International Trade Centre

TRADE IN PYTHON SKINS: IMPACT ON LIVELIHOODS IN VIET NAM

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Abstract for trade information services

This paper examines the impact of the international python skin trade on the livelihoods of people in Viet Nam. It explores the demographic of python trade participants and identifies the factors necessary for improving the livelihood resilience and capacity of people engaged in python trade. The report is relevant for importers and exporters, regulators, policymakers, non-governmental organizations, community representatives and researchers seeking to improve sustainability of the python skin trade and the associated benefits derived by local people in Viet Nam.

The International Trade Centre (ITC) is the joint agency of the World Trade Organization and the United Nations.

ITC, Palais des Nations, 1211 Geneva 10, Switzerland (www.intracen.org)

Foreword ITC

The majority of the world's poorest live in rural areas and in developing countries, largely dependent on natural resources for food, shelter, medicine and income. For this reason, the protection of the forests and oceans are two of the 17 Sustainable Development Goals (SDGs) agreed by United Nations members in 2015.

Trade has been recognized as a 'means for implementation' of the Global Goals, and particular attention should be given to trade in natural resources given the contribution this can make to addressing Global Goal 1: the reduction of poverty. In 2012, the International Trade Centre (ITC) and the Convention on the International Trade in Endangered Species (CITES) signed a Letter of Agreement where ITC committed to provide knowledge and capacity-building for Parties to CITES in order to strengthen the sustainability and livelihood benefits of their trade in wildlife.

These studies – 'Trade in Python Skins: Impact on Livelihoods in Viet Nam' and the accompanying publication 'Trade in Python Skins: Impact on Livelihoods in Peninsular Malaysia' – are ITC's direct contribution to this agreement.

Following the publication of an ITC report in 2012 identifying sustainability, legality and animal-welfare issues in the python supply chain, ITC, together with the World Conservation Union's Boa and Python Specialist Species Group and Kering, a Group of Luxury and Sport & Lifestyle brands, established a public-private partnership called the Python Conservation Partnership (PCP).

This PCP is a unique example of a United Nations organization, the private sector and scientists working together to tackle sustainability issues in trade. It has pooled financial resources as well as expertise on markets, the fashion business and conservation biology. This has resulted in the provision of scientifically sound evidence for policymakers, in particular CITES Parties, to regulate trade more effectively. It has brought a business reality to the discussion and created greater awareness in the industry around options for enhancing the sustainability of trade in the species. Finally, it has identified capacity-building needs for traders, authorities and the communities managing wildlife.

As part of its contribution to PCP, ITC has carried out an analysis of the livelihood benefits of the trade in python skins in Viet Nam. Despite the high visibility of the trade on the catwalks of Milan and London, there is very little awareness about who derives an income from the trade and how value can be increased for rural livelihoods. By carrying out this research, ITC and PCP present evidence that the captive breeding of python skins is creating hundreds of jobs in Viet Nam. These incomes contribute to social stability and can lead to more inclusive societies with less poverty.

I would like to thank the Boa and Python Specialist Group of the IUCN Specialist Survival Commission, the CITES Authorities in Viet Nam, the CITES Secretariat, Kering and its brand Gucci for their collaboration and support in producing the research.

I remain confident that the findings will contribute concretely to discussions at the 17th meeting of the Conference of the Parties of CITES in September 2016 and beyond, as well as direct a greater level of interest and resources towards improved sustainable management and livelihood benefits from the trade in flora and fauna.

Arancha González
Executive Director
International Trade Centre

Foreword CITES

Python breeding in Viet Nam has started since the 1980s and rapidly expanded over the last two decades due to (i) increased demand and (ii) domestic restrictions on wild harvest. The closed-cycle captive breeding system for pythons in Viet Nam is typical that a small number of large farms produce many hatchlings that are given or sold to a large number of small "satellite farms" for raising; after approximately one year, satellite farms then sell adult pythons back to the large farms for slaughter and/or export. These satellite farms are mostly at household scale.

For strengthening python breeding management and improving the sustainability, transparency, animal welfare and local livelihoods for the python skin trade, Viet Nam CITES Management Authority has supported the Python Conservation Partnership in conducting research works on python farming, skin trade and their impact on local livelihoods in Viet Nam.

In the above context, this research aims to provide insight into: (i) the role of the trade in supporting local livelihoods in Viet Nam; (ii) social and trade-related challenges facing Vietnamese python farmers; and (iii) opportunities to improve local trade benefits.

This research work has revealed that the livelihood impacts of farming pythons are overwhelmingly positive in Viet Nam. In particular, the satellite farming model has proven particularly effective in engaging large numbers of poor rural households and offering reliable income and improved wellbeing. However, the household scaled python farmers are facing challenges such as limited capacity to invest in pythons and cages, and to develop the skills required for breeding and/or processing pythons; to manage the environment for the pythons including reducing potential disease, improving hygiene and managing ambient temperatures; and to have a sound understanding of the international markets to which they supply.

Overall, the findings and recommendations from this research work actively contribute to the improvement of management of python breeding, sustainability of the python skin trade and the associated benefits derived by local people in Viet Nam.

Finally, I would like to pay tribute to the authors as well as the Python Conservation Partnership (Kering, International Trade Center and IUCN Boa & Python Specialist Group) for their close cooperation and hard work in conducting this research project.

Ha Thi Tuyet Nga
Director
Viet Nam CITES Management Authority

Acknowledgements

About the Python Conservation Partnership

Collaboration between Kering, ITC and the Boa and Python Specialist Group of the International Union for Conservation of Nature (IUCN SSC Boa & Python Specialist Group), the Python Conservation Partnership (PCP) was established in November 2013 with the aim of contributing to the improved sustainability of the python skin trade and to help facilitate industry-wide change. The PCP's research programme focuses on study and recommendations to improve sustainability, transparency, animal welfare and local livelihoods for the python skin trade.

About the International Trade Centre

The International Trade Centre (ITC) is the joint agency of the World Trade Organization and the United Nations. ITC supports businesses in developing countries to become more competitive in global markets, speeding economic development and contributing to the achievement of The 2030 Agenda for Sustainable Development. ITC works with policymakers, trade and investment support institutions, exporters and other stakeholders in the public and private sectors to enable export success of small and medium-sized enterprises in developing countries and transition economies.

About the Boa and Python Specialist Group

The Boa and Python Specialist Group (BPSG) is a global network of volunteer experts, part of the IUCN Species Survival Commission (SSC). The BPSG is the leading world authority on boas and pythons. Its mission is to provide expert opinion and scientific advice to IUCN and other conservation organizations, government and non-government agencies, applicable to the conservation of boas and pythons.

About Kering

A world leader in apparel and accessories, Kering develops an ensemble of powerful Luxury and Sport & Lifestyle brands: Gucci, Bottega Veneta, Saint Laurent, Alexander McQueen, Balenciaga, Brioni, Christopher Kane, McQ, Stella McCartney, Tomas Maier, Boucheron, Dodo, Girard-Perregaux,

JeanRichard, Pomellato, Qeelin, Ulysse Nardin, Puma, Volcom and Cobra. By 'empowering imagination' in the fullest sense, Kering encourages its brands to reach their potential in the most sustainable manner. Present in more than 120 countries, the Group generated revenue of more than €11.5 billion in 2015 and had more than 38,000 employees at year end. The Kering (previously PPR) share is listed on Euronext Paris (FR 0000121485, KER.PA, KER.FP).
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Tables, Figures and Boxes

Abbreviations

Unless otherwise specified, all references to dollars ($) are to United States dollars, and all references to tons are to metric tons.

The following abbreviations are used:

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CTIP	Ca Mau Trade Tourism and Investment Promotion Centre
DFID	United Kingdom Department for International Development
FPD	Forest Protection Department
GDP	Gross domestic product
GSO	General Statistics Office of Viet Nam
ITC	International Trade Centre
IUCN	International Union for Conservation of Nature
PCP	Python Conservation Partnership
SSC	IUCN Species Survival Commission
VND	Vietnamese dong

Executive Summary

Trade in Python Skins: Impact on Livelihoods in Viet Nam is the third report delivered by the Python Conservation Partnership (PCP). PCP is a collaboration between the International Trade Centre (ITC) and the International Union for Conservation of Nature (IUCN SSC Boa & Python Specialist Group) and Kering, that was established in November 2013 to contribute to a robust and sustainable python skin trade and to facilitate industry-wide change. PCP's research program focuses on developing science-based recommendations to improve sustainability of the python skin trade, and through enhanced transparency ensure benefits for local livelihoods and high standards of animal welfare.

The trade in python skins has attracted increasing international attention in recent years, particularly among those concerned about the overexploitation of python species. As such, efforts to improve transparency and sustainability in the supply chain are growing, as are attempts to understand the impact of the trade on the livelihoods of rural households and communities.

This report focuses on understanding the socioeconomic benefits of the python skin trade for people in Viet Nam and is based on the results of research by the Python Conservation Partnership (PCP). The purpose of the research was to provide insight into (1) the role of the trade in supporting local livelihoods in Viet Nam, (2) the social and trade-related challenges facing Vietnamese python farmers, and (3) opportunities to improve local trade benefits. Furthermore, the report provides information relevant to ensuring that trade interventions mitigate potentially adverse impacts on local livelihoods and development outcomes.

Python farming and trade in Viet Nam

An estimated 1,000 households in Viet Nam farm and trade pythons (*Python molurus bitvittatus* and *Python reticulatus*). The animals are captive-bred primarily for their skins, which are exported to international markets in Europe and Asia (mostly China). The skins are used as raw materials in luxury products and high-end musical instruments. By-products such as meat, fat, bones and gall bladders are also sold in local and regional markets.

The captive breeding of pythons has been prevalent since the 1980s, but has expanded rapidly over the last two decades in response to growing market demand and domestic restrictions on the wild harvest of pythons. More households have entered the trade in recent years, attracted by income opportunities.

Livelihood assets of python farm households

Livelihood assets were defined by five types of capital: human (e.g. education and literacy levels), social (e.g. business connections and informal networks), physical (e.g. infrastructure and equipment), financial (e.g. income and savings) and natural (e.g. land, water and biodiversity).

Python farming was found to benefit households' livelihood assets. Beyond contributing to financial stability, python farming enabled households to broaden skills and social networks, and to afford important physical assets such as housing, transport and energy. Some livelihood concerns include health risks associated with poor farm cleanliness and the dependence of some very poor farm households on financial loans to meet living costs.

Livelihood strategies of python farm households

Python farmers have diverse backgrounds, with the average farmer surveyed active in the trade for 11 years. Python farming was seen as a good business opportunity, often generating better returns than other farming activities, such as rice cultivation, pig farming and other types of reptile farming. Several farmers began python farming as a hobby, later making it their main livelihood activity. In addition, pythons and other snakes are often kept as a food source, much like household chickens.

Trade participants identified other advantages of python farming beyond financial returns, such as relatively little time investment and limited new skills needed as well as its low start-up costs. Furthermore, python farming can be undertaken at home, with work shared among household members. Given the low

time, skills, capital and huma resources investment needed to engage in the python farming business, it is a practical way to diversify household income.

Livelihood outcomes of trade participation

The python skin trade supports around 1,000 households in Viet Nam and offers a means of employment, income diversification and poverty alleviation. The relative benefits for income and wellbeing vary widely among participants depending on their role at the farm and the farm's size. Nevertheless, the contribution of the trade to income and livelihood resilience among poor households is significant. For most farmers, python farming offers an opportunity to diversify income, particularly in areas where households had previously relied solely on small-scale agriculture with little opportunity for additional cash income.

Farmers also mentioned positive social, community and household benefits from python farming. Most python farmers would like to carry on farming for the next 10 years and hope their children will continue the business. Almost all farmers would recommend the business to their friends as a good livelihood strategy.

The captive breeding model has reduced conservation risks associated with trade in pythons from Viet Nam. None of the participants in this study relied on wild pythons for their farm operations or to meet export demand. However, this does not guarantee that small numbers of wild-caught pythons aren not entering the supply chain.[1]

Challenges facing python farmers

Python farmers in Viet Nam face a range of challenges relating to business operations, trade participation and their broader operating environment.

Data indicate that the earning potential of farms heavily depends on the capacity of farmers to invest in pythons and cages, and to develop the skills required to breed and/or process pythons. Most small farmers were keen to expand their business, but lacked the financial capital and technical resources to do so.

A large number of farmers were concerned about how to manage the environment for pythons, including reducing potential disease, improving hygiene and managing ambient temperatures. While some of the bigger farms have the equipment and technical skills to manage these challenges, this was not the case for most of the smaller farms.

Farmers do not have a sound understanding of the international markets they supply. This creates vulnerability among farmers, as they have little capacity to respond to changes in market demand in terms of quantity and types of skins depending on the species and length, among other factors. When considering the impact of a hypothetical European ban on python skins from Viet Nam, most farmers were confident in the ability of the Asian market to absorb additional product. In this case, farmers appeared to underestimate the significant economic impact associated with reduced access to key international markets.

While some farmers expressed fears about poor roads, electricity prices and water supplies in rural Viet Nam, few raised concerns about their community and living standards, even among very poor households.

Implications for capacity-building

This research project has revealed that the livelihood impacts of farming pythons are overwhelmingly positive in Viet Nam. In particular, the satellite farming model has proven particularly effective in engaging large numbers of poor rural households and offering reliable income and improved wellbeing.

The analysis has also identified areas where governments and the international community could enhance the contribution of the python trade to local livelihoods through actions that improve farm management practices, expand the capacity of small farms to breed and provide access to relevant market information.

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[1] Natusch and Lyons, 2014

Capacity-building will probably be most effective where it can use face-to-face training and extensions services, and draw on social networks already existing between farmers themselves to provide practical solutions improving productivity and profitability. It seems to be impractical for the authorities in Viet Nam to register all small farm operations. An alternative could be to establish and register regional farmer groups or associations; this could also improve the dissemination of information and best-practices among farm households.

Farmers were observed to be highly innovative and adaptable, with most adopting new and improved farming practices in the past five years. The study concludes that there is likely to be strong engagement and uptake of practical measures disseminated through capacity-building that will improve the sustainability and associated local livelihood benefits of the international trade in python skins.

Introduction: Python trade and economic opportunity

Sustainable trade in wildlife products provides many livelihood opportunities for smallholder farmers and rural communities. Export of these products can advance economic development, provide employment and create opportunities for income diversification and poverty reduction.[2]

Strong demand for python skins from the luxury fashion industry provides an economic opportunity for communities and businesses in many South-East Asian countries. More than half a million skins are estimated to be exported from South-East Asia annually, worth approximately $25 million at the export stage.[3]

However, little is known about the socio-economic and livelihood impacts of the python skin trade for regional businesses and communities. The number of households that are dependent on the trade, and the economic and other possible incentives to participate, are also not well understood. Furthermore, better understanding is needed of the potential impact of changes in management regimes and international policy to ensure that sustainable trade interventions are consistent with local livelihood strategies.

This report presents research undertaken by ITC, as part of the Python Conservation Partnership (PCP), to improve understanding of the socio-economic and livelihood aspects of the python skin trade. The research had the following major objectives:

- to review the role of the python skin trade in supporting local livelihoods in Viet Nam;

- to explore some of the social and trade-related challenges Vietnamese python farmers are facing; and

- to identify opportunities to improve local trade benefits and enhance livelihood resilience for those involved in the trade.

The findings are relevant for businesses (particularly international buyers of python skin), policymakers, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and others looking to shift towards a more traceable and sustainable value chain for python skins. In particular, it will provide information relevant to ensuring that shifts in policy and/or buyer requirements achieve their objectives without unforeseen consequences for rural households dependent on the trade.

The report is structured as follows: Chapter 1 provides an overview of the wildlife trade in Viet Nam, including trade in python skins. Chapter 2 outlines the approach to livelihoods analysis used in this study, along with specific research methods applied. Chapter 3 shares the results of the livelihoods analysis. The final chapter outlines some implications for capacity-building.

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[2] Roe, 2008

[3] Ashley, 2013; Kasterine et al., 2012

Chapter 1   Python trade in Viet Nam

1.   Wildlife farming and trade

Wildlife farming and trade is the primary economic activity of thousands of Vietnamese households. Commonly farmed species include porcupine (*Hystricomorph Hystricidae*), soft-shell turtles (such as *Pelodiscus sinensis*), long-tailed macaques (*Macaca fascicularis*), water snakes (such as *Enhydris* spp. and *Homalopsis buccata*), crocodiles (*Crocodylus siamensis*), pythons (including *Python molurus bitvittatus* and *Python reticulatus*) and a number of aquatic species.[4]

The captive breeding and export of wildlife species has been popular since the 1980s, and has contributed significantly to the income of households and communities.[5] In most cases, these species are farmed for food and traditional medicines, but also meet demand for clothing, luxury products and pets. Most wildlife products are consumed domestically or in neighbouring East Asian countries, particularly China. China is recognized as the region's largest consumer market for wildlife.[6]

2.   Python farming and trade

Captive breeding of pythons in Viet Nam began in the 1980s, and became the primary source of production in response to protection of wild specimens under national laws due to diminishing wild populations. In 1998, both Burmese (*P. m. bivittatus*) and reticulated pythons (*P. reticulatus*) were categorized as critically endangered in Viet Nam, and wild harvest was prohibited (Government Decree No. 32/2006/ND-CP of 30 March 2006). In recent years, the industry has seen renewed growth, partially in response to promotion of trade through the media and by provincial governments as a beneficial income opportunity.[7]

Thousands of households in Viet Nam depend on the international trade in python skins to support their livelihoods. According to the CITES Trade Database[8], Viet Nam exported 146,500 Burmese python skins and 139,200 reticulated python skins to Singapore, Italy, China and Germany (among other destinations) in 2012.

The python skins, produced almost entirely through captive breeding, are destined for the international leather industry, primarily for luxury fashion items and Chinese musical instruments[9] By-products of python-skin production – including meat, fat, bones and gall bladders – enter the domestic market as food, medicine and beauty products.

Large farms participating in breeding, slaughter and export must be registered with the relevant provincial Forest Protection Department (FPD). According to FPD records, there are 486 registered farms across Viet Nam, 413 of which are located in the southern provinces surrounding the Mekong Delta. There are also hundreds (if not thousands) of smaller, unregistered farms, raising pythons in a similar fashion to 'backyard chickens'. Most of these are 'satellite' farms involved in raising hatchling pythons to market size.

Most Vietnamese python farms breed only Burmese pythons, with just 25 reportedly breeding both Burmese and reticulated pythons. Burmese pythons appear to fetch a higher price per

The Forest Protection Department of Ca Mau Province inspecting a python farm.
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[4] Thompson, 2008; Aust, 2015

[5] Chung et al., 2003; Nguyen et al., 2008

[6] UNODC, 2013

[7] Thompson, 2008; Natusch and Lyons, 2014

[8] UNEP-WCMC, 2014

[9] Natusch and Lyons, 2014

skin on international markets, and the species seems to be more readily adaptable to captive-breeding conditions.

Pythons are farmed under intensive management in a closed-cycle production system. Breeding stock is sourced from established local closed-cycle python farms.[10]

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[10] The farming system – including breeding, raising and slaughtering methods – is detailed in Natusch and Lyons (2014).

Chapter 2   Research approach

1.   Framework for livelihood analysis

Livelihood analysis is a widely applied tool used for understanding the livelihoods of the poor. The term 'livelihood' can have multiple interpretations, but is generally understood to comprise 'the capabilities, assets and activities required for a means of living'.[11] A livelihood is considered sustainable 'when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base'.[12]

This study broadly follows the Sustainable Livelihoods Framework for Livelihoods Analysis, developed by the UK Department for International Development (DFID). The framework can be applied and adapted to local circumstances using a participatory research approach.[13] In the past decade, it has been widely adapted by development practitioners to understand rural development issues. The framework has three core components: livelihood assets, livelihood strategies and livelihood outcomes. The general premise is that households pursue livelihood outcomes by drawing on a set of assets to undertake a range of activities or strategies.

In applying the framework, this study examines each element as follows:

- Livelihood assets: Examines how households draw on different assets. Most commonly, assets are defined by access to five types of capital: human capital, social capital, natural capital, physical capital and financial capital (see Box 1).

- Livelihood strategies: Examines how households draw on assets to derive livelihood outcomes. These include activities people undertake and choices they make to reach their livelihood goals, such as python farming and trade. The livelihood assets of households directly influence their livelihood strategies.

- Livelihood outcomes: Examines the outcomes of livelihood strategies and may include higher income, improved wellbeing, reduced vulnerability and more sustainable use of natural resources.

As shown in Figure 1, household assets, activities and livelihood outcomes may be influenced by personal preferences and priorities as well as external factors including, for example, policies, governance processes, seasonal constraints, economic shocks and changes to the environment.[14]

This study reviews the livelihood assets and strategies of python trade participants and the resulting contribution to livelihood outcomes, including income, employment and other livelihood benefits. Using participatory research methods, the focus is on the needs, concerns and priorities identified by people themselves.

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[11] DFID, 1999.

[12] Ibid.

[13] Ibid.

[14] Ashley and Hussein, 2000

Box 1.   Types of capital

The livelihoods of python farmers can be characterized by their assets as defined by five types of capital: human capital, social capital, physical capital, financial capital and natural capital, identified in the Sustainable Livelihoods Framework (DFID, 1999).

- Human capital

Human capital reflects the skills, knowledge and abilities that enable people to pursue livelihood strategies (DFID, 1999; Schultz, 1961). It varies between households according to household size, age of members, education, training and experience, among other factors.

- Social capital

Social capital comprises the network connections that households can draw upon in pursuing livelihood strategies (DFID, 1999; Sobel, 2002). It may include membership of formal networks (such as a producer association) or a set of informal connections and acquaintances. Business connections, including supplier-buyer relationships, also contribute to social capital.

- Physical capital

Physical capital includes the infrastructure, tools and equipment needed to support livelihood activities. It includes assets such as access to transport, energy, shelter and buildings. Lack of physical capital can significantly limit livelihood strategies and outcomes for households (DFID, 1999).

- Financial capital

Financial capital comprises the financial resources that households use to adopt livelihood strategies and achieve livelihood outcomes, including income, credit and savings (DFID, 1999; Kanji et al., 2005).

- Natural capital

Natural capital includes the natural resource stocks that support livelihoods, such as land, water and biodiversity resources (DFID, 1999).

Figure 1.   A simplified sustainable livelihoods framework
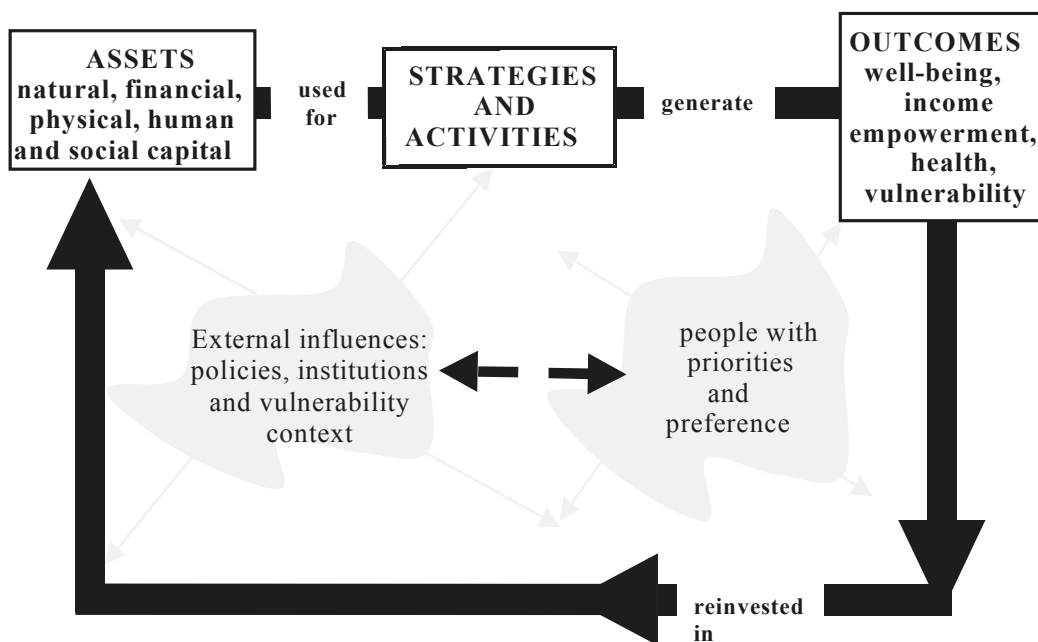
Source: Ashley and Hussein, 2000 (Adapted from DFID, 1999, and Carney, 1998)

2. Research method

Study site

The majority of Viet Nam's python farms are located in the southern provinces surrounding the Mekong Delta. The livelihoods assessment was conducted in three regions: Ho Chi Minh City, Ca Mau and An Giang. The three regions were selected due to the high levels of trade in python skins to international markets.

Viet Nam is a lower middle-income country that has seen rapid economic development in the past decade. Its economy depends on services (41.7%), industry and construction (38.6%) and agriculture (19.7%).[15] Nearly a quarter of the population lives in the Mekong Delta, and generates 90% of rice exports and 73% of farmed fish and shrimp products.[16] While 75% of the workforce in the Mekong Delta is involved in agricultural production, most require additional work to sustain their livelihoods (Garschargen et al., 2012).

The poverty rate in the Mekong Delta was 9.2% in 2013, although there remains inequality between rural and urban areas and poverty is higher among ethnic minorities such as the Khmer (GSO, 2013). According to government definitions, poor households include those with a monthly income below $19 per capita in rural areas and below $24 per capita in urban areas[17] (VGP, 2015). Agriculture (particularly subsistence paddy farming) and fishing remain the dominant livelihood activities among poor rural communities and ethnic minorities.[18] These farmers have insecure livelihoods at risk from low productivity, poor market information and access, economic risks and environmental pressures.[19]

Figure 2. The three provinces in southern Viet Nam where python farmers were interviewed

Source: Authors' elaboration based on ITC household survey, 2015.

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[15] GSO, 2013

[16] GSO, 2013

[17] Throughout this paper, a 2013 exchange rate of $1 for 21,000 VND is used.

[18] Garschargen et al., 2012

[19] Garschargen et al., 2012

Ho Chi Minh City

Ho Chi Minh City is the largest metropolitan city in Viet Nam and has a population of 7.9 million people. Located in the South-East region of Viet Nam it covers an area of 2,095 square kilometres ($km^{2)}$. In 2013, gross domestic product (GDP) per capita was $4,000, more than double the national average $1,911.[20] Mining, construction, seafood processing and tourism are major industries, with agriculture comprising just 1% of the economy.[21]

Python farms in Ho Chi Minh City are located in the suburban outskirts where population density is lower than the inner city. These are in the northernmost areas of Ho Chi Minh City, specifically Cu Chi District and District 12.

An Giang

An Giang Province is located on the border of Cambodia and is considered the trade gateway for the Mekong Delta provinces. The province covers 3,500 km^2 and has a population of 2.1 million.[22] An Giang's major industries are rice, fisheries, services and trade. Average annual income per capita was $1,550 in 2013.[23] Strong economic development in recent years has seen poverty rates decline to 5.7% in 2013, although they remain high (19%) in ethnic-minority households.[24]

While some python farms are in the main city, Long Xuyen, the majority are in the northernmost region, An Phu, and Tri Ton District.

Ca Mau

Ca Mau Province is 360 km south-west of Ho Chi Minh City, covers 5,300 km^2 and has a population of 1.2 million.[25] It is accessible by road, though most local transport is by boats and barges through the canals. Ca Mau hosts most of Viet Nam's fishery production and trade, particularly shrimp farming. Per capita GDP in Ca Mau was $1,342 in 2013.[26]

Python farms are located throughout Ca Mau, including several large breeding and processing farms coupled by, as reported by locals, thousands of satellite farms. In some poorer rural areas, such as Binh Thoi, it is reported that up to 80% of households have at least one python.

A python farm on the second story of an apartment in the city of Ca Mau, southern Viet Nam.
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2.1.   Data collection and analysis

Field data were collected using face-to-face surveys in May 2014. The survey included a general livelihood assessment, an evaluation of python trade activities and an assessment of training and capacity-building needs. The survey was tested during the first day of fieldwork and adapted accordingly. The survey was semi-structured and distinguished between farm owner/managers and employees.

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[20] World Bank, 2013.

[21] GSO, 2014

[22] GSO, 2014

[23] An Giang Province Portal, 2014

[24] GSO, 2014

[25] GSO, 2013

[26] CTIP, 2014

Permission to conduct the research was given at the national and provincial level. The Viet Nam CITES Management Authority (Administration of Forestry – Ministry of Agriculture and Rural Development) and provincial Forestry Protection Departments supported the research and assisted in identifying registered python farms in each province. Two officers, from the CITES Management Authority and from the Institute of Tropical Biology respectively, assisted with interpretation.

Large python farms were identified from records held by the local Forest Protection Department. Many smaller farms were then identified using 'snowball' sampling, whereby respondents informed interviewers of additional python farms[27] in nearby areas. Given that total populations are unknown, a target sample of 25 farm households per region was selected based on accessibility of farms as indicated by FPD officials. As a consequence, representativeness of the samples may have been slightly biased. However, the study team endeavoured to sample a mix of households with a diverse cross-section of python farming activities (including breeders, processors and satellite farms) and broader livelihood strategies.

A total of 59 managers[28] and 17 employees were surveyed. All households surveyed had a minimum of one member participating in at least one python skin trade activity, including breeding, raising, processing and exporting. For household surveys, interviews were conducted with the head of the household, or the next most senior person. Approaching participants in their own environment, typically their home, enabled interviewers to gain a contextual understanding of the livelihood activities and general welfare of trade participants.

Survey data were checked for completeness and accuracy before being processed. Data processing included editing, coding, classification and tabulation.[29] Descriptive analysis and synthesis of the survey data were undertaken to create a livelihood profile of various trade participants. Household-level data were aggregated to avoid identifying individual households whose personal information remains confidential.

Interviews were not compulsory, and all farmers were informed of the study objectives before interviews began. Participants were told that the results would be anonymous and confidential.

2.2.   Survey limitations and constraints

The survey collected self-reported information provided by respondents on the basis of their recollections. Only one in three farmers maintain records for their farm business, yet these were either not readily available or respondents were unwilling to share them with the study team. As such, some information may be missing or imprecise. Further, some respondents declined to provide detailed income and expenditure information. To overcome this difficulty, the net income from python farming has been estimated from average price and quantity data more readily collected from respondents and used to create profiles for several 'typical' farm types: breeders, processors, small satellite farms and employees.

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[27] Eligible python farmers included all households raising at least one Burmese or reticulated python for the international skin trade.

[28] Sixty managers were originally interviewed, but one was excluded from the sample as he was raising pythons for the pet trade rather than the skin trade.

[29] Kothari, 2004

Chapter 3   Livelihood profiles of python farmers

1.   Python farmers' livelihood strategies

1.1. Socioeconomic information

A total of 76 households participated in the survey, including 59 python farm owners (managers) and 17 python farm employees. The respondents were from Ho Chi Minh City, An Giang and Ca Mau (see Table 1).

The respondents were all of Kinh (ethnic Viet) (82%) or Khmer (Cambodian) (17%) ethnicity, with the exception of one who was Han Chinese (see Table 2). Kinh is the dominant ethnic group in Viet Nam, accounting for 86% of the population. Khmer people were mostly living in Ho Chi Minh City or An Giang, near the Cambodian border. Vietnamese was the dominant language used in all households that were surveyed. A small number of participants (17%) also spoke a second language, such as Khmer (n=8), Cantonese (n=2) or English (n=1).

Table 1.   Job type and location of respondents

	Ho Chi Minh City	An Giang	Ca Mau	Total
Managers	14	23	22	59
Employees	11	3	4	17
Total respondents	25	26	26	76

Source: ITC household survey, 2015

Table 2.   Ethnicity of respondents

	Ho Chi Minh City	An Giang	Ca Mau	Total
Kinh	19	19	24	62
Khmer	5	7	1	13
Han Chinese	0	0	1	1
Total respondents	24	26	26	76

Source: ITC household survey, 2015

Python farming is suitable for people of all ages and education levels. Managers ranged from 25 years old to 69 years old, with a median age of 44, and employees ranged from 20 years old to 60 years old, with a median age of 25. Employees were typically younger, with 70% in their twenties (see Figure 3). Most trade participants had completed secondary school or high school. Some (9%) had had no formal schooling, and only 5% had attended university. Respondents self-assessed their literacy level, and most indicated intermediate to advanced literacy (reading and writing skills); only two (both managers) were illiterate (see Table 3).

On average, python farms supported five household members (see Table 4). The majority of respondents (90%) had children, with an average number of 2.4 children per household. Where all children were older than 20, only 35% worked on the farm, yet many were supported by the business (76%). Several farmers were also supporting their elderly parents living within the household.

Most employees lived at the farm premises and were given full board alongside their employment wage. Of the six that were married with children, four lived off-site with their families and two had families living elsewhere.

While most managers (and all employees) were male, three of the python farm owners were female, and about one in five farms (19%) was jointly operated with a spouse.

Figure 3.   Age of respondents (n=74)
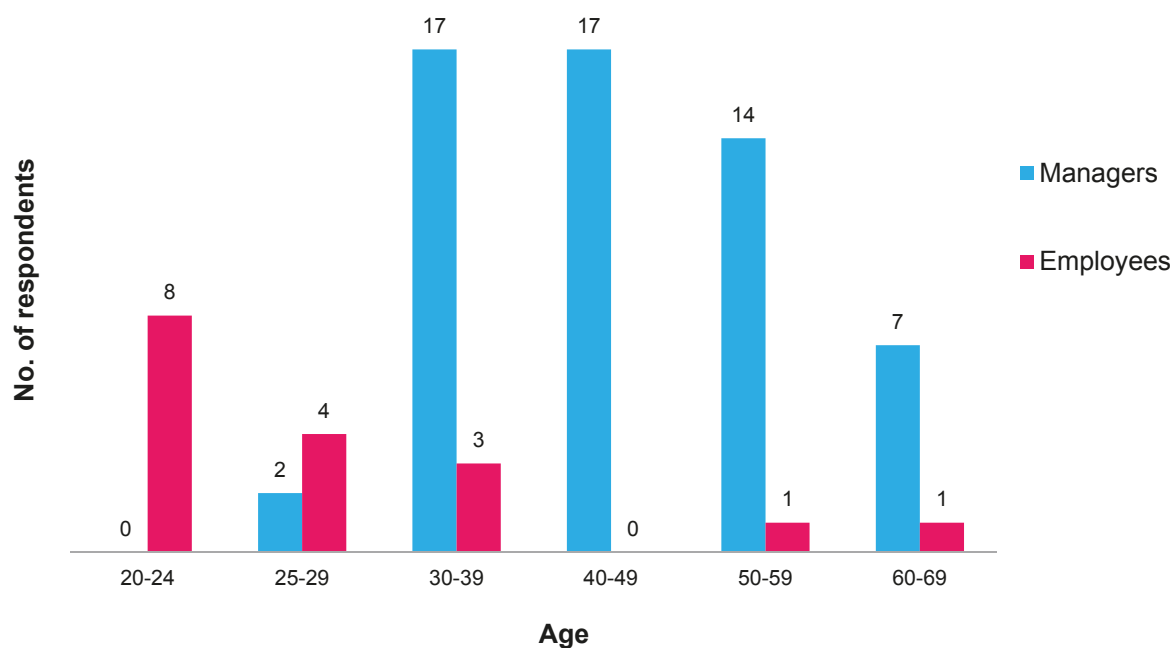
Source: ITC household survey, 2015

Table 3.   Education and literacy of respondents (n=74)

Level of schooling	Years of schooling	Managers (n=57)	Employees (n=17)	All respondents (n=74)
No formal education	0	9%	0%	7%
Elementary	6	21%	24%	22%
Secondary	9	33%	47%	36%
High	12	32%	29%	31%
University	14	5%	0%	4%
Literacy				
Illiterate		4%	0%	3%
Basic		19%	12%	18%
Intermediate		19%	41%	24%
Advanced		58%	47%	55%

Source: ITC household survey, 2015

Table 4.   Household characteristics of python farm managers

Household characteristic	Average / Share	Median	Min	Max	No. respondents
Years in village (no.)	35.5	37	5	69	n=58
Years farming python (no.)	10.6	10	1	30	n=59
Household size (no. of persons)	5.2	4	1	15	n=58
Age manager	45.3	44.0	25	69	n=57
Age spouse	42.2	40.5	22	61	n=54
No. children	2.4	2.0	0	8	n=59
No. children under age 20	1.2	1.0	0	5	n=59
Children supported by business (%)	91.8				n=49
Education manager (no. of years)	8.8	9.0	0	14	n=52
Diversified income activities (% of respondents)	43.1				n=58
Government support (% of respondents)	3.4				n=58
Remittances (% of respondents)	6.0				n=50
Home/Farm ownership (% of respondents)	98.2				n=57
Raise animals for food (% of respondents)	60.1				n=56
No. of TVs		2	1	8	n=58
No. of motorbikes		2	0	10	n=58
No. of cars/trucks		0	0	3	n=58
No. of cell phones		1	0	14	n=58
Internet use (%)	43.1				n=58
Households without gas or electricity for cooking (%)	6.8				n=59
Household savings (% of respondents)	25.4				n=59
Household debt (% of respondents)	36.2				n=58

Source: ITC household survey, 2015

1.2.   Livelihood assets

The livelihoods of python farmers can be characterized by their assets as defined by five types of 'capital': human, social, physical, financial and natural, identified in the Sustainable Livelihoods Framework (see Section 2.1).

Human capital

Python farmers have diverse education and literacy levels (see Table 3). An advantage of the industry is the low skill requirements. Most farmers have not received formal training in python farming, but have learned the trade from neighbours, family and other farmers. Some with fewer farming skills experienced difficulties with stock losses, possibly in part due to inadequate knowledge about farm hygiene, cleanliness and ectotherm biology in general.

Social capital

Python farmers and perhaps households in Viet Nam more generally, illustrated strong connectedness to their local neighbourhoods. Most were open by nature and willing to share their business experience with others. A quarter of managers began python farming specifically as a result of positive recommendations from family and friends. Furthermore, python farming proved to contribute positively to the social capital of households participating in trade. While only seven respondents were in a group or association targeted to

discussion about python farming[30], 70% said they learned python farming from other farmers and 72% said they discussed python farming regularly with other python farmers.

Physical capital
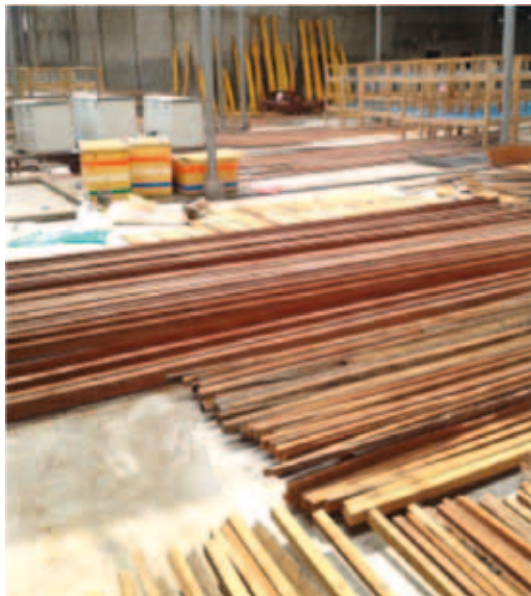
Construction of new cages at a farm in Viet Nam. Cage space is often the limiting factor for business expansion and growth. © Daniel Natusch

The physical assets of python farmers varied substantially. For example, some owned multistory homes and several vehicles, while others lived in semi-permanent houses (without a solid roof or outer wall made of concrete, tiles, bricks or durable wood) with a few basic rooms and relied on wood for cooking. The vast majority of households (93%) used gas for cooking, with 32% also using electricity (see table 4). Only three respondents had no mobile phone and only four had no motorbike. The average python-farming household had 2.1 televisions, 0.6 computer, 3.2 mobile phones and 2.4 motorbikes. Only 12% of households had a car or truck. Fewer than half (43%) of farming households used the Internet.

One advantage of python farming is that people can keep and raise pythons in their homes. Only two large farmers lived in urban residences away from their farms. The respondents' capacity to breed and raise pythons was largely dictated by the number of cages they owned.

Farmers had between 1 and 2,000 cages for pythons, with some larger cages housing multiple pythons (see Figure 4).

When asked how they would invest 50 million VND, 40% of farmers said they would buy more cages in order to expand their business, suggesting cages are the physical asset most important to their livelihood strategy and the most notable constraint to improving livelihood outcomes.

Figure 4. Number of python cages per household
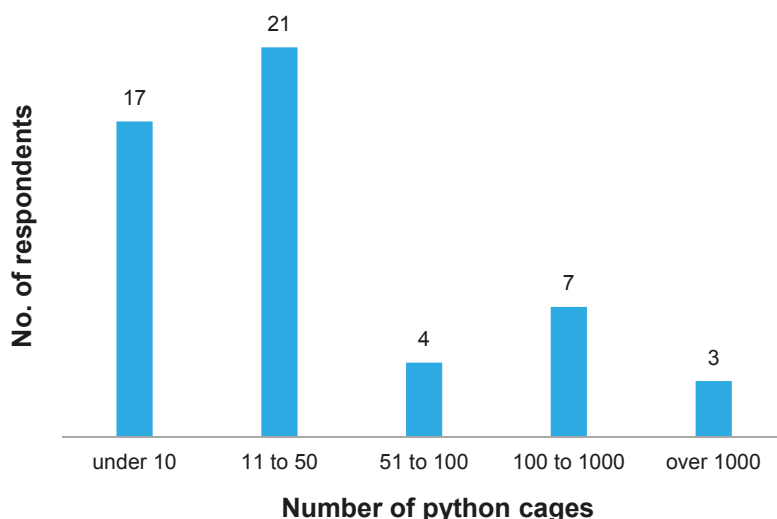
Source: ITC household survey, 2015

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[30] 7 Responds are from Ho Chi Minh City

Figure 5.   Investment priorities identified by Vietnamese python farmers

Legend:
- additional pythons — 27%
- additional cages and pythons — 27%
- additional cages — 13%
- additional femaled for breeding — 12%
- improve farm infrastructure (ventilation, flooring, cages) — 8%
- adopt new techniques (feeding, disease treatment) — 5%
- nothing / unsure — 8%

Source: ITC household survey, 2015

Financial capital

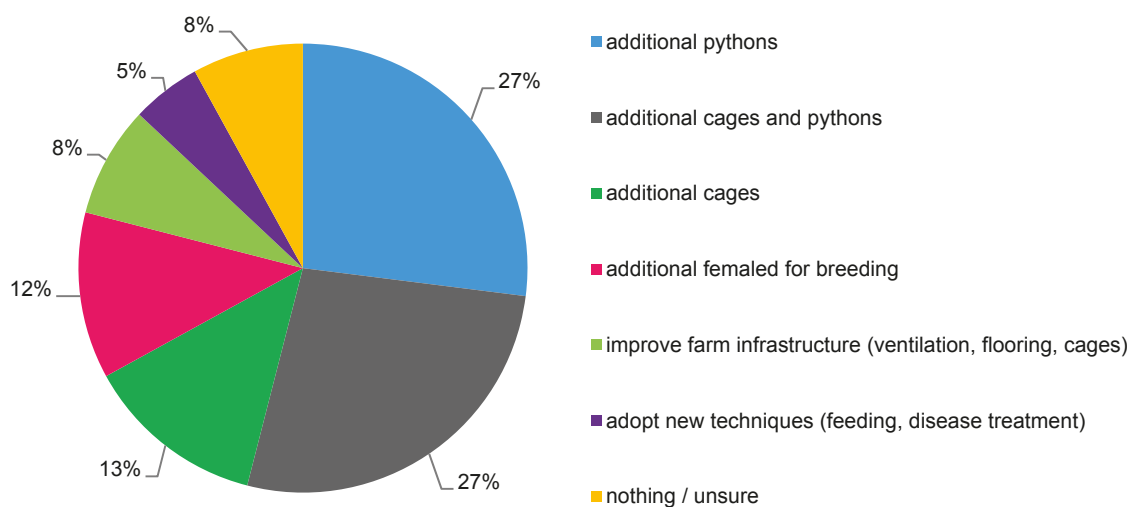Python farmers have diverse income levels, depending on python farming and other business activities (see Section 3.1.3). Earnings from python farming are reportedly stable from year to year. The majority believed their returns for 2014 would be higher than 2013.

Only 25% of the interviewed python farmers had any household savings. Most reported that farming profits were spent on living costs or invested back into the farm business. A larger proportion of farmers, namely 36% of the interviewed farmes had debt. Around a third of those with debt were small satellite farms, most of which had taken on debt to contribute to living or housing costs. Several small farmers expressed concern about the difficulty of accessing loans and government support, indicating that loans were often available for other livestock farming but not for pythons. Those that had loans had generally taken these from private lenders or friends.

Natural capital

All farmers owned the land they used for housing and python farming (typically the same premises). Some also had a plot of agricultural land (27%), land used for another business or for rental income (15%), or land with another home for family members (5%).

Importantly, python farming in Viet Nam no longer depends on wild python resources, which are significantly depleted outside of protected areas. Six farmers (10%) disclosed that they had taken pythons from the wild in the past. One farmer revealed that people bring him 'escapee' pythons found in rice fields. Another said he 'borrowed' wild male pythons for breeding. The remaining majority (97%) were not taking or using pythons from the wild.

Impact of python farming on livelihood assets

Python farming was generally observed to positively affect households' livelihood assets. Python farming enabled households to broaden skill sets, develop new social networks and afford physical assets such as housing, transport and energy. Financial assets gained through python farming contributed to living costs and household resilience. Python farming using the Vietnamese captive breeding model appears to have eliminated reliance on wild python stocks.

The potentially negative impacts of python farming include the risks to human health associated with poor hygiene and cleanliness. Many farms were observed to be poorly maintained and lacked adequate sanitation and ventilation, posing a risk to human and animal health. In general, only large enterprises had invested in better ventilation and cage quality to address these concerns.

Furthermore, several python farmers remained very poor and dependent on loans to meet living costs. While python farming had contributed to household income, many were unable to expand their business and income potential due to poor access to credit.

Table 5.   Impact of python farming on livelihood assets

Impact on	Positive impacts	Negative impacts
Human capital	Requires new skills and abilities often passed on to other family or community members.	Poor hygiene and cleaning practices could be detrimental to household health, particularly as pythons are often located in or beside residence.
Social capital	New social networks developed to share farming experiences.	
Physical capital	Farming enables households to meet basic needs such as housing and energy.	
Financial capital	Farming provides reliable income to support households and build assets. Improves financial resilience.	Several farmers required loans to start or expand their business. Farming has not ensured financial independence for many small farmers.
Natural capital	Captive breeding has largely eliminated reliance on wild python stocks and habitats.	Potentially reduced incentive to manage and conserve wild python resources.

Source: ITC household survey, 2015

1.3.   Python farming as a livelihood strategy

Households participated in python farming for 1 to 30 years, with the average household farming pythons for 11 years. Most of the farms also combined python farming with other wildlife farming activities. Python trade participants come from diverse backgrounds and have entered the business for various reasons. Many of the farmers that had been in the business for several decades, had switched between wildlife products according to market trends. In recent decades, returns for other wildlife – most notably crocodiles – has declined substantially and prompted an expansion of python farming activities. Three-quarters of farmers believed there were more farmers now than five years ago.

The motivations for pursuing python farming as a livelihood strategy were diverse. Many saw it as a good business opportunity, saying the returns were better than other livelihood activities including rice or pig farming, or working in a factory. Several farmers began as a hobby, alongside other activities, but have since shifted towards pythons as their main livelihood activity. Some older farmers saw python farming as a suitable, low-effort activity to help fund their retirement.

Regardless of their reasons for entering the trade, all farmers indicated that python farming had contributed positively to their livelihood outcomes. Most believed they would still be farming in 10 years and also hoped that their children would enter the trade. The discussions with python farmers revealed many advantages of python farming as a livelihood strategy (see Box 2).

Box 2.   Advantages of python farming as a livelihood strategy

- requires little time / effort
- easy / limited new skills required
- low investment in equipment / low start-up costs
- good returns relative to other livelihood activities
- stable returns relative to other livelihood activities
- can be done at home
- low barriers to entry
- work can be shared among household members
- helps farmers to diversify income sources

1.3.1.   Importance of python farming activities

For most households interviewed, python farming contributes the majority of their income, although many (78%) also receive income from other livelihood activities (see Figure 6). These additional livelihood strategies varied among regions.

- In Ho Chi Minh City, four python farmers had other wildlife businesses, including for turtles, crocodiles, fish, eels, monitor lizards, bamboo rats and porcupines. Eight farmers had off-farm income from other businesses, such as restaurants, carpentry, painting or manufacturing.

- In An Giang, nine managers were involved in farming rice, or other wildlife (including turtles, water snakes and crocodiles). Some farmers earned additional income trading fish, vegetables, coffee or rice. Several poorer farmers also took on casual labouring jobs to provide additional household income.

  In Ca Mau, rice and shrimp farming were common among python farmers with diversified incomes. Ca Mau province is the largest shrimp producer in Viet Nam. Three farmers also had small-scale pig farms.

Figure 6.   Livelihood strategies of python trade participants in Viet Nam
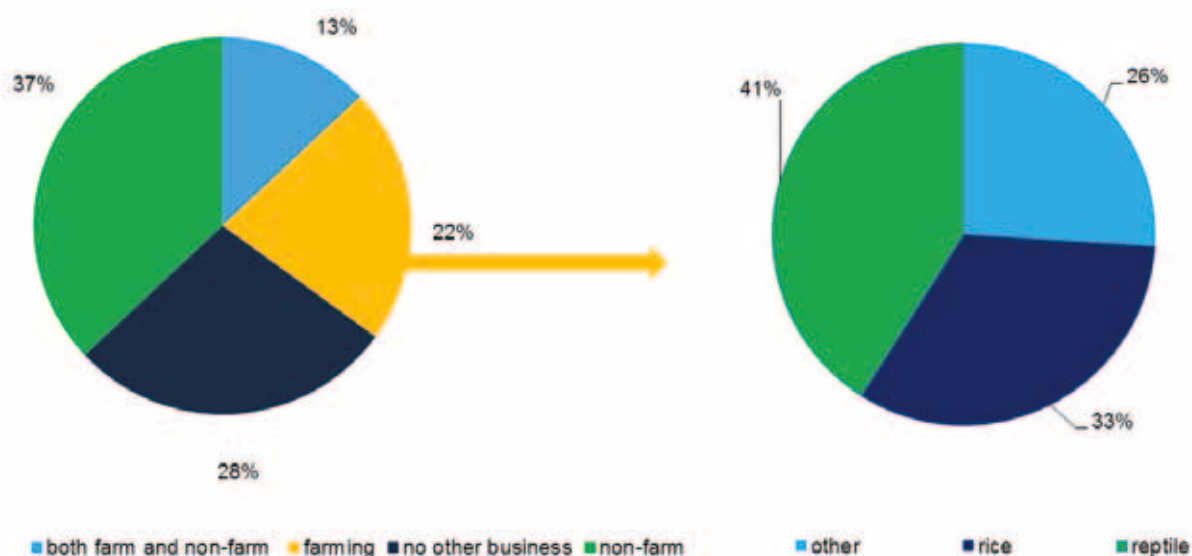
Source: ITC household survey, 2015

Table 6.   Additional income sources among python farm managers

	Ho Chi Minh City	An Giang	Ca Mau	Total
No other income	**3**	**3**	**7**	**13 (22%)**
Other farming income	**4**	**9**	**9**	**22 (37%)**
Rice	0	5	7	
Wildlife/Animals	4	4	6	
Non-farm income	**8**	**11**	**5**	**25 (42%)**
Own business	8	6	5	
Labourer/Worker	0	5	0	

*Note that subtotals may not add where farmers are involved in multiple business activities
Source: ITC household survey, 2015

Very few farmers received remittances from family members (6%) or government support (3.4%), despite some farmers having very low incomes.

1.3.2.   Diversity in python farming activities

There are four main types of python trade participants: breeders, processors, satellite farmers and farm employees. Some python farmers also participated as middlemen, trading hatchlings or adult pythons between satellite farms and slaughterhouses. The livelihood activities and outcomes of these groups varied significantly, particularly as they ranged from small businesses earning supplementary income to very large enterprises with several employees. For example, while financial data collected were mostly incomplete, and based solely on farmers' recollection, reported income from python farming in 2013 ranged from $140 to more than $100,000.

To provide more insight into the livelihood strategies and outcomes of trade participants, the following section profiles five 'typical' trade participants: a large breeder, a small breeder, a large processor, a small satellite farm and an employee. The profiles were generated by averaging data collected from respondents in each group, as well as through qualitative insights gained during household interviews.

Breeding farmers

Most of the households surveyed (43 out of 59) were breeding farmers. The diversity in breeding farms was significant, with farms hosting between 3 and 4,000 pythons and with 1 to 400 females on eggs at the time of survey producing an estimated 50 to 10,000 hatchlings a year. Most of the larger farmers were also processors, though some were specialized breeders whose income came primarily from selling large numbers of hatchlings to satellite farmers.

Reported clutch size varied between 20 and 60 eggs per female, with a success rate of 60% to 100%. Most farmers (76%) sold at least a share of their hatchlings to satellite farms, while the remainder bred pythons to raise themselves. Twelve of the breeders also purchased additional hatchlings from other breeders to immediately on-sell at a profit of $0.50 per head.

Adult pythons were generally sold after 12 months at 6–10 kg (with the exception of those kept by farmers who were also processors). Some farmers were raising larger 30–40 kg Burmese pythons for the Chinese market. Most breeders fed pythons a mixed diet including rats and chickens (all regions), rats and ducks (in Ca Mau) or rats and pigs/pig legs (Ho Chi Minh City), according to price and local availability. Only three breeders fed pythons a diet of only rats.

Breeders with more than a few hundred pythons typically had staff. Those surveyed had between 1 and 10 staff members and paid a monthly salary of 2.5 million VND to 7 million VND ($119 to $333). The average monthly salary paid was 4 million VND ($190).

Profiles for a typical large breeding farmer (not involved in slaughtering) and a typical small breeding farmer were estimated to improve understanding of the income associated with breeding pythons.

The large breeder was assumed to hold 50 females, each with an estimated 40-egg clutch and yielding 32 hatchlings (assuming an 80% survival rate [31]). The breeder is assumed to sell 1,000 hatchlings and keep the remaining 600 to raise and sell as adults. Expenses are assumed to include feed of rats and chickens, two full-time staff and maintenance. Such a farmer could earn around $34,000 a year (see Table 7).

The small breeder was assumed to hold two females, each also yielding 32 hatchlings. The hatchlings were all raised for sale as adults. Expenses included feed of rats and chickens, and maintenance. Such a farmer could earn an estimated $2,805 a year (see Table 8).

Table 7.   'Typical' large breeding farmer income statement

Sales	Total ($)
Hatchling sales (1,000 pythons x $15.50 per head)	15,500
Mature python sales (600 pythons x 6 kg x $15 per kg)	54,000
Expenses	**Total ($)**
Feed (rats and chickens/pigs/ducks) (600 pythons x 26 kg x $1.40 per kg) (50 large pythons x 52 kg x $1.40 per kg)	25,480
Staff (2 staff x $190 per month x 12 months)	4,560
Maintenance (electricity, cages, medicine, other) (400 per month x 12 months)	4,800
NET INCOME	34,660

*Very little data could be collected on maintenance costs given that farmers did not keep records and some maintenance costs were included with general household costs (e.g. electricity). These data are an approximation.
Source: ITC household survey, 2015

Table 8.   'Typical' small breeding farmer income statement

Sales	Total ($)
Mature python sales (64 pythons x 6 kg x $15 per kg)	5,760
Expenses	**Total ($)**
Feed (rats and chickens/pigs/ducks) (64 pythons x 26 kg x $1.40 per kg) (2 large pythons x 52 kg x $1.40 per kg)	2,475
Maintenance (electricity, cages, medicine, other) (40 per month x 12 months)	480
NET INCOME	2,805

*Very little data could be collected on maintenance costs given that farmers did not keep records and some maintenance costs were included with general household costs (e.g. electricity). These data are an approximation.
Source: ITC household survey, 2015

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[31] see Natusch and Lyons, 2013.

Processing farmers

There were 10 python farmers among the households surveyed who participated in slaughter and processing of pythons for their skins (All but one of these farmers were also breeding pythons and selling hatchlings to satellite farmers for later repurchase). Each farm processed between 300 and 12,000 skins a year. Skins were reportedly 2.65–3 metres long and sold for $17 to $29 per metre.

Most farmers sold their skins to exporters, although a few had contracts directly with overseas buyers in China, Japan or Europe. The meat, fat and gall bladders collected as by-products of python processing were sold to the domestic market for food, fish food and medicine.

Nine out of 10 processing farms had staff or family workers (between 1 and 10 staff members), each receiving an average monthly salary of $172. In general, large processing farms were well maintained with good-quality cages and clean facilities.

A typical large processing farm was assumed to hold 150 parent stocks, including 95 successfully fertilized females, producing an estimated 3,000 hatchlings a year. The farm is assumed to sell 2,000 hatchlings and raise 1,000 hatchlings. After one year, the farm is assumed to repurchase 2,000 hatchlings for processing and to sell 3,000 skins. The farm employs four staff on an average salary. Monthly maintenance costs are estimated at $1,000 (around $100 for electricity and $900 for maintenance).[32] Skins are sold at an average 2.85 metres for $27 a metre, meat and fat at an average $2 per kg, and gall bladders at $1 apiece. Such a farmer could earn about $40,410 a year.

Table 9. 'Typical' large processing farm income statement

Sales	Total ($)
Hatchling sales (2,000 pythons x $15.50 per head)	31,000
Skin sales (3,000 skins x 2.85 metre x $27 per metre)	230,850
Meat and fat sales (3,000 pythons x 4 kg x $2 per kg)	24,000
Gall bladder sales (3,000 gall bladders x $1 per piece)	3,000
Total Sales	**288,850 p.a.**
Expenses	**Total ($)**
Mature python purchases (2,000 large pythons x 6 kg x $15 per kg)	180,000
Feed (rats and chickens/pigs/ducks) (150 large pythons x 52 kg x $1.40 per kg) (1,000 hatchlings x 26 kg x $1.40 per kg)	47,320
Staff (4 staff x $190 per month x 12 months)	9,120
Maintenance (electricity, cages, medicine, other) (1,000 per month x 12 months)	12,000
Total Expenses	**248,440 p.a.**
NET INCOME	**40,410 p.a.**

Source: ITC household survey, 2015

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[32] While all farmers could estimate electricity costs, only one farmer could estimate maintenance costs. As such, this figure could be over- or underestimated.

Satellite farmers

Despite a lack of official records, there are estimated to be thousands of satellite python farmers in Viet Nam. The majority of these are very small-scale, and most are poor. In Ho Chi Minh City, survey participants knew of up to 100 satellite farmers in the surrounding area, compared to several hundred in An Giang. In Ca Mau, respondents indicated there were thousands of farms in the surrounding region. In some parts of the province, such as Thoi Binh, farmers reported that 80% of households had at least one python.

In this study, 14 satellite farmers were surveyed, each holding 10–90 pythons. Most satellite farmers were relatively new to the industry and had been farming for less than five years. The main approach to satellite farming was to buy python hatchlings less than a week old and raise them for about 12 months, until they were 6–8 kg. Pythons were then sold back to middlemen or larger processing farms. The main cost in satellite farming is for feed. While feed composition varied between farmers, all but two included rats in the feed mix. One farm instead relied on chicks sourced from the local market, while the other used ducks of its own, bred on-site. Most using rat feed supplemented this with chicken heads, which cost less. Feed was sourced from local markets, with the exception of five farmers who cut costs by catching their own rats.

Estimating the income profile for a typical satellite farmer with 30 pythons suggests an annual profit of $1,143 in 2013 (see Table 10). Given the need to support an average household of five members, most also had other livelihood activities, including rice farming or casual labouring jobs, among others. Satellite farmers commented on the importance of python farming in meeting household living costs such as food, fuel and education. However, the ability of satellite farming to improve financial security appears to rely on expanding the farm (in terms of both number of pythons and cages, and potentially by breeding).

Table 10. 'Typical' satellite farmer income statement

Sales	Total ($)
Mature python sales (30 pythons x 6 kg x $15 per kg)	2,700
Expenses	**Total ($)**
Hatchling purchase (30 pythons x $15.50 per head)	465
Feed (rats) (30 pythons x 26 kg feed x $1.40 per kg)	1,092
Net Income	**1,143**

*Other expenses including cage maintenance were reported to be negligible.
Source: ITC household survey, 2015

Farm employees

Most large python farms employed additional workers, unless sufficient family staff were available. A total of 17 farm employees were interviewed in this study, from 10 different large farms. These workers' activities varied, but could include feeding, cleaning, slaughtering and skinning pythons, and/or drying and stretching skins. Some also raised chicks for feed. Half of the employees had only been working on python farms for one year; the remainder had mostly been at the farm for two to four years.

Python farm employees worked eight hours a day, six days a week, and earned of $1,716 to $3,420 a year, plus full board. The average salary was $2,570. Employees said the job was stable, less physically demanding than other jobs (such as construction) and higher paying than positions in other industries (such as shrimp farming and factory work). Five of the farmers took the job immediately following secondary or high school.

2. Livelihood outcomes of trade participation

The python skin trade is economically important to thousands of households in Viet Nam. The outcomes of python farming differ widely between participants and include impact on income and wellbeing.

2.1. Contribution to income

The most obvious outcome of python farming for household livelihoods is the opportunity for employment and higher incomes. While data on net income from python farming could not be collected, data estimated based on average profiles for alternative farming activities suggest that typical farms and employees earn between $1,143 and $40,410 (see Table 11). The data indicate that the earning potential for python farmers is significant, but depends heavily on the capacity of farmers to invest in python stock and cages, and to develop the skills required for breeding and processing pythons.

Nevertheless, python farming has had a significant positive impact on the income and livelihood resilience of poor households. In Viet Nam, poor households are classified as those earning less than $19 per capita per month in rural areas, and $24 per capita per month in urban areas. For a household with five members, this equates to $1,140 a year in rural areas and $1,440 a year in urban areas.[33]

A typical satellite farmer raising 30 pythons (as profiled in the previous section) would just meet this poverty threshold. Small satellite farmers said python farming had enabled them to afford food and living expenses.

For most survey participants, python farming has offered an opportunity to diversify household income and thereby build livelihood resilience. The returns from python farming are higher than those from many other available livelihood strategies, particularly among poorer households in rural areas that have traditionally relied on small-scale agriculture and casual manual work. Most farmers earned the bulk of their income from python farming, supplementing this with earnings from other farming and business activities. One advantage of python farming is that it takes little time and can be part of a diversified livelihood strategy, thereby contributing to greater household resilience.

According to the households interviewed, the income associated with python farming has increased in recent years. Many new households have entered the trade after recognizing the good returns achieved by friends, neighbours and family members participating in the trade.

Table 11. Estimated household income by type of farm[34]

	Approximate average annual income from python farming ($)	Number of households surveyed
Satellite farmer	1,143	14
Small breeder	2,805	18
Large breeder	34,660	17
Large processor	40,410	10
Employee	2,570	17
Total respondents		**76**

Source: ITC household survey, 2015

2.2. Contribution to wellbeing

A major impact of python farming on wellbeing is through earnings, which contribute to cash flow and food security and reduce household vulnerability. Vietnamese households spend more than half of their income

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[33] VGP, 2015

[34] In 2014, the gross national income per capita in Viet Nam was $1,890 (World Bank, 2013).

on food – recent estimates suggest spending on food may be 47% in urban areas and up to 58% in rural areas.[35]

Yet most farmers also indicated that python farming had a positive impact on social, community and household wellbeing. A high proportion of households (74%) could not name anything they would change in their community. The vast majority were happy with python farming and would like to be farming in 10 years (89%) and for their children to farm pythons (77%). Even more convincingly, 96% would recommend python farming to their friends as a good livelihood strategy, mostly because it is 'easy' and 'profitable' and provides stable returns.

Despite clear variations in income and living standards, most python farmers (59%) perceived themselves to be of average wealth. Another 24% considered themselves to be of above-average wealth with only 17% seeing themselves as poor or very poor. Most farm employees (76%) also believed themselves to be of average wealth.

Table 12.   Perceptions of own household wealth

Managers	Ho Chi Minh City	An Giang	Ca Mau	Total
1 (poor or very poor)	1	4	1	6 (10%)
2 (below average)	1	2	1	4 (7%)
3 (average)	10	13	12	35 (59%)
4 (above average)	3	4	7	14 (24%)
5 (wealthy)	0	0	0	0 (0%)
Total managers	**15**	**23**	**21**	**59**
Employees	**Ho Chi Minh City**	**An Giang**	**Ca Mau**	**Total**
1 (poor or very poor)	0	0	1	1 (6%)
2 (below average)	2	0	0	2 (12%)
3 (average)	7	3	3	13 (76%)
4 (above average)	1	0	0	1 (6%)
5 (wealthy)	0	0	0	0
Total employees	**15**	**23**	**21**	**17**

Source: ITC household survey, 2015

While relatively few python farms were managed solely by females, women were often involved in breeding and raising pythons as part of the family business. Given that python farms are typically based at home, farming can offer opportunities for women to learn new skills and earn money alongside household responsibilities. There are likely to be significant livelihood benefits from enhancing the participation of women in python farming, particularly as women are more likely to spend income on food and household essentials.[36]

Keeping and raising pythons in Viet Nam is a family affair.
© Patrick Aust

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[35] GSO, 2014

[36] IFPRI, 2005.

2.3. Contribution to conservation

The model of captive breeding of pythons for their skins has significantly reduced the conservation risks of the trade in pythons from Viet Nam.

As a result of widespread success with captive breeding, Viet Nam is no longer dependent on depleted wild stocks.

However, captive breeding of pythons does not contribute directly to conservation of wild populations and may even reduced incentives for conserving wild python resources. Because production is based on captive breeding and not on sourcing from the wild, there are no economic incentives for Viet Nam to protect wild pythons and their habitats. This is in contrast with other countries, such as Indonesia and Malaysia, which rely on a sustainable supply of pythons from wild sources to provide income and other livelihood benefits for households participating in the trade.

3. Challenges facing python farmers

Python farmers face various challenges related to their business operations, their trade participation and their broader community and environment. Understanding these challenges can assist in improving python production and trade, and thus livelihood resilience.

3.1. Operational challenges

Farmers identified several areas in which they felt training would help them improve their business. Their most common concerns pertained to disease, hygiene and temperature control (see Table 13). Many farmers had lost breeding females or eggs in the previous 12 months as a result of fluctuations in ambient temperatures. The most common disease was respiratory infection. While larger farms are often set up to allow pythons direct access to sunlight for some period each day, such as by opening the facility roof[37], this is not feasible for all smaller operations. Similarly, while larger farms supplemented python feed with medicine, smaller farms did not have the knowledge or skills to prevent or treat disease.

Most small farmers were interested in expanding their operations and improving their productivity. Many were keen to learn how to breed pythons in order to increase income potential. Others would appreciate advice on feed management and python growth to improve production efficiency. Most farmers (63%) would like to purchase additional cages and pythons to expand their business if they had the financial capacity to do so.

Table 13. Training needs identified by respondents

Managers	Ho Chi Minh City	An Giang	Ca Mau	Total
Disease / hygiene / temperature control	9	11	10	30
Breeding	2	4	3	9
Feed management	1	3	0	4
Other	4	4	2	10
Unsure/Nothing	6	4	4	14

*Some farmers identified more than one need
Source: ITC household survey, 2015

3.2. Market challenges

Farmers had little understanding of the broader market and trade in which they operated. For example, 51% were unsure whether overseas demand had increased or decreased. With the exception of large

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[37] Natusch and Lyons, 2014

farms, most were uncertain about the markets for which they were producing. This lack of market knowledge creates vulnerability among farmers, as they have little capacity to plan or respond to shifts in the quality or quantity of product demanded.

When asked a hypothetical question about the potential impact of a European ban on python skins, most said they would continue farming. Although 10% thought they would scale back production, 33% stated they would maintain production for other markets in Asia and 27% believed there would be no change to their production 'as long as there are customers'. Only 13% said they would leave the industry. Even large exporters and processors indicated a high level of confidence in the Asian market, despite potentially significant economic impacts associated with reduced market access.

Concerns about a hypothetical domestic ban were greater, with 33% unsure about alternative livelihood strategies they could pursue. Most suggested that they would diversify into other wildlife farming, return to farming rice or try to find employment elsewhere – though the livelihood outcomes associated with many of these activities are reportedly much lower than python breeding. The structural adjustment costs of shifting business activities are also likely to be significant.

Table 14.   Response to hypothetical policy changes

	European ban (n=52)	Domestic ban (n=55)
No change	27%	2%
Sell to other markets	33%	0%
Reduce production	10%	0%
Leave the industry	13%	22%
Other farming	0%	44%
Unsure	17%	33%

*Some farmers identified more than one need
Source: ITC household survey, 2015

3.3. Social and environmental challenges

Farmers raised few concerns about their community, with 74% saying they would change nothing. In Ca Mau, 10% of respondents said poor roads hindered their livelihood, while 10% complained about high electricity prices. In An Giang, respondents highlighted the need for better roads (17%) and improved water supplies (9%). One farmer in Ho Chi Minh City was concerned about the environment.

Chapter 4   Implications for capacity-building

Python farming and trade offer a means of employment, income diversification and poverty alleviation in rural households in Viet Nam. This study has shown that the benefits of farming pythons as a livelihood strategy are overwhelmingly positive. In terms of poverty reduction, the satellite farming model has proven particularly effective in engaging poor households in rural areas and offering reliable earnings, an opportunity for income diversification and improved wellbeing. Given the low barriers to entry – limited technical skills, physical space and upfront investment are needed – the model has engaged thousands of households in the Mekong Delta region.

There are areas where industry, government and development agencies could enhance the benefits of the trade in pythons for livelihoods and strengthen its contribution to socio-economic development and poverty reduction:

- **Improve farm-management practices:** Farmers could benefit from guidelines and training on farm-management practices, including feeding practices, temperature control, stocking rates, cleanliness and hygiene.

- **Improve capacity of small farms to breed:** The income-earning potential of farms is heavily influenced by their capacity to breed, and thereby dramatically increase operating scale. Sharing best practices on reproduction could help improve livelihood outcomes among small farmers, but also demands a higher upfront investment.

- **Improve market information:** Few farmers were aware of trends in the quantity and quality of skins demanded by global markets. Farmers could benefit from regular trade data as well as guidelines for producing high-quality skins for international markets.

Towards the design of effective capacity-building programmes

In general, python farmers are highly innovative and eager to learn new techniques to improve their business and livelihoods. Seven out of 10 respondents had adopted new farming practices in the past five years. This suggests there is likely to be strong uptake of useful information that can expand their productivity.

Online or written training programmes probably will not reach the large number of farmers who do not use the Internet or who have limited literacy skills. However, python farmers are also well-connected and often meet with peers to discuss python farming. This connectedness offers a route for sharing information through face-to-face training programmes.

Many python farmers are too small to be registered with government authorities, and this is unlikely to change anytime in the short-term. Instead, establishing regional farmer groups or associations could improve access to new farming practices and market information, as well as offer a collective voice for industry to ensure that small farmers are disadvantaged from changes in business requirements or changes in government policy.

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