families now benefitting from the oyster industry. The processing and marketing sectors are also expanding. New processing facilities have been constructed and investment in the industry continues. While the vast majority of production is consumed locally and the estimates for potential growth in local markets indicate far greater supply is needed, international companies have shown an interest in export opportunities.

A number of significant scientific advances were made during this project. Fundamental to ensuring the future of oyster farming in Vietnam, we have confirmed the identity of the species of major interest as the Portuguese oyster (*Crassostrea angulata*). We have demonstrated that the oyster stocks present in Vietnam are sufficiently genetically diverse to form the basis of a pedigreed oyster breeding program. The highly-replicated rearing systems and production protocols needed to produce oyster family lines have been established and three generations of more than 450 oyster families have now been produced. These families have been assessed for key performance traits including growth and survival and the stock now being produced is acknowledged by farmers as superior to that from any other source, in particular imported stocks. Critical to the future of the breeding program, we have ensured that RIA1 staff have the requisite skills to maintain the breeding program that has been established.

To provide a framework of support for the developing industry, a series of audits of mollusc biosecurity,

mollusc health diagnostic capacity and oyster quality assurance were undertaken by independent experts and the outcomes of those assessments were used to direct ongoing research and guide training exercises. Considerable focus was placed on mollusc health management, with over 20 staff from various government institutions receiving training. To detect and manage threats to the industry, a water quality monitoring program has been established to regularly collect environmental data on farms that include physio-chemical parameters, nutrients, metals and bacterial contaminants. The project acknowledges that harmful algal is harmful to oysters, however, we do not detect any biotoxins in commercial oysters. Then we have worked to develop algal sampling and identification skills as well as identifying potential pollution sources through shoreline surveys.

The program has had a strong emphasis on capacity development. Three RIA1 staff members involved in the ACIAR project had been offered with John Allwright fellowships (JAF) to study PhD programs in Australia. Specifically, Vu Van In completed his research on oyster genetics and returned to Vietnam to lead the National Marine Broodstock Centre in Cat Ba. Cao Truong Giang studied assessments of the capacity of selective breeding to develop a genetically improved strain of Pacific white leg shrimp (*Litopenaeus vannamei*). The third JAF, Vu Van Sang, has commenced a PhD program to investigate selective breeding in the Portuguese oyster, *Crassostrea angulata*. Two other RIA1 staff have recently begun PhD studies in Australia under the government scholarship scheme: Nguyen Viet Khue with a program involving molecular assessments of changes in bacterial communities in and around oysters during disease events, and Le Tuan Son with a research on bacteriophage control of pathogenic *Vibrio* sp. resulting in mortality of larval oysters in hatchery production.

Genetic and environmental monitoring studies to underpin oyster industry development are providing useful insights to better manage the environment and risks posed by aquaculture development. The potential translocation of pests and diseases through stock introductions has been a major concern. The confirmation that the primary commercial species in Vietnam is *C. angulata* reduces this risk by discouraging the importation of extraneous species (e.g. *Crassostrea gigas*), which are readily available from overseas suppliers. Our work to demonstrate sufficient diversity exists within local stocks of *C. angulata* to establish a breeding program will further reduce the need for stock imports. While seed produced from RIA1 is already acknowledged as superior, the progression of a breeding program

will further increase the quality of stock available with an additional economic disincentive to import. Collectively, these measures will reduce the biosecurity risks associated with unregulated oyster imports.

The program is about to end. It concluded with a final workshop in Ha Long City on 4 June 2019 to discuss the achievements of the ACIAR program over the last five years and future opportunities for oyster production in Northern Vietnam. The workshop was attended by representatives from RIA1, RIA2, Regional Institute of Marine Fisheries, government officials from Quang Ninh, ACIAR, NSW Department of Primary Industries as well as oyster industry stakeholders, including farmers and companies selling oyster products. Oyster production in Northern Vietnam continues to expand and evolve. Floating longline systems are replacing bamboo rafts and rapidly spreading to new areas. These systems increase oyster growth, survival and enable more efficient harvesting of oysters. Hatcheries and industry alike reported on the benefits of using selected oysters developed by RIA1 and are committing support for the breeding program to continue into the future. There is an increasing demand for high quality seed and new hatcheries are being established in consultation with RIA1. Industries are keen to increase product quality and market value through investment in single seed technology and are looking to collaborate with RIA1 to transfer their farming methods from cultch set production to effective single seed systems.

Despite the success of this program, there are still considerable opportunities to improve bivalve production in Vietnam. These include expanding the current oyster-breeding program and applying innovative molecular genetic techniques to permit better identification of the specific causes of stock loss and determining the potential for selective breeding to address those causes. There remains work to be done in improving the understanding the impact of known oyster pest species (*Stylochid flatworms* and *spionid polychaetes*) in Vietnam to permit practical, on-farm control methods to be developed along with the protocols (including timing and frequency) for their use. There are also strong opportunities to apply the lessons learned with oysters to other species, such as otter clams, where selectively breeding for resistance to siphon disease could see production re-established.

ACIAR PROJECT: FIS/2010/100: 'Enhancing mollusc production in Northern Vietnam and New South Wales'

MORE INFORMATION:

Dr Wayne O'Connor, Project Leader, NSW Department of Primary Industries, wayne.o'connor@dpi.nsw.gov.au

Giant grouper and hybrid grouper bring prosperity to fish farmers

Josephine Nocillado and Abigail Elizur, University of the Sunshine Coast

In many Asian countries, fish is not only considered as a source of health-promoting nutrients but also as a symbol of good luck and abundance. Groupers are highly regarded for their excellent nutritional properties and for bringing good fortune. They are essential in banquets during special occasions and important events. The giant grouper is particularly sought after because of its delicate meat and collagen-rich skin.

In the live reef fish food trade in Asia, the demand for groupers has increased considerably in the last two decades and has been consistently higher than supply. This has led to a growing investment in grouper aquaculture to meet consumer demand. The usual practice has been to collect fingerlings and juveniles from the wild and grow them to market size in ponds or cages, however this approach resulted in rapid decline of wild grouper populations. In countries like Vietnam and the Philippines, it is no longer easy to catch groupers from the reef areas where they live. Breeding in captivity has been attempted by Southeast Asian countries, but according to farmer's experience, groupers, and especially giant grouper, are challenging to propagate in captivity.

ACIAR has funded a 6-year-project to develop technologies for giant grouper aquaculture in Vietnam, the Philippines and Australia. The commissioned organisation is the University of Sunshine Coast in Australia, Research Institute for Aquaculture No.1 and No.3 (RIA1 & 3) in Vietnam, and the Southeast Asian Fisheries Development Center Aquaculture Department (SEAFDEC/AQD) in the Philippines. The main issues that the project addressed were the lack of knowledge on the maturation and spawning behavior of giant grouper and their low larval survival rate as well as developing tools for genetic management of the broodstock to prevent inbreeding and produce hybrids.

One of the challenges in giant grouper aquaculture is their huge size at maturity, which size at first breeding can range from anywhere between 20 and 40 kg. After maturing as females and producing eggs for some years, some fish then changes sex into functional males. At this point, the fish is even much bigger, from 40-60 kg at least. This considerable size makes giant grouper broodstock difficult to maintain in tanks or cages and to handle during sampling. Another challenge in giant grouper aquaculture is the



Farm harvest of hybrid grouper (A), transport (B) and packing (C). Credit: Truong Quoc Thai



Hybrid grouper on display in a restaurant (A), hybrid grouper sashimi (middle dish) (B) and steamed hybrid grouper (C). Credit: Truong Quoc Thai

susceptibility of the larvae to viral diseases that cause mass mortalities at the early hatchery stage.

Fast growth and disease-resistance are two desirable characteristics of a species for aquaculture. Giant grouper is ideal because of its fast growth, reaching market size in less than one year compared to other groupers, however giant grouper larvae are not that disease-resistant. In addition, giant grouper larvae have tiny mouths, which limit the type of live food that can be provided to them at first feeding. One method to overcome these issues is through hybridization with other grouper species that can complement the qualities of giant grouper. Interspecies hybridization has been observed among groupers in the wild. Through the capacity building endeavors of the ACIAR-funded giant grouper project and the consistent efforts of our partners, RIA1&3, Vietnam now has a new hybrid grouper crop which is both fast growing and disease-resistant. The hybrid grouper, a cross between male giant grouper and female tiger grouper, has the suitable qualities of a species for aquaculture. Vietnamese fish farmers are enjoying the benefits of the new hybrid grouper industry that significantly grew just in the last five years. The availability of locally produced live hybrid groupers for the local restaurants is also boosting the tourism industry because groupers are very popular among domestic and international tourists. Indeed, the hybrid grouper has brought forth good fortune to many sectors of the Vietnamese community. After all, it's a grouper!

ACIAR PROJECT: FIS/2012/101: 'Development of mariculture technology for giant grouper in the Philippines, Vietnam and Australia'

MORE INFORMATION:

Professor Abigail Elizur, Genecology Research Centre, University of the Sunshine Coast, gaya.elizur@gmail.com

Successful agroforestry options in Northwest

Detail of the longan (right), maize (left) and fodder-grass (centre) system in Yen Bai province. Credit: Do Van Hung

Tran Ha My and Vu Thi Hanh, ICRAF

Evaluation of seven options for agroforestry systems has shown delivery of economic and environmental benefits and applicability to other locations.

On 7-9 May 2019, Dr Nora Devoe, ACIAR Forestry Research Program Manager paid a mid-term review visit to the project *'Developing and Promoting Market-Based Agroforestry and Forest Rehabilitation Options for Northwest Vietnam'* (AFLI-II). The project is carried out in three Northwest provinces of Vietnam and implemented by the World Agroforestry Research Organisation (ICRAF) Vietnam, with funding from ACIAR from 2017-21.

'This project has been very valuable in terms of livelihoods and the environment,' said Dr Devoe. 'Farmers benefit directly from grasses, fruit trees and short-term agricultural crops. The trials are really good because of their ability to restore fertility and stabilize sloping land.'

She also emphasized that farmers were sharing with others the knowledge and experiences about agroforestry that they had gained from the project.

The agroforestry systems are now replacing the monocultural production, which causes widespread deforestation and degradation of land in Northwest Vietnam. Thanks to the evidences produced by various trials of different options of agroforestry systems in three provinces after nine years, the options are now being expanded in six 'agroforestry landscapes' covering 300 ha. Nearly 200 farmers are establishing community tree-nurseries and participating in growing the systems. The options were designed to be more economically and environmentally attractive to farmers than the monocultural maize system.

The evaluation of seven established agroforestry options has shown that they have been delivering economic benefits and feasible to apply in locations with similar natural and economic conditions. The return-on-investment (ROI) period was two years for a longan, maize and fodder-grass system in Van Chan district, Yen Bai province. Profits were predicted to increase gradually, reaching their maximum in the seventh year. The average yearly profit over 20 years was expected to be about 55 million dong (approximately A\$3,400) per ha. The net profit of maize monoculture was only 9-10 million dong (A\$560-625) per ha a year.

Another option, Son Tra (*Docynia indica*) and fodder grass in Toa Tinh district, Dien Bien province, showed an ROI from the third year. The annual profit was predicted to be more than 50 million dong (approximately A\$3,125) per ha a year in the year seventh to 14th and more than 30 million dong (approximately A\$1,870) per ha a year in the fifth and sixth and 15-20th year.

Research on Son Tra continues to be carried out with the succession of the phase 1. At the same time, the project has been cooperating with farmers of the Northwest Tea and Specialties Co., Ltd., TAFOOD (Subsidiary of Hiep Khanh Co., Ltd., HITEACO) to conduct research on soil amendment of 15 existing hectares of Son Tra in Bac Yen, Son La. In addition, the connection of agroforestry products with private enterprises is being promoted to open an active consumer market for the project's products. Some companies such as TAFOOD, Hoang Duong

Production and Trading Joint Stock Company, BIGGREEN Vietnam Fresh Food Company are starting to set quality standards of products in order to reach an agreement with project's farmers.

In terms of environmental impacts, from the second year onwards, the agroforestry options demonstrate 50-77% reductions in soil erosion, compared to the maize monocultural one.

Mapping of suitable agroforestry options was also studied in three provinces along with research on integrated landscape management in Na Nhan and Dien Bien. According to Dr Vu Tan Phuong, Vietnam Academy of Forest Science, 'GIS (geographic information systems) will be used in 2019-2020 to create maps of the landscape in Son La'.

Part of the project is to find the best way to rehabilitate degraded forests through research sites in Dien Bien and Son La provinces. More than 100 households participated in replanting 20,000 seedlings on nearly 100 ha in the two provinces.

'Regenerated forest may not contain as much values as natural forest itself, such as biodiversity or habitats for plants and animals', said Dr Devoe, 'however, in the context of Northwest Vietnam, forest regeneration is useful and valuable not only for the forest but also for the people, especially, for those whose livelihoods depend on the forest', she added.

Also, in the final review, Dr Dang Thinh Trieu of Vietnam Academy of Forest Science addressed initial challenges to rehabilitate forests such as unfavourable weather and climate, pests and diseases or lack of collaboration of farmers who had fear of failure or change of land use.

In addition to working closely with research institutes and local government departments, especially

Department of Agriculture and Rural Development in Son La, Yen Bai and Dien Bien provinces, the project also collaborates with local and international universities, such as Southern Cross University in Australia on capacity building; and Tay Bac University in Son La province on the various agroforestry trials.

Dr Devoe said *'A close and professional interaction and collaboration among project partners is an important prerequisite for the success of a project. I expect that this will be maintained and further developed until the end of project in 2021'.*

About the project AFLI-II:

The project 'Developing and Promoting Market-based Agroforestry and Forest Rehabilitation Options for Northwest Vietnam' (2017-2021) inherited AFLI-I results from 2011-2016. AFLI-II has five objectives: 1) *to quantify and evaluate the performance of generic agroforestry options and tree species to underpin investment in agroforestry;* 2) *to understand the suitability of different agroforestry options in relation to various contexts and develop markets and policy to scale up adoption;* 3) *to understand the ecological and economic values of degraded forests and co-develop rehabilitation methods with communities;* 4) *to understand the drivers of land-use change and develop cross-sector planning approaches for landscapes, integrating forests and agroforestry land uses;* and 5) *to develop the local capacity for agroforestry, forest rehabilitation and integrated landscape management.*

ACIAR PROJECT: FST/2016/152: 'Enhancing market-based agroforestry systems and rehabilitation of degraded forests in Northwest Vietnam'

MORE INFORMATION:

Mr La Nguyen, World Agroforestry Centre, l.nguyen@cgiar.org



A small part of a 50 ha agroforestry landscape in Mai Son district, Son La province. Credit: Tran Ha My

The first ACIAR alumni gathering event in Vietnam



34 alumni showed their strong commitment to build a network of researchers in Vietnam.
Credit: Trong Chinh

ACIAR Vietnam brought together its alumni in a gathering event in Nha Trang from 15 to 17 May 2019. The first event of this type for ACIAR alumni attracted participation of 34 John Allwright and John Dillon Fellows, who joined for practical experience exchanges, alumni network strategy development and team bonding.

The alumni are key managers, senior experts and researchers from ACIAR's partner institutions in Vietnam. They are working in a wide array of areas, from fishery, forestry, livestock systems, soil science, to agricultural policy and agribusiness. Throughout the two-day program, the alumni shared their professional achievements and concerns, received updates from ACIAR, and discussed how to support each other in the future.

As part of the program, the participants also visited the research site of an ACIAR funded project (*'Increasing technical skills supporting community-based sea cucumber production in Vietnam and the Philippines'*), led by Dr Nguyen Dinh Quang Duy, Deputy Director of National Broodstock Center for Mariculture in Central Region, Research Institute for Aquaculture No.3 (RIA3). Dr Duy is also one of the John Allwright Fellowship (JAF) alumni. He said *'The first meeting of ACIAR John Dillon and John Allwright alumni event gave me the opportunity to get to know, learn and exchange information and experiences with everyone. This is*

an opportunity to create a connection to help each other generate ideas, which support our daily work in the most effective way. I personally feel satisfied because I had a chance to share information and experiences about the initial results of this ACIAR funded project to the other peers'.

Ms Nguyen Thi Thanh An, ACIAR Vietnam's Country Manager shared *'The John Allwright and John Dillon Fellows alumni from Vietnam have greatly contributed to the fruitful partnership between ACIAR and Vietnamese partner institutions, and more broadly, Australia and Vietnam's bilateral relations. And we are very grateful for those partnerships'.*

The alumni collectively agreed to create a research network and commit their active involvement in future events. *'If you want to go far, go with ACIAR alumni'* commented by Dr Nguyen Huu Nhuan - Deputy Dean of Department of Quantitative Analysis, Faculty of Economics and Rural Development, Vietnam National University of Agriculture.

By bringing the alumni together, ACIAR Vietnam demonstrates our continued commitment to building capacity of researchers and institutions in Vietnam and other developing countries to carry out research projects for agricultural development./.



Dr. Nguyen Phi Hung with his children in Australia.
Credit: Nguyen Phi Hung

Sharing from Dr Nguyen Phi Hung

I am Nguyen Phi Hung, a John Allwright Fellow alumnus. I was born in Tuyen Quang, a Northern mountainous province of Vietnam. As a researcher with agronomic background, I worked in this region for 15 years and in 2015, I received the John Allwright Fellowship from the Australian Centre of International Agricultural Research (ACIAR) to pursue my PhD program.

I was impressed when I first saw Australia during my flight from Ha Noi to Sydney: a huge country, surrounded by the blue ocean and green forests. The fresh air and clean environment gave me a sense of new life when I arrived in Sydney. The University of Sydney's symbolic great hall amazed me and other students the most. I later felt much proud of being a student of the university ranking top 40 universities in the world.

I am fascinated with the agriculture sector and I want to be a successful researcher. My PhD research focused on greenhouse gas (GHG) emissions in horticulture. While this topic was rather new to me, I found it challenging but very interesting. I soon understood that GHG emissions in agriculture was one of the most significant matters, leading to climate change and global warming. My main research objectives were to investigate baseline nitrous oxide emissions with their driving factors and to identify strategies to reduce these emissions in vegetable and fruit orchard fields.

One of my key activities was the fieldwork, which was carried out in both countries for almost three and a half years. Such visits enabled me to observe differences of vegetable production systems between Australia and Vietnam. In Australia, vegetable and fruit orchards were industrialized with mechanization

in large areas of 50 ha per household on average, while in Vietnam, there were only small farm sizes of about hundred square meters, fitting farmers' manual works. About 40-50% Vietnamese people engaged in agriculture while Australian farmers only account for 3-5% of the population.

During my time in Australia, I gradually realized that PhD study here was a progress of becoming an independent researcher. Apart from enriching knowledge and skills from literature, I became more confident to actively involve in processes of research activities such as designing experiment, writing proposals, conducting study and reporting results.

Apart of studying, my family and I enjoyed Sydney, one of the most beautiful and liveable cities in the world. Living in this city brought us happy and unforgettable moments. We created a group of several families. We shared food, had road trips and carried out many social outdoor activities together, which made us enjoyable and released stress from study and work.

My dream of pursuing higher education in Australia came true with supports from John Allwright Fellows, scholarship management officers, my supervisors and their teams, friends and my beloved family. My university generously provided me with resources to complete my research study. All together, they contributed in many ways to shape, inspire and help me to grow. I thank and appreciate all those valuable supports and I would like to contribute what I gained from my study in Australia to my country. My slogan is 'helping others grow is also growing yourself in an active and positive way'. I am committed to sustainable development in agriculture and to building a strong network of research coming from Australia, the region and Vietnam.

ACIAR Student Internship Program

The ACIAR Student Internship Program has been operating for three years. Masters or PhD students who are studying in Australia can apply to complete internships through ACIAR. Each intern is provided with financial support to complete a three-month project (including up to six weeks in country).

Internship opportunities are proposed by ACIAR projects when they identify they have a need for additional skills and knowledge to address an emerging research question. So far nine students have undertaken internships addressing research questions in agribusiness, integrated pest management and women's engagement.

The aim of the Internship Program is to bring new skills and knowledge to ACIAR project teams through matching projects with exceptional student interns. They also give students a unique and valuable in-country experience building an alumni of graduates who may consider a career in international development research.

The internships have consistently secured extremely high-quality students. Supporting interns is part of ACIAR's commitment to building research capacity and creating future career paths for students in international development.

In 2017, student Long Le from Melbourne Business School worked with researchers from University of Queensland and partner organisations in Vietnam to complete an ACIAR internship. Long's project task was to develop a business case for a market linkage app linking farmers, traders and processors in the cassava value chain. Long brought his prior Southeast Asia work experience and applied his skills in app (including knowledge of IT products), business case development and stakeholder engagement to complete the project.

ACIAR Projects who would like to host an intern are encouraged to contact the Program Coordinator Ms Anwen Lovett at anwen.lovett@gmail.com or +61418284169 or Skype [anwenlovett](https://www.skype.com/en/contacts/anwenlovett).

Credit: Khanh Long

Interview with a farmer

Mr Lo Van Ngoai, Quai Nua commune, Tuan Giao district, Dien Bien province



Farmer Lo Van Ngoai in his garden. Credit: ICRAF Vietnam

Mr Lo Van Ngoai is a beneficiary of the project 'Developing and Promoting Market-Based Agroforestry and Forest Rehabilitation Options for Northwest Vietnam' (FST/2016/152). The project aims to develop and promote market-based agroforestry options to improve livelihood and enhance forest and landscape management. Thanks to participation of Ngoai and other farmers in the project, we can implement agroforestry trials and scale up at landscape. Ngoai's family has changed their planting system on sloping land in a sustainable approach that helps to diversify income and sources of livelihood.

1. What are three sentences describing best about yourself?

I am a farmer, living with farm and field. I love planting trees.

2. How do you engage with ACIAR projects in Vietnam?

I started working with the ACIAR project since 2013. I did not know techniques of planting and growing fruit trees so I decided to join the project to learn these techniques. I want to share those with other farmers and encourage them to join the project as well.

3. What do you like most about working with ACIAR?

I am very happy that the plants grow well. I receive fertilizer and seedlings from the project.

4. What do you dislike most about working with ACIAR?

Nothing has been unhappy since I joined the project.

5. What are your future plans?

If the project continues in my village, I want to cooperate with the project to grow more fruit trees and share this model with other neighbourhood farmers.

6. Please share one of your most memorable experiences with ACIAR projects?

Since joining the project, many farmers have harvested peach and longan. Especially, we have chances to visit and learn from other successful models elsewhere.

Interview with a researcher

Rodd Dyer was the Research Program Manager (RPM) Agribusiness with ACIAR between 2011 and 2018. Rodd has an academic background in agriculture, specializing in animal science, rangeland ecology and management and agricultural economics.

For fifteen years, Rodd was fortunate enough to undertake research in extensive beef cattle systems throughout Northern Australia. Following that, he spent time doing a PhD in the Philippines and Scotland, UK. He then went on to be Project Manager for the Meat and Livestock Australia Northern Beef Program before coming to ACIAR. Rodd is passionate about supporting collaboration and innovation to achieve profitable, sustainable and inclusive development in tropical agriculture. Rodd has three wonderful children: Amali and Asha, and a little son Taylor. He is now based in Ha Noi, Vietnam working independently with his wife Nga, through their small business FocusGroupGo, providing support to agriculture and agribusiness research and development throughout the Asia Pacific region.

1. What are there three sentences (or five objectives) describing best about yourself?

Umm... determined, energetic and curious... about things that interest or excite me.

2. How do you engage with ACIAR projects in Vietnam?

Vietnam was my first country to visit with ACIAR as an Agribusiness Research Program Manager. I will always remember the friendly welcome and incredible assistance from the ACIAR Country Office as they guided me around some amazing countryside, meeting incredible people and partners and visiting projects that really make a difference to rural people. I will always remember the sense of optimism and energy in the country.

Working in international research and development was always an ambition but my plans got side-tracked by taking on some interesting and lengthy positions in rural Australia. But from what I knew about ACIAR it was my dream job. And out of the blue an opportunity came up.

3. What do you like most about working with ACIAR?

The people. The places. The projects. ACIAR is like a big family. Not just in Canberra but across the world.

4. What do you dislike most about working with ACIAR?

Reading more than four project proposals the night before In House Review (IHR). IHR is one of the most stimulating and rigorous part of ACIAR. It is also an amazing learning opportunity. However, it often

requires a lot of reading, and unless you are super, super organized, this means some very late nights, trying to stay awake getting ready for IHR the next day.

5. What are your future plans?

To try and recreate a job like I had in ACIAR, at least the good bits... but working independently and for my wife!! Also to slow down a little. I'll let you know how that goes!

6. Please share one of your most memorable experiences with ACIAR projects.

That's tough. There are many. Memorable... possibly for the wrong reasons... drinking maize wine for breakfast (only twice),... lunch ... and dinner... with farmers and partners in the Northern mountains of Vietnam... and repeating. Travelling on the wonderfully slow overnight train from Ha Noi to Lao Cai, then going out to meet farmers from different ethnic groups in Sa Pa district, surrounded by incredible scenery. Seeing the rapid economic transformation of poor farmers who started growing and marketing vegetables as part of an ACIAR project. Being associated with the start of a new industry that benefits people in need is incredibly satisfying.



Chatting with Tam Hoa plum farmer in Moc Chau. Plums provide important cash income to many ethnic farmers in the district. Photo provided by Rodd Dyer

Stir-fried sea cucumber with Shiitake mushrooms

This recipe is shared by Dr Nguyen Dinh Quang Duy and refined by Chef Nguyen Manh Hung.



Credit: Vu Bao Khanh

Ingredients

- 200g fresh sea cucumber (or frozen sea cucumber)
- 100g fresh shiitake mushroom
- 1 tbsp lard (or vegetable oil)
- 20g sliced carrots
- 50g snow peas
- 50g celery
- 2 scallions
- 1 chilli pepper
- 4 cloves garlic
- ½ tsp sugar
- 1 tsp salt
- Pepper powder

Method

Wash sea cucumber or defrost frozen sea cucumber.

Slice sea cucumber into bite-sized pieces. Chop scallion into matchsticks. Smash garlic.

Heat the frying pan. Add lard onto the pan and fry it until it is hot enough.

Add garlic into the frying pan and stir evenly until fragrant. Add sea cucumber and mushroom. Continue to stir-fry for 3 minutes until they are cooked.

Add carrots, celery, snow peas, and chilli pepper to the frying pan and stir-fry until they are tender-crisp.

Season to taste then start plating. Serve when it is still hot.

Behind the dish

Dr Nguyen Dinh Quang Duy works at Research Institute for Aquaculture No. 3 (RIA3) in Nha Trang and has been at the forefront of hatchery development of sandfish. He completed his PhD at James Cook University in early 2017 under the ACIAR John Allwright Fellowship program. His PhD study focused on the use of micro-algae concentrates in hatchery culture of sandfish and the information generated used as a basis for optimising larval diets in the ACIAR project. Dr Duy has a passion for sea cucumbers and has researched this field since 2001 when he joined the ACIAR project *‘Expansion and diversification of production and management systems for sea cucumbers in the Philippines, Vietnam and Northern Australia’* (FIS/2010/042). At present, he continues his research on this topic with the ACIAR project FIS/2016/122. Apart from research, Dr Duy is especially interested in cooking, and usually cooks healthy dishes from sea cucumber for family and friends.

ACIAR’s research is aimed towards commercial-scale hatchery and grow-out technologies for sandfish, improving the livelihoods of coastal communities and preserving the balance of the marine ecosystem.



The Australian Centre for International Agricultural Research (ACIAR) is part of Australia's international development cooperation program. Its mission is to achieve more productive and sustainable agricultural systems for the benefit of developing countries and Australia. ACIAR commissions collaborative research between Australian and developing-country researchers in areas where Australia has special research competence. ACIAR also administers Australia's contribution to the international agricultural research centres.

ACIAR Vietnam is one of the ten country/regional offices and we have been active in Vietnam for 26 years (1993-2019).

Contact Us:
ACIAR Vietnam Office
Tel: +84-24 3774 0265
Email: aciarvietnam@aciar.gov.au

Australian Embassy
8 Dao Tan Street
Ba Dinh District
Hanoi, Vietnam.



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