

# Proceedings of the International Cavies Symposium

*Yaoundé, Cameroon, 6-8 July 2016*



biosciences  
eastern and central africa





*Symposium participants Ursule Mekongo from the Cameroon association of cavy farmers and Roberto Moncayo-Galliani, the largest cavy producer in Ecuador*

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Nairobi, 10 August 2017

Biosciences eastern and central Africa-International Livestock  
Research Institute (BecA-ILRI) Hub

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*Group photo of all symposium participants (photo: University of Dschang)*



*Symposium participant Angel Reyna from Bolivia meets the Cameroon Minister of Livestock, Fisheries and Animal Industries, HE Dr. Taïga (photo: BecA-ILRI Hub/ Ethel Makila)*

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# Foreword

The Biosciences eastern and central Africa-International Livestock Research Institute (Beca-ILRI) Hub, in partnership with the Australian Commonwealth Science and Industrial Research Organisation (CSIRO), led the first comprehensive project on domestic cavy in Africa from 2011 to 2014: 'Harnessing husbandry of domestic cavy for alternative and rapid access to food and income in Cameroon and the eastern Democratic Republic of the Congo'. This project combined research and development (R&D) partners from Cameroon and the eastern Democratic Republic of Congo (DRC), and had particular emphasis on capacity building and awareness creation, besides assessing parameters of animal genetics and livelihoods of rural people.

In follow-up of this project, a number of experts on cavy from South America and sub-Saharan Africa (SSA) have come together in Yaoundé in July 2016 to discuss the way forward for including cavy in the livestock strategy in Cameroon in particular and Africa in general. The University of Dschang and other partners in Cameroon and from DRC have already demonstrated the importance of cavy. The new initiative, therefore, aims further to look at the genetics of the species and create increased opportunities for value chain development. The support by the Ministry of Livestock Fisheries and Animal Industries for this symposium and Cameroonian research will provide opportunity to demonstrate the importance of the research sector in development.

We were privileged to host several eminent experts and authorities in the area of cavy R&D. In order to tap the accumulated knowledge available in South America and create South-South cooperation, a strong group of South American experts were invited. From Peru the delegation was led by Lilia Chauca, who has 42 years of experience in cavy research. From Ecuador, the group was led by Roberto Moncayo-Galliani who is the biggest cavy producer in the world. From Bolivia, we had Eduardo Lopez and Angel Reyna who have pushed the Bolivian government to adopt cavy as a protein source for schools. Also, the former ILRI director general, Carlos Sere, and a representative of the Australian government, Bruce Pengelly, participated. With all these partners assembled, we can assist African farmers to improve their production and utilisation of cavy for income generation and nutrition security.

It was an honour and privilege for me as the Director of the Beca-ILRI Hub to patronize this symposium and foster subsequent emerging initiatives.

*Appolinaire Djikeng*

# Executive summary

For the first time, representatives from South America (Bolivia, Ecuador, Peru) and sub-Saharan Africa (SSA; Benin, Cameroon, Côte d'Ivoire, DR Congo, Kenya, Tanzania) met in an International Symposium on Cavies in July 2016 in Yaoundé, Cameroon. To foster South-South partnership development and knowledge exchange, the symposium provided a forum for various stakeholders from research, government, NGOs and farmer associations. The symposium used modern workshop formats, such as 'Poster bus stops' and 'World Café', to stimulate maximum interaction among the diverse participants for future networking.

The symposium succeeded the first comprehensive project on domestic cavies in Africa (2011-2014) led by the Biosciences eastern and central Africa-International Livestock Research Institute (BeCA-ILRI) Hub, in partnership with the Australian CSIRO (Commonwealth Scientific and Industrial Research Organisation) and supported by DFAT (Department of Foreign Affairs and Trade, Australia). This project combined research and development (R&D) partners from Cameroon and the eastern Democratic Republic of Congo (DRC), and had particular emphasis on capacity building and awareness creation, besides assessing parameters of animal genetics and livelihoods of rural people. Cavy meat has been identified as an alternative animal-source-protein accessible to poor and vulnerable people in SSA. Aiming to increase cavy productivity, consumption and market opportunities for improved livelihoods would contribute to several Sustainable Development Goals (SDG). It is, thus, imperative to better understand current and potential roles of cavies and deploy the animal for nutrition security and poverty reduction to make the most use of them by expediting learning from similar South American experiences.

In South America, where cavies have a centuries-old tradition, striking advances have been achieved in cavy culture over the past decades. Cavy culture is understood as raising, producing and utilizing domestic cavies as a non-conventional livestock species for meat, manure and income generation. To learn from each other in South-South cooperation, potential areas of interaction identified were not only technical advances in production but also approaches applied for cavy meat promotion or organizing value chain actors. Production-, marketing- and training-related field visits conducted with the South-American visitors were very important to give them an imagination about some aspects of present cavy culture in Cameroon.

Abstracts on five oral presentations and nine posters are providing continent- and country-specific information on cavy culture in addition to considering technical and socio-economic opportunities and methodological approaches. Discussions from a 'World Café' on six themes (i.e. animal health, managing production, human nutrition, marketing and consumption, consumer behaviour, and policy and advocacy) are briefly summarized thereafter. Before concluding on perspectives, the framing of a future cavy project with South-South cooperation is thoughtfully outlined by developing a vision for a thriving cavy industry and home consumption. The main pillars of such a program will be capacity development and knowledge management/awareness creation to break the 'vicious circle of neglect' of cavy culture in Africa.

One of the biggest challenges recognized is that institutions overlook cavies as they are small, non-conventional animals. But various advantages of cavy culture can assist in poverty alleviation and livelihood improvement, for example:



- Abundant technical knowledge is available on cavy production (mostly in South America) that needs to be targeted to African conditions and packaged in simple messages using modern tools. Moreover, some applicable technical research results already exist from SSA, especially Cameroon, which has been leading in cavy research on the continent.
- Cavies offer a healthy, white meat with overall high contents in amino acids and containing 'good' fat (omega 3-poly-unsaturated fatty acids), providing a link to child development and SDG #2 on reducing malnutrition, as a valuable component in nutrition-sensitive agriculture.
- There is demand for cavy meat and almost no cultural or religious barriers seem to exist.
- Cavy production and marketing serves gender equality and women empowerment.

Despite the absence of a dedicated cavy project, participants agreed that immediate action should be taken to advance the collaboration, such as to:

- Form a cavy R&D network within and across countries to exchange information and detect opportunities, e.g. soon establish a structure for communication, using ICT tools – BecA.
- Pursue awareness creation in multiple ways as opportunities arise – all participants.
- Actively engage in fund raising with a variety of possible donors – all participants.
- Explore opportunities for South-South cooperation, especially by tapping an emerging PROCASUR-project funded by IFAD on cavy production and marketing in North Peru with its model of 'learning territory' for technology diffusion – BecA, PROCASUR.
- Continue to build capacity by emphasizing cavies as one of the African livestock species in training and research conducted by BecA fellows – BecA.
- Prepare peer-reviewed publications from existing results to pursue establishing cavy culture in science – all researchers.
- Explore potentially interested local projects and organizations and existing facilities to take up portions of the R&D agenda to keep going the long-term engagement – all participants.

African cavy culture has been dormant for decades if not centuries, trapped in a vicious circle of neglect. Continuing this vicious circle would cause yet another missed opportunity for improving livelihoods of the poor. The International Cavies Symposium has revealed a wealth of chances for African cavy culture to evolve by piggybacking on the impressive advances achieved in South America over the past decades. It appears high time that this transcontinental connection has been established and, hopefully, will develop into a vibrant multilateral partnership.

The support by DFAT-Australia, IDRC-Canada, PROCASUR, the Cameroonian Ministry of Livestock Fisheries and Animal Industries, as well as the University of Dschang for funding and co-organizing this International Cavies Symposium in Yaoundé in July 2016 is gratefully acknowledged.

# Introduction

## Cavies for food and nutrition security in Africa

Food and nutrition security and, particularly, the quantity and quality of animal-source foods, poses a real challenge in most parts of Africa. General food supply remains low compared to the increasing demand of growing populations and rising urbanization all over sub-Saharan Africa (SSA). Regular supply of small quantities of animal protein has been shown to be crucial for adequate physical and cognitive development of children. To enhance poverty alleviation strategies in rural zones of Cameroon and the Democratic Republic of Congo (DRC), alternative small livestock species, particularly domestic cavies, are increasingly receiving greater attention through the creation of pilot programs in the National Agricultural Research Systems (NARS).

A partnership between the Biosciences eastern and central Africa-International Livestock Research Institute (BeCA-ILRI) Hub and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) carried out a project on cavies between August 2011 and June 2015, titled 'Domestic Cavy: Improving husbandry and forage for alternative and rapid access to food and income for women and children in Cameroon and the eastern Democratic Republic of the Congo'.



*Domestic cavies in a household kitchen in Cameroon (photo: Felix Meutchieye/University of Dschang)*

Project results showed that there is potential for livelihood improvement among smallholders through cavy-rearing: increased consumption can address low protein intake, manure can contribute to soil fertility, and sales can improve incomes in the target communities. It was further shown that cavy-keeping is dominated by women (> 60%) and youth (>12%) in both countries. Estimates suggest that at least 200,000 and 100,000 households keep cavies in Cameroon and Sud-Kivu province of DRC respectively. In DRC, cavies exist at the base of the 'livestock ladder' and, as such, have potential as a stepping-stone for smallholder farmers to generate income to build assets and to eventually own and manage other large livestock animals. Because the farming of chicken is more challenging in the humid tropics, the potential for cavies as an entry point for livestock farming is greater, while also favouring participation by women and youths. Some commercial farms in DRC are now operational and cavy trading is developing in both Cameroon and eastern DRC.

**BOX 1:** Cavy culture is understood as raising, production and utilization of domestic cavies as a non-conventional livestock species for meat, manure and income generation.

The domestic cavy or guinea pig, also known as 'cuy' or 'cobayo' in South America, was domesticated in pre-Columbian times and is a well-known and highly appreciated source of meat in Peru, Ecuador, Bolivia and southern Colombia. There is an estimated 43 million domestic cavies in this region, where they are an important source of food as well as having cultural-spiritual value. Over 50 years of research on cavies led by Peru's national institute of agricultural innovation (INIA) yielded improved breeds that are larger and either fast-growing or more prolific, which are widely consumed locally, in addition to being used for some export. Both improved breeds and enhanced animal husbandry systems have also been reported from other Andean countries in South America, which could provide many valuable lessons for Africa. Due to language barriers, the rich knowledge generated in South America has only incipiently been accessed in Africa. But generally, domestic cavies have been neglected as a small livestock species in Africa; they are not even included in any African national livestock census except in Tanzania. The likely underestimation of their value is exacerbated because the lack of knowledge on cavy culture in Africa further reduces the likelihood of their inclusion in R&D initiatives, thus, creating a 'vicious circle of neglect' (Figure 1).



*Figure 1. The vicious circle of neglect in African cavy culture (by BL Maass)*

## Purpose and objectives of the symposium

A symposium was held from 3 to 8 July 2016 in Yaoundé, Cameroon from where the previous cavy project that was part of the BecA/ILRI Hub–CSIRO partnership was coordinated. About 40 participants from 13 countries in SSA, from international bodies (FAO, IFAD, ILRI, and Bioversity International) and South American organizations (e.g. PROCASUR, INIA, Universidad Nacional Agraria La Molina – Peru; World Vision – Bolivia; and ESPE – Ecuador, among others) attended the symposium. A local committee was spearheaded by the University of Dschang, the Ministry of Livestock, Fisheries and Animal Industries, and other stakeholders in Cameroon to ensure that local logistics was in place with the BecA-ILRI Hub backstopping this team.

The symposium provided a forum for exchange of information and networking among the various stakeholders including researchers, NGOs, farmer associations and, particularly, for South-South knowledge exchange. Specific objectives included the following:

- To exchange knowledge within SSA as well as between Africa and South America (South-South exchange), where cavy value chains are developed at different levels of production and commercialization intensity, and production is well integrated in communities.
- To create awareness on the importance of cavies for rural communities among key stakeholders, including potential funding agencies leading to mobilizing resources for R&D activities on alternative livestock species.
- To create opportunities for further investment by national and local governments, as well as development partners.

## Symposium format and expected outputs

To help South American participants familiarize with an African context and its cavy culture, pre-symposium tours were organized for them together with a few key partners from Africa to visit a market in Yaoundé (Mvog-Ada), farmer groups in the area of Nkolmetet division, Southeast of Yaoundé, and a technical training school (EPAB) at Binguela, Southwest of Yaoundé. The symposium aimed at maximum interaction of participants in order to start networking immediately; therefore, only few contributions were given as oral presentations. Other formats were ‘poster bus-stops’, where individual posters on cavy culture in different countries were presented to a diverse group of participants that discussed the information provided, before moving to the next country poster. For both oral presentations and posters, participants prepared abstracts that are compiled in these proceedings, while all visual presentations are available at [ONLINESITE](#). In a ‘World Café’, six mixed groups of participants added details to main issues identified from previous discussions, i.e. animal health, managing production, human nutrition, marketing and consumption, consumer behaviour, and policy and advocacy. Group findings are briefly summarized. While the World Café had six rapporteurs, Barbara Massler from PROCASUR acted as facilitator during most of the sessions. After the first day, a cavy fair provided the space for exposing materials, products and information pieces related to cavies to the audience. The symposium dinner on the second day offered participants a variety of Cameroonian cavy dishes.



*(l) Visiting the cavy unit at Ecole Pratique d'Agriculture de Binguela (EPAB) in Binguela  
(r) Discussion by African, South American and Australian participants during the cavy fair; typical transport baskets in the foreground (photos: BL Maass)*

Expected outputs of the symposium were:

- Strengthening existing cavy R&D activities in national livestock development programs;
- Developing South-South networks to incorporate lessons learned on cavy farming from South America into the African context;
- Developing new partnerships and initiatives on alternative livestock production systems;
- Generating increased interest on supporting cavy R&D activities; and
- Mobilizing resources to support additional cavy research for development activities.

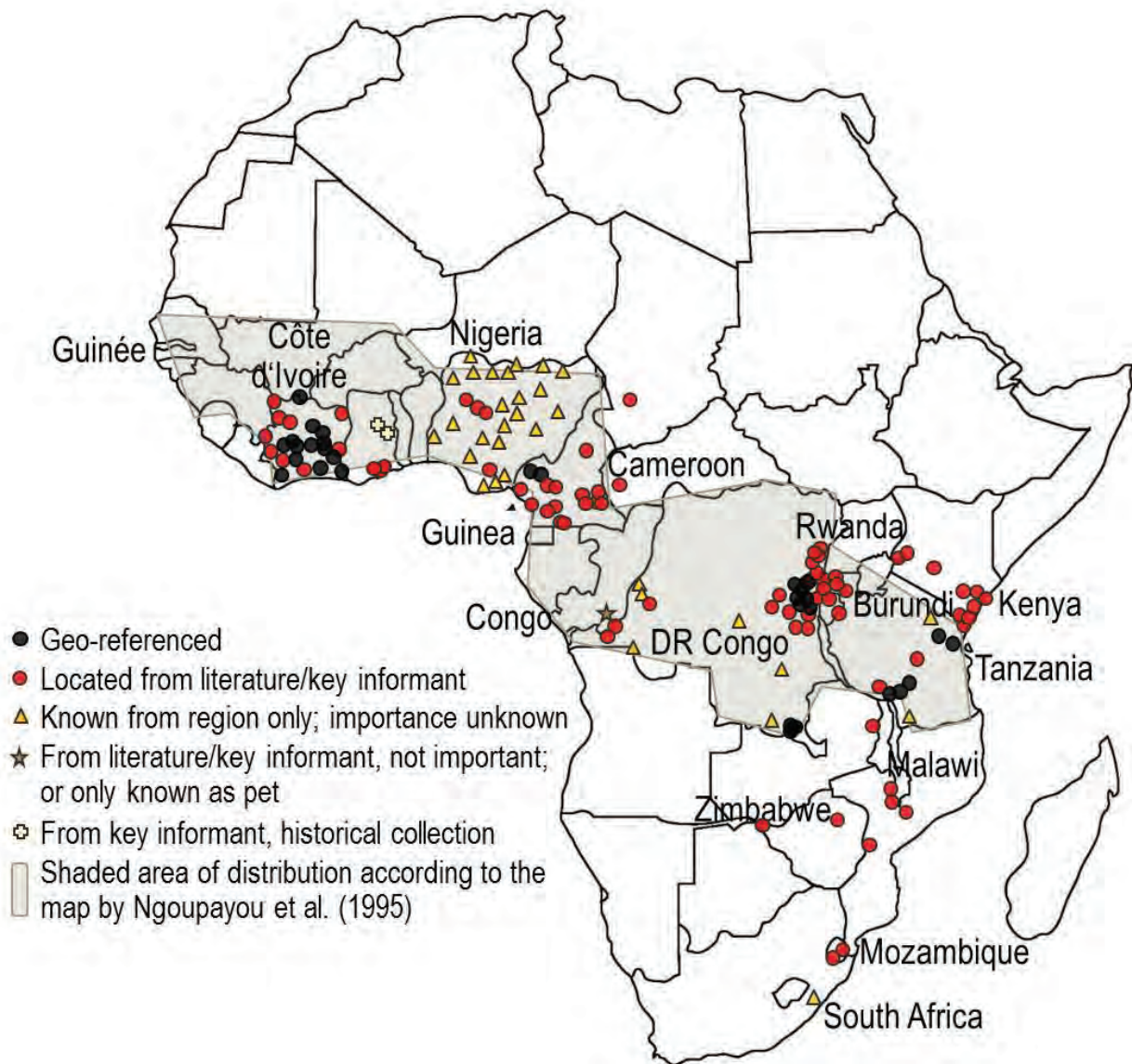
In addition to PROCASUR, we gratefully acknowledge the support by DFAT-Australia, IDRC-Canada, the Cameroonian Ministry of Livestock Fisheries and Animal Industries, as well as the University of Dschang for funding and co-organizing this International Cavy Symposium in Yaoundé in July 2016.



*South American symposium participants get insights on local cavy farming practices in Nkolmetet (photo: BL Maass)*



*A group visiting the Bolivian “poster bus-stop” presented by Eduardo López-Rosse (photo: BL Maass)*



Known cavy distribution in Africa (figure: BL Maass et al. 2014, unpublished; reference to: Ngoupayou JN, Kouonmenioc J, Tagny JF, Cicogna M, Castroville C, Rigoni M, Hardouin J. 1995. Possibilités de développement de l'élevage du cobaye en Afrique subsaharienne: le cas du Cameroun. *World Animal Review (FAO/AGA)* 83 (2):21-28; URL: <http://www.fao.org/ag/aga/agap/frg/feedback/war/v6200b/v6200b08.htm>

# Abstracts from oral [O] and poster [P] presentations

## Cavies in Africa: Origins, distribution and roles [O]

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It has been proven that domestic cavies originated and have been domesticated millennia ago in South America. Yet, it is unknown, when they reached sub-Saharan Africa. The current paper highlights the origins and development of cavy culture in Africa. Based on literature review and resource people's interviews, the findings are that substantial numbers of cavies are currently distributed on a broad belt throughout SSA, from the western Atlantic to the eastern Indian Ocean. Little evidence exists concerning the routes through which they arrived in and spread all over tropical Africa. When comparing African with South American and European cavy genepools, high diversity was demonstrated. Cavies are mostly found in sub-humid and humid regions where they can play critical roles for nutrition, income generation and, through manure, smallholder integrated agricultural systems. Despite research started more than 20 years ago mostly in Cameroon, cavy culture is not yet considered in animal production mainstream as shown by various national and regional livestock censuses. Productivity is often low, hampered by high rates of inbreeding, and only few commercially oriented entrepreneurs have taken up cavy production. Yet, cavy production and consumption have no taboos. In some parts, though, a certain poverty image is attached to them, maybe due to large-scale distribution conducted by NGOs in conflict areas. Depicted like other non-conventional animal species, cavies could be a good starting point for sustainable food and nutrition security for rural and peri-urban households, in the great majority under the control of women and youth.

**Keywords:** Dissemination, genetic diversity, guinea pig, husbandry, non-conventional livestock, policies.



# Cavy culture in Cameroon: Production systems, diversity and richness [P]

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In order to assess existing cavy production systems of Cameroon western highlands and rain forest agro-ecological zones, a household baseline survey was carried out in a total of 500 households randomly chosen. It appears that cavy culture is a women (> 60%) and youth (>12%) driven livestock production system for both regions. The main motives are consumption (62%), income generation (32%) and manure (18%). The majority of actors are smallholders, more or less organized, with flock size varying from 3 to >500, with a mean of 16 per farm household. Average adult cavy live weight was 620 g ( $\pm 35$ ). The most common production system was 'kitchen free roaming', with only few caging. A total of 475 cavy biodata samples were collected to estimate the genetic variability using 13 microsatellite markers. Inbreeding was a real challenge in all study sites ( $F_{is} = 0.32852$ ). Cameroon's cavy populations demonstrated four putative subpopulations with a wide range of variation. These populations compared to DRC and Côte d'Ivoire sampled were relatively very distant. Genetic potential and breeding-related constraints were identified in all the zones investigated. Traits of importance from farmers' views were growth, adaptability and fecundity. There is need for a well-designed and comprehensive national cavy breeding program and increased capacity building of farmers to address mortality rates and health issues. Rapid improvements in production could be easily achieved with huge potential impacts through improved feeding and reproduction management. Promising results have been demonstrated using national and regional Cavy platforms, consisting of major local stakeholders (producers, traders, restaurants, NARS and media). The new concept called CAVYLAND has been developed to capture the dynamics in the Centre Region. The resulting awareness could be fostered towards a better utilization of non-conventional domestic livestock species to address food and nutrition security challenges in Cameroon.



*Typical cavy husbandry in the kitchen of a farm house in Nkolmetet, Cameroon (photo: BL Maass)*

**Key words:** Genetic diversity, guinea pig, livestock husbandry, smallholders, stakeholder platform.

# Cavy culture in Eastern DR Congo: Current situation and perspectives [P]

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Cavy-culture has shown potential to improve income and nutrition status of smallholder farmers in eastern Democratic Republic of Congo (DRC). During the previous cavy project (2011-2014), actors along the cavy value chain were organized in Innovation Platforms, whereby research on cavy breeding and improving cavy feeding was conducted in order to help poor households improve their livelihoods. The number of active farmers in the local organizations kept on increasing from 242 (in December 2013) to 592 (273 women, 260 men and 59 youths) in May 2016. With this craze, cavy is now well accepted at all social levels, even in Bukavu town where the dish price varies from 5-7.5US\$ in ordinary restaurants to 12-15US\$ in hotels; while a live cavy of about 1 kg costs from 1.5US\$ (villages) or 2US\$ (rural markets) to 3US\$ (urban markets). Cavy is also used to pay monthly primary school fees, one man-day for labour in crop cultivation, or to cover costs of mating a cow by a bull. It has become recognized far beyond the earlier prevailing image of poor men's food, or part of 'starter kits' for displaced people. It also provides a good



*A market restaurant specialized in fried cavy dishes in Sud-Kivu, DRC (photo: Samy Bacigale)*

alternative for reducing bush-meat hunting. Cavy feeding was enhanced by mixing locally available feedstuffs with improved forages, leading to higher productivity (up to 1500 g/ animal live weight). High phenotypic variability and two main genotypes (Kabare-Kalehe and Walungu) were identified by microsatellite markers among the cavy population in Sud-Kivu, opening ways towards genetic improvement. Management-based mating control was recently initiated against existing high inbreeding levels. However, challenges like unknown diseases, inadequate feeding practices, husbandry technics, uncontrolled breeding, and market organization for cavy products still need further interventions.

**Keywords:** Guinea pig, income generation, innovation platform, livelihood, poverty reduction.

# Cavy production: Promoting a solution against protein malnutrition of vulnerable people in Côte d'Ivoire [P]

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Although practiced in all sectors of the society, cavy production suffers from a lack of monitoring and technical advice. We surveyed several locations (Adiaké, Adzopé, Akoupé, San Pedro, Dimbokro, Yamoussoukro and Daloa) in the southern region of the country and found that cavies were managed at 78% by children and adolescents, helped by their mothers, however, very often without any prior training. The average number of cavies per farm was  $9.0 \pm 7.4$ . Cavy farming infrastructures are made of recycled materials (old buffets, stone blocks and barrels). Forage (Guinea grass—*Panicum maximum*, Milk weed—*Euphorbia heterophylla* and sweet potato leaves) is the main feed for cavies (66%); but farmers also used fruits (14%), tubers (10%) and kitchen waste (10%). Usually, no drinking water is supplied. Monitoring health of cavies is non-existent and causes many deadly diseases (bronchitis, pneumonia, salmonella and ringworm). The regular presence of predators (cats, dogs) and thieves in less protected farms also causes many deaths. Cavies from different agro-ecological zones (North, Central, South) studied by molecular markers, appeared to be from the same genepool and had a high rate of consanguinity (0.2257). The consumption of cavy meat is not subject to any taboo in Côte d'Ivoire. Also, animals are intended for marketing (61.2%) or consumption only. Good quality of the meat has been shown, especially that the carcass is enriched in omega 3-poly-unsaturated fatty acids after ingesting *E. heterophylla*. Sustainable farming practices require greater awareness of housing, the breeding system, genetic improvement and marketing as well as management of cavies.

**Keywords:** Animal nutrition, guinea pig, livestock production, meat quality, sustainability, youth.

# Cavies for enhancing ‘Nutrition-Sensitive Agriculture’ in Tanzania [P]

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Nutrition-sensitive agriculture is an approach that seeks to maximize agriculture’s contribution to nutrition. It is not surprising that many of Africa’s undernourished children are found in families who make their living by farming. This is because much of the agricultural production is focusing on staple crops such as maize, rice, sorghum or millets and cassava. These foods lack the variety of nutrients essential for healthy growth and development. Unfortunately, interventions designed to improve agriculture often focus on increasing the yield of these staple crops. Improving nutrition can be achieved by shifting the main focus to increasing the variety of nutrient-rich foods produced and consumed by these smallholder farm families – and this is where cavies can be an important intervention by providing a rich source of protein and micro-nutrients in diets. Unlike the larger livestock, cavies are generally controlled by women, allowing for great extent of empowerment, another critical aspect of nutrition-sensitive agriculture. Cavies can survive on very small amount of feed, which include grass and kitchen left-over foods. This characteristic makes cavies available for household food all year-round. However, in order to have

maximum nutritional benefits, nutrition knowledge is necessary among the target households. This implies that efforts to promote cavies should be accompanied by provision of nutrition education, especially on the importance of dietary diversity that incorporates animal-based foods, as well as other measures such as safe water and hygiene. Measures to improve the size of the animals are also necessary such as breeding and adequate feeding. Most cavies are produced in the Southern Highlands of Tanzania, but the animal is found all over the country, with an estimated total population of about 570,000 cavies in 2008.



*A typical East African meal with starchy staple (maize ‘ugali’), green vegetables (left) and beans (right back), but adding a cavy meat dish (right front) (photo: Theda Matthiesen)*

**Keywords:** Animal-source food, guinea pig, livestock, nutrition education, nutrition security, women empowerment.

# Cavy production in South America: Current situation and future trends [O]

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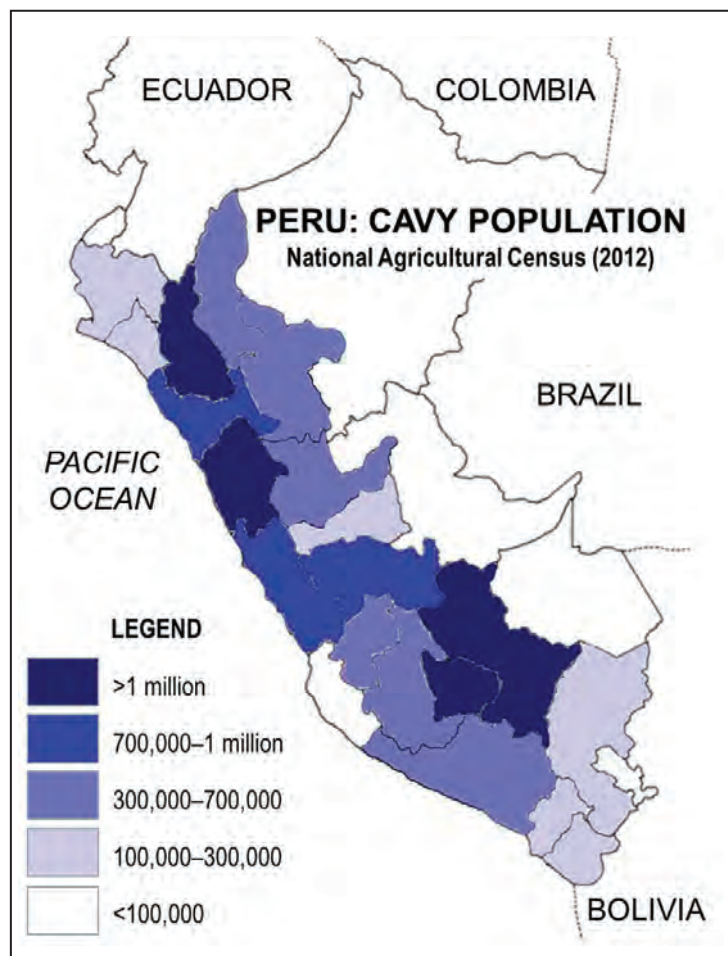
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Cavy production in South America takes place mainly in the Andean regions of Peru, Ecuador, Bolivia and Colombia. Since its domestication (sometime between 3000 and 6000 years ago) the cavy has been used in these countries as a source of animal protein produced with simple handling systems and adapted to the different geographical and cultural contexts. The production of cavies in these countries has grown significantly in the last years due to the promotion of its culinary and nutritional qualities. Also migration of population from rural to urban areas has brought their customs and generated a process of transculturation into the cities, which has turned massive the consumption of cavy meat. The increase in consumption has been accompanied by a growth of supply that, with some differences between countries, has allowed the development of commercial production. This adds new challenges to the ones existing in family production, which is more closely related to food and nutrition security. As a cultural food, cavies are also exported in small quantities from Peru and Ecuador (about 23.5 tons per year from both) to the USA and some European countries to cater for the demand of the Andean diaspora. The prospects of this productive activity are very good, expecting greater demand for the product in the future. However, there is need to work in promoting the association of small farmers, the creation and/or strengthening of support services to this activity (e.g. credit, technical assistance and others) and the development of technologies for both small- and large-scale producers.

**Keywords:** Andean countries, commercial production, cultural food, family production, food security, guinea pig, smallholder, transculturation, urban demand.



# Key areas of cavy production in the Andean region of Peru: Housing, management, feeds, and social and economic issues [P]

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The poster presents the challenges and results of cavy production projects implemented to enhance the income of 400 rural households in the District of San Marcos, Province of Huari in the Andean Region of Ancash Department, Peru with the support of Antamina Mining Company, and within the framework of its Corporate Social Responsibility Program. The project's main aim was to engage and accompany the cavy producers in their transition from a family dimension of practice to a mixed family/commercial dimension and, for the most advanced cases, into a whole business dimension. The monitoring of project experiences document the different characteristics, including the number of female animals in reproduction, their feeding and the level of producers' association achieved according to the different dimensions. They also show how cavy production can ensure, at the same time, healthy food security and better household incomes in remote rural areas such as the ones of the Andean Region.

**Keywords:** Business, commercial production, development, guinea pig, livelihood, production intensification.



*Traditional semi-commercial cavy husbandry in cages in the Andean region of Peru  
(photo: Ricardo Ordoñez-Noriega)*

# Commercial cavy production in Ecuador [P]

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In the Andean region, there are very few commercial cavy production sites, i.e. having more than 2,000 mothers and structured as a business whose purpose is to generate profits. All commercial enterprises should start with a market study to ensure the sustainable sale of their entire production. Another precondition is to have adequate facilities using a 'cavy-pen-system' with sufficient capacity for the cavy number to be managed, built with good materials to ensure duration. Irrigation and drinking water needs to be available as well as electricity, telephone and other communication routes. The interior layout of the 'cavy-pen' should consist of climate-suitable compartments that allow using reproduction management. Ideal conditions for cavies are temperatures of 18-22°C and less than 70% relative humidity. An alternative system is rearing cavies in 'iron-mesh-wire-cages' for direct grazing, moving them twice a day on the pasture. This system makes healthier animals as they enter a clean place every day. Forage crops must be available that ensure permanent, abundant forage of adequate quality and year-round low-cost production. Most important factors for this are adequate climate, soil, topography, availability of irrigation and the entire necessary infrastructure. In commercial production, using concentrate feed is essential to obtain the maximum yields that animal genetics allows. Finally, genetically improved animals will guarantee productivity and maintain a well-structured and permanent improvement program. It is recommended to maintain an elite squad for the production of the breeders and a space for commercial production. Any commercial enterprise should know and use the technology available regarding reproductive health and nutritional management; and it should have trained and qualified personnel to correctly perform everyday necessary tasks. Marketing channels leading to end-consumers and avoiding as far as possible intermediaries will make the business successful.

**Keywords:** Business, cavy-pen-system, guinea pig, large-scale production, marketing, production conditions.



*Large scale cavy production in South America*

# Domestic cavies in Bolivia: Small livestock with big potential [P]

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Domestic cavies are the symbol of fertility in the Santa Vera Cruz Tatala Celebration held every first days of May. 'Cosmovisión' (i.e. philosophy of life) of the cavy are very important for the population of the Inter-Andean valleys of Bolivia in which cavies are the principal livestock. Cavies play an important role for food security and sovereignty of the peri-urban population in the city of Cochabamba. Cavy culture has three dimensions: (i) Cosmovision: Cavies are present at rites to ask and thank for fertility in general; (ii) Food security: Providing protein for families with a clean meat; and (iii) Upgrading: Dynamic marketing for cavy meat at marketplaces and supermarket chains increase the demand through adverts, local fairs and restaurants where cavy-based dishes are prepared. There are different types of cavies: native breeds and enhanced populations, the latter with genetic material from Peru and Ecuador. Cavies are fed with kitchen scraps (basic system), balanced diets (intermediate) and/or with pelleted feeds (advanced). An important by-product of cavies is organic manure for gardening. A public university (Mejocuy Project) and private agencies (e.g. World Vision) are involved in developing the cavy sector and local cavy platforms such as the PDPC-Cochabamba to upgrade the product by processing. The Nutrition Zero Program (2013-2015) was a joint program of the Ministry of Rural Development and Lands and the Cochabamba City Municipality. The role of the Department of Consumer's Affairs was to enhance cavy food safety at restaurants and the promotion of this alternative meat at weekly local fairs such as the 'Feria del Cuy' (Cavy Fair) in order to increase demand for cavy.

**Keywords:** Guinea pig, food security, livestock, marketing, platform, promotion.



*Promotion of different cavy dishes in a fair in Bolivia (photo: Eduardo Lopez)*



# Strengthening food security through cavy family production in Bolivia [P]

Angel REYNA ZACONETA, Guido UGARTE, Tito ARUQUIPA, Rodolfo RIOS, Bladimir PRADO, Luis Fernando CLAROS and Jorge AYALA

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Bolivia is politically divided into 9 departments, 112 provinces and 339 municipalities, which are the smallest administrative territorial units, where the actions of the government and development organizations are coordinated and implemented. The municipalities are classified in 3 levels of vulnerability to food insecurity, where approximately 1,148,000 inhabitants (30.1% of the population) are in level 3 (i.e. most extreme vulnerability). In this context, World Vision Bolivia has implemented since 2010 several projects of cavy production in the highlands and valley zones. Over 500 vulnerable families have benefitted from the projects, which have included four components:

- Organization. Enabling to promote producers' association where they manage their production, markets and linkage to public actors to identify opportunities for public funds to support the production.
- Production. With genetic upgrade (mainly breed 'Peru', followed by 'Andina' and 'Inti') and the implementation of family production pens.
- Capacity building. With technical assistance and training in technical handling, health, cavy feeding/nutrition.
- Access to markets. With the promotion of cavy consumption and marketing; fairs, seminars, advertising spots.

Currently, producers sell approximately 1000 covies per month; their cavy family consumption help improve children's nutrition especially those under 5 years of age. Families consume cavy between once per week to once per month. The organizational management has formed a platform where public and private actors participate to improve cavy production.

**Keywords:** Capacity building, marketing, nutrition security, platform, poverty reduction, producer organization.

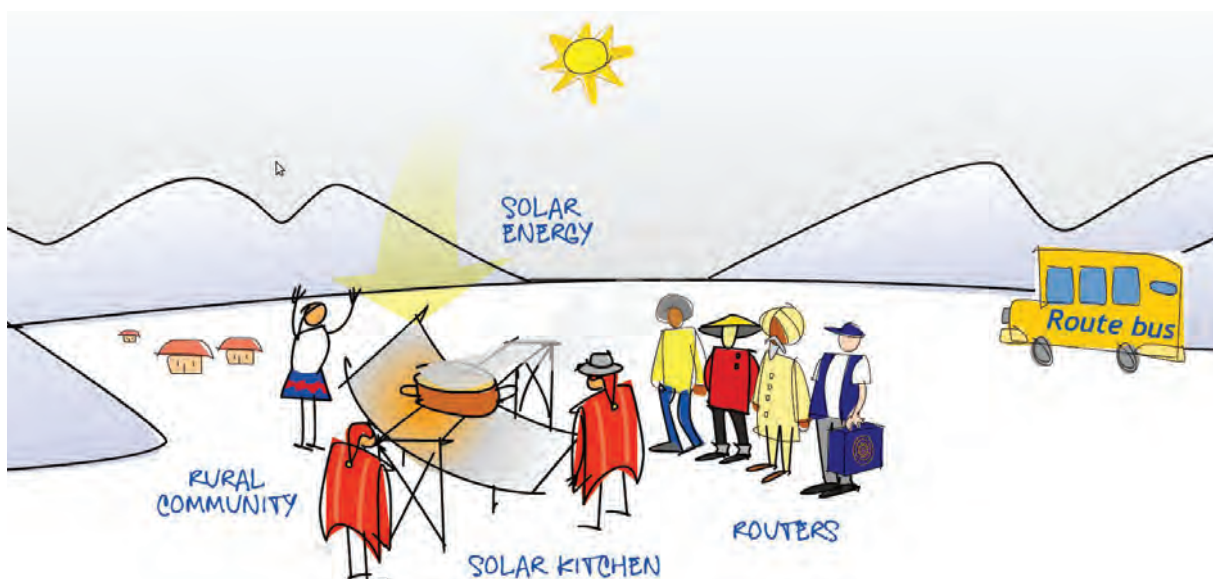
# PROCASUR: Harvesting innovations, spreading opportunities [O]

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PROCASUR Corporation is a global non-governmental organization specialized in harvesting and scaling-up home-grown innovations. The organization's mission is to foster local knowledge exchange to end rural poverty. By sharing innovations through customized local knowledge-management tools and methodologies, PROCASUR connects global institutions with local champions, providing the structured learning platforms necessary to spread innovations. Since 1996, PROCASUR has worked as a knowledge broker for the Global South, linking international institutions and regional organizations with local governments, rural champions and communities to identify, nourish and share innovative ideas. Some of the methods and instruments used to promote the adoption and adaptation of best practices are the Learning Routes, Learning Territories, Technical Assistance for integrated solutions to manage knowledge, and targeted actions like the Rural Youth Programme. A Learning Route is a capacity building tool structured and operationalized as an innovation journey with specific learning objectives, encouraging active and mutual knowledge exchange between participants and local champions. Learning Routes enable lesson learning, advance knowledge management with concrete results, allow efficient dissemination of information and inspire scaling up of the best, field-tested innovations in rural development within and across regions. Taylor-made to each client and thematically structured around specific learning objectives, the Routes promote experiential exchange and interaction, through which local people become trainers to their peers. For example, based on a Peruvian Learning Route and back to their country, Vietnamese delegates have adapted the CLAR approach and methodology to their specific country context. CLAR is a model for competitive allocation of financial resources previously introduced and further adapted to the Peruvian context, where it is now being mainstreamed and institutionalized. PROCASUR has facilitated learning opportunities in over 30 countries on three continents, including South-South learning and could, thus, similarly affect positively the lives and livelihoods of thousands of cavy producers.

**Keywords:** Capacity building, knowledge management, learning route, local champion, South-South cooperation.



A PROCASUR learning route

# The roles of breeding and husbandry for improving cavy production in Peru [O]

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Animal production is supported by four pillars: genetics, nutrition, livestock management and health. In Peru, the cavy program started making changes by handling the reproduction system. The population was organized for mating in groups with 1 male and 7 females; the feed was only forage, supplemented by a ration adding necessary nutrients. Cavies were selected for production characteristics that allowed the formation of breeds ('razas'). Biosafety management programs were applied to prevent animals from getting sick. The genetic improvement program began with selecting two essential characteristics, resulting in economic benefits to the producer. Precocity permits cavies to come to market in less time (56 days old – breed 'Peru'), with an efficient feed conversion ratio (2.68 : 1) and a carcass yield of 72%. Its relationship muscle : bone in the hind limb (hip, thigh and leg) is 5.6 : 1; and better muscle structure was determined by histological cuts. Prolificacy (breed 'Andina') determines a litter size of 3.9 offspring/delivery and the ability that 78% of the breeding present post-partum oestrus. Interracial crossbreeding allows a hybrid that improves productivity on farms by forming non-inbred populations. The optimum first breeding age was determined for females at 8 or 9 weeks and for males at 12 weeks. Oestrus synchronization allowed better management of nursing, with better environment and feed management. The mortality rate decreased achieving survival of larger litter size. In the highlands, improved productivity was attained by crossing improved cavies with the original native cavies, while preserving genetic diversity of the native animals. After years of research, producing cavies went from being just a domestic self-sustaining activity to a productive and large-scale activity that has generated jobs for rural women. Cavy meat consumption of children and pregnant women has helped to reduce malnutrition in Peru.

**Keywords:** Animal nutrition, breeding, genetics, guinea pig, livestock management, non-conventional livestock.

# The socio-economic role of cavies among women in DR Congo, Sud-Kivu Province [O]

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Livestock play an important socio-economic role in the lives of people. Domestic cavies are considered one of the promising small livestock species with great potential for commercialization by resource-poor farmers and especially women, due to low capital requirements for beginners, minimal equipment, space and labour. Women in rural Sub-Sahara Africa are known to keep these culturally acceptable animals for their households' food security and for incomes. This paper examines the socio-economic and cultural potential for cavies in enhancing food and nutrition security, increasing households' and especially women's incomes as well as giving them a voice and agency in their respective communities through Cavy Innovation Platforms (IP). Cavies in eastern Democratic Republic of Congo (DRC) provide an easy avenue for women to access and own assets required to create wealth and move their families from destitution. Women constitute 64% of cavy producers and traders in Sud-Kivu. They make the majority of the members of Cavy IPs where they have taken leadership roles. Through IPs, women reach the markets with better bargaining powers and demanding better prices than before. IPs also helped to enhance cavy meat acceptability. Household members previously without the habit of cavy meat consumption are



Women selling cavies at a market in DRC (photo: Wanjiku Chiuri)

now eating it as they got impressed by the increasing demand from Bukavu town. Cavies in DRC, Sud-Kivu province are the only asset that women and children/youth can own without much cultural inhibitions. Promotion of cavies among women in DRC ensures the country meets several of its Sustainable Development Goals. It is unfortunate that cavies are yet to be included in the formal livestock research agenda in DRC.

**Keywords:** Consumption, guinea pig, empowerment, innovation platform, livelihoods, women, youth.

# Developing a project on South-South collaboration with focus on cavies as a potentially useful development solution [O]

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In a collaborative project among institutional partners from Kenya, Cameroon, DR Congo and Australia between 2011 and 2014, domestic cavies were identified as a possible means for poverty reduction and their distribution, production and use in sub-Saharan Africa (SSA) was established. We now aim to turn the acquired knowledge into development solutions as quickly as possible by involving South American partners. In South America (LAC), a plethora of individuals and institutions exists with both traditional and modern knowledge about the use of cavies for addressing several development challenges. The aim of building future South-South cooperation between partners from both continents is to draw on experiences and accelerating progress to potential interventions that can be identified through the interaction of various stakeholders along the value chain (VC) from both LAC and SSA. Organizing VC stakeholders through innovation platforms will remain central to the new project phase. Differential knowledge management and capacity building according to the need of specific VC actors will be critical for this next phase, as will be the drawing on ICT tools to address the challenges of travel and distance. The project's balance between research and development, however, needs to be discussed during the symposium. Disciplinary science will be applied where necessary as important researchable questions remain, e.g. in technology adaptation, animal health, or on nutritional and socio-economic impacts particularly on children and women, respectively. Participants of the symposium are expected to help prioritize some of the areas for research. Based on their experiences, PROCASUR will act as a broker for this South-South collaboration with special emphasis on learning. Project ideas will be discussed among all symposium participants.

**Keywords:** Capacity building, development, innovation platform, knowledge management, learning, research, South-South collaboration.

# Summary from symposium discussions

## Observations from the field days

The cavies available in about four stands at Mvog-Ada market in Yaoundé caused astonishment among South American visitors as they appeared very small (300-400 g live weight) and highly tame. The market sellers stated that they did not have access to their normal supply of cavies from the Northwest Region (NW) as there was an outbreak of bird flu and, consequently, poultry was currently not allowed to be transported; but cavies are usually traded together with poultry as they are not part of the current livestock transport policy in the country. So the current market supply was sourced from around Yaoundé, an area less typical for cavy culture. Usually, traders like to buy cavies from NW (i.e. Bafusam and Bamenda) as they are cheaper (about 500 CFA, ca. 0.83 US\$) than in Yaoundé (about 2500 CFA, ca. 4.20 US\$), where they are considered a luxury food item.

The two visited farms in Nkolmetet division, Southeast of Yaoundé, kept cavies in the traditional way in the kitchen without any reproduction management. Visitors from South America were surprised about the humid tropical, almost lowland (about 500 m asl.) environment where cavies were reared, as the animal's optimum temperature range is 18-22°C with less than 70% relative humidity. There was speculation whether cavy ecotypes might have developed in some parts of Africa that would be adapted to the local tropical conditions. On the other hand, cavies again were rather small and most farmers had between 10 and 20 animals. South American visitors suggested that, for surveys, not the overall cavy population of a household be counted due to rapid fluctuations over the year, but rather the number of mothers, which would better express the size of an enterprise. The third farm had abandoned a type of cages promoted by the NGO AEAC (Association des Eleveurs et Agriculteurs du Cameroun), which seemed inadequate due to too dense mesh netting. This could be prone to causing accidents with the cavies' feet. The cages also looked difficult to be kept clean and would lack aeration, which again would cause too high temperatures.

At the technical training school EPAB in Binguela, Southwest of Yaoundé, there was a small, relatively new cavy unit for training. Cavies were kept in cages that, again, had too dense mesh netting. Also, the pen was observed to have too little light for triggering oestrus and seemed too little aerated – all considered important environmental factors for successful cavy rearing according to the South American visitors.



*Cavy expert Lilia Chauca-Francia from Peru discussing with Cameroonian cavy farmers in Nkolmetet (photo: BL Maass)*

## World café

Themes were discussed in six World Café tables each dealing with one main issue previously identified in plenary discussions and during the presentation of the posters. Questions were posed towards developing a vision for a thriving cavy industry and home consumption. Gender, knowledge management and capacity building should be considered in all the six thematic topics. Guiding questions for the discussions were:

1. What are the opportunities, emerging themes and new directions for a thriving cavy industry and home consumption?
2. What challenges persist for the cavy producer?
3. What topics should be prioritized and be considered in a future project?

Short summaries from each session follow as compiled by the rapporteurs who headed each table.

### 1. ANIMAL HEALTH

**Rapporteur: Christian BARRANTES**

A number of opportunities were perceived, such as starting research on cavies in Africa, the motivation of some universities and the relationship begun with other institutions from South America. It was perceived that there was adaptability and resistances to diseases in African cavies. Certain forages could foster the health of cavies, and there was some basic and traditional knowledge available about veterinary treatments.

Main challenges seen by the participants were that there was almost no formal knowledge available about cavy diseases in Africa; no formal treatments were available/known for cavy diseases; there was also no training on animal health of cavies as it was not included in the curricula. Zoonotic diseases could pose challenges on cavy culture in Africa; and housing and husbandry problems might aggravate animal health issues. One of the biggest challenges brought up was that institutions overlook cavies as they are small animals.

Priorities should be research on diseases, including diagnosis, prevention and control. Capacity building should take place at two levels, universities/academic and farmers. Good practices for cavy husbandry need to be developed. Manuals and protocols should be available and diffusion strategies need to be developed derived from lessons learned by South American colleagues.

### 2. MANAGING PRODUCTION

**Rapporteur: Brigitte L. MAASS**

Managing production concerned issues such as feeding, breeding, input supply and housing, while animal health was discussed at a separate table. Among the opportunities (priorities are given in squared brackets behind the topics; 1st = highest), participants stated that it was most important to change the housing from free roaming to confined keeping structures, i.e. pens or cages [1st]; this also refers to designing appropriate cages for certain steps in the production cycle, e.g. for mothers; but also generally using local materials for housing/production; which all will directly result in improving sanitation and hygiene. The next priority was on managing animals according to classes (male, female, breeders, fatteners, and pregnant/non-pregnant) [2nd]. Another opportunity was to improve feeding according to animal requirements [6th]. Also better forages could be used, e.g. in some areas it appears easy to produce more and/or better forages; the forage focus should be more on legumes than on low-quality

tropical grasses; and feeding/forages already known to be useful in South America could be more explored and adapted for Africa. Alternative feed sources that don't compete with human nutrition should also be explored. Regarding reproduction management and breeding, breeders could be selected and their performance could be monitored at village level. Improved animals could be bred (long-term), and the institutional set-up for animal breeding could be improved. The cavy genotypes identified by molecular markers could be deployed for breeding. Farmer training [4th] was seen as an important opportunity for knowledge management and capacity building; particularly as there is abundant technical knowledge available (mostly in South America); this could be targeted for African conditions and packaged in simple messages with pictures, pictograms, and/or video films. Furthermore, some technical research results exist already across Africa (especially in Cameroon) [3rd]. Institutional integration should happen for technology adaptation (not really 'transfer') [5th]. In some areas, available land could be better used. In Côte d'Ivoire, there is the view that techniques for cavy production are very similar to those of rabbit production, which could be applied.

Most important challenges were found in technical/technological and human capacity. Different items mentioned were to identify and train local champions/model farmers; to install cavy (small livestock?) training centres; or to develop/implement simple livestock management tools for record keeping. It was stated that no African country has a cavy breeding unit, breeding stock, or trained cavy breeders. To train cavy breeders and to establish an advanced cavy production model for SSA or an African country like the one from Peru was considered a challenge. Creating a structured cavy breeding system is needed to advance in performance; implementing breeding would also mean forming breeding committees at different levels, i.e. national, regional and local [7th]. Record-keeping would involve creating a cavy database. It was considered challenging to make Innovation Platforms the systemic extension approach and not apply the more traditional approach of 'technology transfer'. Integrating cavy farming into agricultural production systems and introducing practical cavy management into (primary/secondary) schools were stated. A major issue raised was that the multiple languages of experts and published advances on cavy knowledge would require translation. It was perceived challenging to differentiate technology according to the production realities in the different regions of a country and in different countries with cavy culture.

### 3. HUMAN NUTRITION

#### **Rapporteur: Appolinaire DJIKENG**

Cavies offer many opportunities for human nutrition. They are now accepted as a source of good proteins. The overall nutritional content is high in amino acids, and 'good fat' is contained. They provide a link to child development, especially as a source of nutrition for the first 1000 days. They are linked to Sustainable Development Goal (SDG) #2, on reducing malnutrition. Today, cavy consumption is also accepted as a substitute for bush meat consumption, which may help to reduce the incidence of zoonotic infections. They are part of nutrition-sensitive agriculture. There are no major religious or cultural barriers to cavy consumption. They can be farmed by all and year-round.

Among the challenges in cavy culture were mentioned: difficulties to mainstream cavy consumption, which would need to push for changing eating habits. On the other hand, low availability of cavies for the market or restaurants was complained about. While some saw limited options for cavy-based dishes, in Bolivia they moved from 4 cavy dishes to more than 20 recipes during the four years of a project. But overall limited knowledge in cooking options was acknowledged. Also, there was need perceived to move from cavy farming for sale to cavies to eat. It was stated that income generation not necessarily is



linked to improved nutrition; and of course, cavies are not a silver bullet for improved nutrition. Issues of transformation and transportation of cavies were considered further challenges for human nutrition.

Emerging themes and new directions seen by participants were the high cavy meat quality; the identification and vulgarization of various options/dishes based on cavy meat; processing of cavies for marketing, e.g. smoked, dry, vacuum-sealed. TV programs and other media and communication tools could show cavy consumption and its benefits for human health. For example in Bolivia, there are now government-led efforts to reduce bad nutrition (i.e. junk food) through promotion of cavy consumption in schools, where it is now mandatory; but this would need a legal framework to support it. More and more cavy fairs are organized in communities and in schools. Cavy meat can also be promoted for other dishes already consumed by communities. To further promote cavy meat consumption, renowned chefs could be collaborated with for both existing and development of new dishes.

#### 4. MARKETING AND CONSUMPTION

##### **Rapporteur: Wanjiku CHIURI**

Participants saw opportunities in the availability of demand; that almost no religious or cultural barriers exist; and that cavy meat is white meat. The existence of basic knowledge on cavy generally and in Africa in particular, as well as the chance to obtain better knowledge of the nutritional profile of cavy meat were considered positive. In some areas, the political environment is conducive; and institutional structures for linkage with the stakeholders (IPs) have already been set up in some areas. The existence of radio, television and newspaper series for promoting cavy dishes was observed (e.g. World Vision project in Bolivia). Chances were seen for gender equality and women empowerment. Marketing is not restricted to meat alone, but cavy manure, fur and bones have their own value (ash from cavy fur is medicinal – it cures cuts and bruises; ashes from bones are used for teething children; burning cavy droppings produces smoke that is a mosquito repellent). Marketing cavies either alive or in carcass form is logistically very easy compared to other animals.

Then again, several challenges were said to exist: Generally, there was poor/inadequate infrastructure along the value-chain (from caging at farm level, to roads etc.). Marketing structures were considered insufficient/poorly organized and overall market information was poor. Also, norms for quality standards of cavy products were absent. Advertisement was poor. Most small-scale farmers globally do not have an agenda. Too much emphasis was seen on production, while little attention was given on the other nodes of the cavy value chain. Regarding nutrition aspects, nutritional education in general is not yet well addressed to cavy consumers, and there are neither adequate recipes for cavy meat, nor enough knowledgeable chefs. Particularly, there is poor understanding of the value of cavy meat as another white meat.

Many priorities were identified that have been grouped according to three major themes:

- Assess the different actors along the value chain and capacity-build them on the business aspects. Map out the opportunity demand of the cavy meat. Improve all aspects of processing, marketing and transportation; and apply gender mainstreaming.
- Promote nutrition-sensitive agriculture; and develop models for making cavy farming a business like, for example, in Peru.
- Promote cavy meat consumption as an alternative white meat in addition to others like chicken and fish. Apply vigorous advertising and promotion of cavy meat, cavy recipes and manuals. Use

radio, television, newspapers and exhibitions for advertising cavy dishes. Utilize World Food Day (every year on 16 October), national food days and other agricultural exhibitions to promote and market cavy products. Promote carcass marketing especially for urban consumers.

## 5. CONSUMER BEHAVIOR

**Rapporteur: Carlos SERE**

Among the opportunities, it was stated that the taste of cavy meat can be similar to bushmeat, in particular, to African bush and rock rats, a highly preferred bushmeat in parts of the forest zone. Cavies are eaten as a snack with drinks and in restaurants as special dishes. Surprise was expressed that consumers were willing to pay such a relatively high price per kilogram of cavy meat when compared to chicken or pork. The present emphasis on nutrition-sensitive agriculture and the general concern about nutrition can help to include cavy issues in broader communication efforts towards social and behaviour change. Schools could be an effective conduit to assess the acceptability and consumption of cavies, as children will be more candid and frank about the family's attitudes to cavies than when parents themselves were asked. Cavies are not only demanded for consumption as meat but are also used for cultural celebrations and gifts, as breeding material, and for health applications (use of the ashes of bones as sources of Calcium and Phosphorus was mentioned). There is also some demand for laboratory animals and pets.

Challenges stated were that many African consumers are not familiar with cavies. In some cases, there is cultural rejection of cavy meat consumption. Nutritional aspects of cavy consumption are not sufficiently known in Africa (Omega-3 fatty acids, iron, and amino acid composition of the proteins). The market supply of cavies is not regular and quantities available tend to be limited. The small size of cavies in Africa was considered a constraint for consumer acceptance. In urban areas of South America, brown- or white-coloured cavies are preferred to those with patches of darker skin, which might be perceived as bruises or hematomas; this is less of an issue in rural settings where home consumption is important. Some participants felt that the extent of home consumption of cavies was seriously underestimated.

Three aspects were identified as priorities:

- Market analysis, including knowledge, attitudes, practices and perceptions. Peruvian colleagues mentioned market studies undertaken in Lima. Consumption seems to be frequently linked to special celebrations such as Easter, Assumption, 'Eid, and Christmas. Branding of processed cavies was considered an option to promote their consumption, avoiding the need for the consumer to slaughter, cook etc. (making it a convenience food) and to make restaurants serving cavies more visible to the consumer (CAVILAND experience in Cameroon).
- Communication leading to promotion, including nutritional aspects, recipes, organoleptic tastings, radio and TV spots.
- Nutrition-sensitive value chain analyses to understand the interplay between expanding consumption and increasing supply. There was controversy among participants about the need to work more on demand, which creates the incentives for farmers to increase supply.

## 6. POLICY AND ADVOCACY

**Rapporteur: Bruce PENGELLY**

The table on policy and advocacy had a different approach. First of all, 'Policy' was defined by listing the range of institutes and agencies to consider:

- Government and regions (i.e. AU/NEPAD; regional organizations like ECOWAS, CEMAC, CORAF, ASARECA; national, provincial and district-level)
- NGOs
- Private sector (i.e. banks, food markets, packaging, transport)
- Donors (e.g. DFAT/Australia, IDRC/Canada, IFAD)
- Research agencies (BeCA/ILRI, Universities, others)

Then the question was posed where cavies might fit in policies and how we would advocate a cavy project? Clearly, no one will have 'a policy on cavies' as such. But, there will be other policies that encompass different aspects of improving cavy culture, e.g. on food security; gender; maternal and child welfare and health; environment and biodiversity; livelihoods; and others (e.g. mining?). So, what mix of policies would we frame a project in, and with what priorities for each potential partner and donor?

Some key advocacy issues were raised. First of all, there is a need for hard figures on the importance of cavies per country. Critical advocates from civil society are needed (comment: a government may not fund cavies because it refers to women and children, and animals are usually not seen). We need the ex-ministers, people of note, the famous singer/actor/footballer or others to be national advocates. For example, THE major bank in Peru aligns themselves with cavies; and even the incoming Peruvian President says he is 'President of Cavies' ('Pepe Kuy'). We must acknowledge that cavies have environmental limitations – they cannot be raised everywhere (so say so and don't push boundaries). Messages must be designed and delivered in small pieces.

Some smaller scale but critical policy constraints/issues were identified. For example, the transport policy in Cameroon and the central African region; the police will stop traders that move cavies as the animal is not part of the current policies on livestock transport. Financial policies of banks for accessing finance do not include cavies. Agencies wanting to fund research will not produce development outcomes; on the other hand, agencies will not be able to do development without conducting some research in cavies. Participants suggest that the research methodology to be applied is critical; it must have IAR4D/IPs, and must be participatory. In some cases, a project must have particular mixes of partners (e.g. CORAF rules).

There is need for a particular focus on education and capacity building policies: Schools and technical colleges should get involved in a project; 'masterclasses' should be aligned with national education policies. The project ought to provide substance to the policies on education, food safety, biodiversity, rural communities, and national capability and leadership.

# Cavy project – strawman; design, focus and implementation

Presented by Bruce Pengelly

The current situation of cavy culture in South America and that in sub-Sahara Africa is characterized by a considerable unevenness (Figure 2). In general, research has enhanced the knowledge on optimal cavy rearing over the past decades. Besides, several improved cavy breeds released in South American countries are available for use in medium- to large-scale enterprises. Hence, 'local champions' exist that know best about cavy rearing, breeding and marketing to satisfy the constant demand for cavy meat in the market. As a traditional and cultural meat, cavy has high societal acceptance and even export prospects. This provides ample opportunity for learning by Africans and technology transfer to Africa, where the current status of cavy culture is at much lower level.

On the other hand, cavy ownership largely by women and youth as well as the lack of taboos or other cultural boundaries for cavy production and consumption are important advantages in SSA. Meat is in generally high demand and cavies could help to satisfy children's nutritional requirements. In addition, the previous cavy project has established Cavy Innovation Platforms at ward, provincial or national levels in Cameroon and eastern DRC. These functional platforms might be useful models for improving cavy culture in South America, where still large proportion of the marketed cavies (about 70% in Peru) are produced in traditional systems.

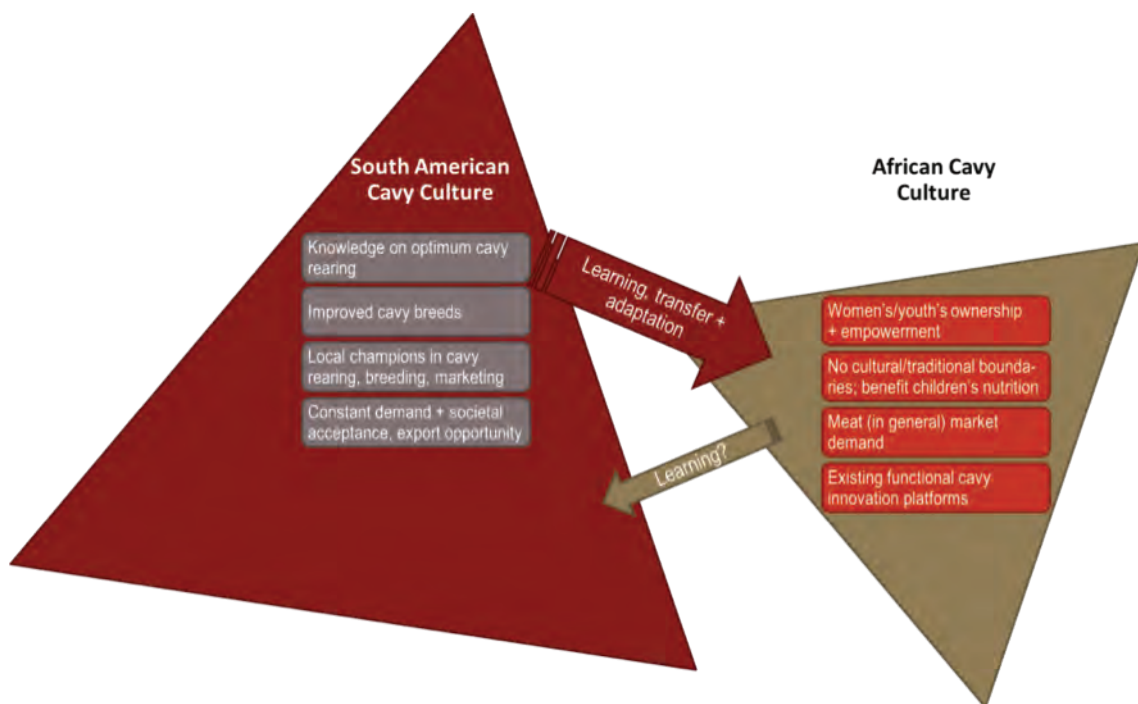


Figure 2. Unevenness of cavy culture in South America and sub-Sahara Africa and potential for South-South cooperation (by BL Maass)

## Framing the project

A future cavy project needs to be framed in terms of a path to impact. Specific objectives should aim to improve outcomes for both traditional and semi-commercial producers. It should result in more consumption in rural communities for improved human health impacts; however, assessing impact on human health takes considerable time and is difficult to measure without a substantial budget, specialists' skills and special ethical approvals. Readily assessable objectives would be improved incomes for rural households and communities, especially for women and youth and, generally, better livelihoods. Improved value chains in terms of reliability and quality should be considered, which would result in higher demand and supply, and also safer food as value chains become more sophisticated as demand grows. Finally, the project would aim to develop broader and larger markets (spatially – both national and export).

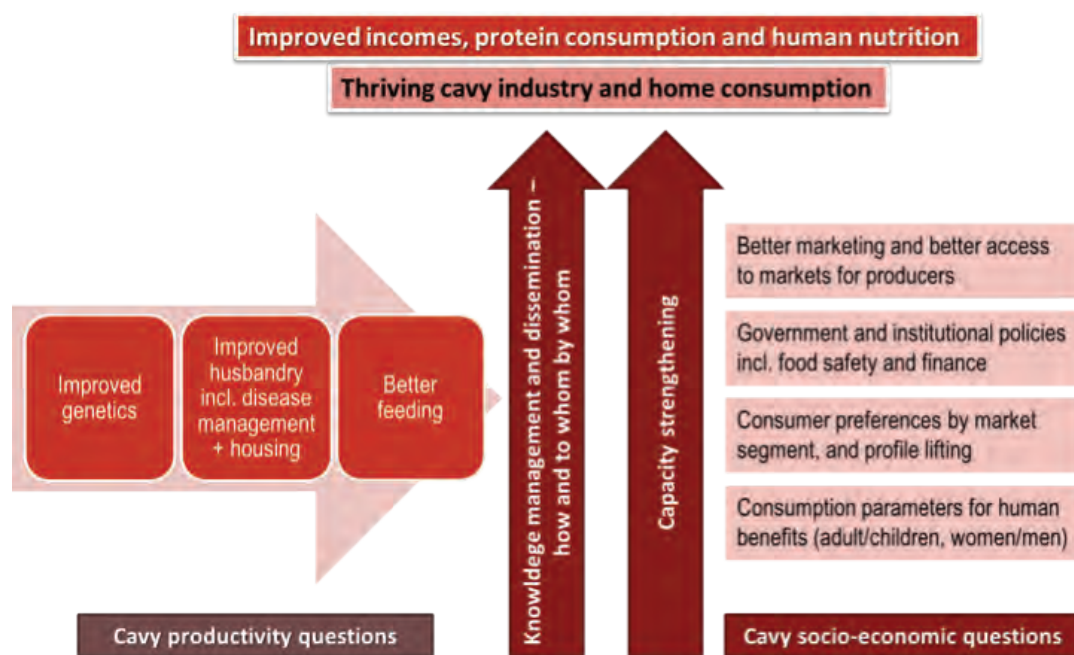


Figure 3. Objectives and components of a future cavy project (by BC Pengelly)

While R&D questions would be around productivity and socio-economics (Figure 3), the core of the project has to emphasize knowledge management and dissemination as well as capacity strengthening. From the beginning, it has to be recognized that there is no special policy for cavies. However, the project must be designed to align with both regional and national policies. There is a diversity of regional, national and provincial government policies on food security, maternal and child welfare, health, environment, gender and livelihood, among others, in which the project might be framed. Also, R&D agencies including NGOs have defined policies on which they frame their investment and focus. The project must have a regional or sub-regional framing; taking into account, for example, CAADP (Comprehensive Africa Agriculture Development Programme) or the Sustainable Development Goals (SDG). From the start, it should be recognized that there is a need to align with potential donor's policies (e.g. IFAD, Canada etc.).

## Project and partner scale

The project should recognize that each country has different production and consumption realities (e.g. Cameroon vs. eastern DRC), meaning that the project design recognizes existing diversity and does not

expand to too many different African countries (no more than 3-4?) as one size and one approach will not fit all potential partner countries. It will be impossible to start with implementation everywhere; there will be a need to stagger. South American project partners have to be built in from the design phase. The project will include a diverse set of members, such as universities, national agencies, NGOs, key private sector representatives from each country and ILRI/BecA.

## Focus of a research for development project

A major focus of the project needs to be on production; this means introducing best practice husbandry into African cavy culture as known today in South America. There will be the opportunity to introduce improved genetics both from Africa and possibly South America. However, how new germplasm might be disseminated in each country needs to be designed; e.g. will national or regional breeding centres be established? Improved animal health might well be the major issue; this refers to the interactions of genetics x diet x housing x management x diseases and parasites. Apparently, improving animal management could make a difference (e.g. housing/cages, hygiene, controlled breeding, sexing progeny, different management of breeders and finishing cohorts). Improved feeding/forage options have to fit local environments both physically and socially, and take into account forage attributes (digestibility, availability, feed profiles). Certainly, supply of adequate forage and good quality water will be essential in emerging production systems, and for the forage at least, this will probably require new strategies. Preferential feeding to meet markets is important, especially if production is targeted for special markets such as those associated with particular ceremonies, which are likely to generate peaks both in demand and price.

The second focus of the project lies on understanding existing value chain(s) and improving them. Producers can realize better returns if they can align their marketing to the shape of the demand throughout the year (i.e. Christmas, Easter, 'Eid, or other holidays); importantly, the shape of the demand needs to be defined with reference to different African contexts. Another emphasis would be on understanding price advantages; why are cavies priced over and above rabbits per unit of weight? There are several other open questions: For example, what is the nutritional value of cavy meat? But we also need to reflect on how important this question is and whether there would be real benefit in diverting resources and focus on this. Nevertheless, it is related to the question of how much consumption is required to make a difference in maternal and child health. What are the food safety advantages of cavies (portion-perfect)? What extras need to be included with respect to food safety as commercialization grows? What proportion of cavies is for home consumption? What is the current size and potential size of the city/restaurant market?

## Innovation platforms as R4D model

The most practical option for progressing cavy R&D is likely to be by working with organized farmers and value chain structures such as the existing cavy innovation platforms (IPs) of Cameroon and eastern DRC, which include actors from along the cavy value chain (Figure 4). A decision has to be made on how many IPs should be nurtured per country (3-4?) and at which level, e.g. district. IPs require (i) financial support that reflects their proposed technical and socio-economic as well as capacity building activities; (ii) a dedicated IP facilitator; (iii) an appropriate membership mix of producers, traders, market and technical specialists; (iv) underpinning by local experts from the project team; and (v) a commitment to ensure that both IP facilitators and members are trained on the aims and function of an IP and, especially, their potential role in implementing change.

The project will need an adaptive design from the start; this is essential for a project with a mix of research and development. There must be sufficient flexibility in the design to enable the project team to respond to what works and what does not. The budget should reflect the intended balance of R and D (ca. 35% for research?).

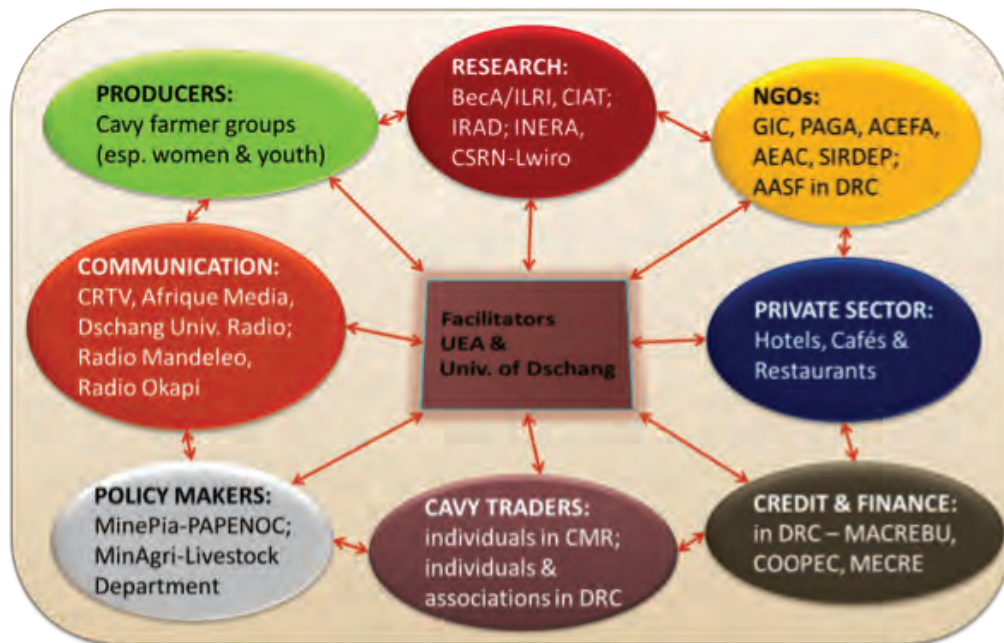


Figure 4. Structure of Cavy Innovation Platforms established in Cameroon and eastern DR Congo (by WL Chiuri and BL Maass)

## Some key research questions

Many of the interventions are well understood from previous experience in Africa and South America and will not need dedicated research focus or budgets; but other issues will. For example, a model needs to be developed on how to implement and monitor genetic improvement (including questions of adaptation of South American germplasm). Other research has to focus on understanding and addressing animal health constraints; market size and opportunities; and food quality and safety. Further, impacts on livelihoods need to be monitored. Guidelines for consumption have to be developed for maternal and child health (most of the required information is probably already known), and efforts to promote cavies should be accompanied by provision of nutrition education. Finally, early in the project the policy environment should be analysed to identify opportunities and constraints.

## The two pillars of the project: knowledge and capacity

For optimum [knowledge management and communication](#), the project will require communication plans and specialists. Simple summary documents can be developed on “how to” based on available documents and “new-to-Africa” South American knowledge. Programs for rural radio should be produced for improving cavy production and marketing awareness as well as cavy meat promotion based on its qualities. Cavy meat preparation and presentation events can take place to support promotion and markets. Maximum use of phones and apps should be made for information transfer from the project to registered producers and value chain members. A project-managed web page for on-going

awareness and problem-solving between South American partners and Africa project members needs to be established.

**Capacity building** necessitates a well-considered plan and appropriate budget. IPs will require technical specialists on-the-ground. A program has to be established to build capability, with training on-going on at least a quarterly basis. The key personnel in project countries will require a small team of cavy specialists that should receive special training: (i) Key personnel will spend about 1-2 months in South America to better understand the finer details of South American cavy and its R4D environment. (ii) In Africa, masterclasses will be run to build capacity so that attendees can address the range of technical and socio-economic issues on the ground; these will need to be repeated at annual intervals. (iii) IPs will act as learning platforms for communities and value chains. In addition, the project planning and budget must contain some regular, extended, on-the-ground input and guidance from South American partners in Africa. As a key capacity building tool, plans and budgets should provide for cross district visits by producers and other value chain members (IPs) in order to learn from each other. Finally, provisions should also be made for science capacity building.

## Monitoring and evaluation

It is essential to have an M&E plan in place from the beginning to enable an adaptive project design to be used. Any donor that agrees to an adaptive project design will demand a sound M&E plan and budget. The project needs to be monitoring technologies, uptake, adaptation of technologies, as well as emerging constraints and opportunities. There has to be some key technical research monitoring such as genetics and health, but there also needs to be monitoring of markets, the source of animals, and fluctuations in demand and price.

## Some overall considerations

We need to recognize that one project cannot do everything listed above. What can the project do and what can be achieved ... “easily”? It will, consequently, be important to limit the number of countries and sites to a manageable level. We have to ensure that the design can take advantage of the South-South partnership as soon as possible in order to rapidly implement the expertise and experience of the South American partners. Differentiation is needed to address some urgent issues immediately, while some research can wait. The project-leading institution has to ensure that there is the best dedicated project management as such a role is not a part-time job. There has to be recognition that full implementation of a new African cavy industry will take at least 15 years and needs on-going support. The best business development strategy is to over-deliver on the last project!



# Concluding discussion and way forward

In the final session—a broad plenary discussion—symposium participants concluded that the opportunities for South-South cooperation in cavy culture were substantial. Many technology components could be transferred from South America and adapted to African conditions, similar to how poultry or swine production in South America advanced without much basic research on site. Also effective models for changing practices and attitudes could be applied and transferred in this cooperation. On the other hand, there is much need for practical capacity building regarding the application of proven technology and marketing actions in addition to awareness creation for the benefits of consuming cavy meat. Thereby, it should be kept in mind that capacity building also means ‘to learn to learn’.

The agenda for cavy R&D set up during the symposium was found very comprehensive, rather seeming a long-term program or a movement for a decade or so. Donors could be scared if the R&D agenda was too large. Though, participants recognized that there were many opportunities for tailoring smaller portions/modules into viable projects and targeting particular donors. It was suggested to divide the agenda into different phases that dealt with both the near and remote future so as to focus on key questions first before addressing the full breadth of the agenda. Actions could be identified that could be started immediately or in the near future (see below). Compiling a list of actions would also help to identify R&D gaps that needed interventions, for which people/institutions could be targeted. It was also considered to have a moderate to small activity program, some of which could be self-funded already. Some of this can be done by using existing facilities, continuing with current cavy-related R&D in order to build capacity and have good knowledge exchange.

Until a project will be implemented, it will be very important to keep a continuity of activities that are already funded; this can well be in a decentralized manner so that pieces of the overall agenda be addressed. Importantly, a network within and across countries should be formed soon, with ‘torch bearers’ or champions/focal points at national or regional level. Country or regional representation would be useful, such as for Cameroon, DRC, Côte d’Ivoire/Benin (for West Africa), Tanzania (for East Africa), South America (as a group); NGOs could come in as well, such as VSF-B, WCS, and World Vision. These focal points would help to exchange existing knowledge and inform on evolving developments, in addition to assisting in developing new projects and mobilizing funds. Further stakeholders for the different countries need to be mapped, while considering that mandates of different institutions have different emphases. Certainly, it will be critical to connect the whole by using suitable ICT tools; this means that a structure for communication and an information platform be established soon among the network participants that goes beyond the existing WikiCavy (<https://wikicavy.wikispaces.com/>). The need for a person for overall coordination was discussed.

Importantly, the network needs to expand beyond research and science as cavy production is a reality in substantial areas of SSA. It has to be ensured that relevant government (e.g. ministries) and non-government institutions help producers to develop and expand production. A program like PAPENOC (Programme d’Appui à l’Elevage Non Conventionnel) in Cameroon that was emphasizing non-conventional livestock species needs to be renewed to provide the necessary support to producers and traders. As a consequence, working towards production in the rural areas will create research needs. There seems to be opportunity to build country production strategies like in South America, which could become the driving forces for cavy culture in SSA.

## Immediate opportunities

Quick wins could be made by having the communication platform up and running and start advocating on a dedicated website. In addition, several opportunities were identified towards improving communication and awareness creation immediately to shed more light on cavies both in Africa and elsewhere worldwide:

- An emerging PROCASUR-project in North Peru funded by IFAD with its model of 'learning territory' for technology diffusion, in this case cavy production and marketing, could be useful for future South-South cooperation. PROCASUR has experience with peer-to-peer South-South learning in such 'learning territories' and could well use this project as a first building block. Besides, other learning territories already existing in SSA could also become involved. Similarly, IFAD is funding some projects with PROCASUR participation in several parts of SSA that could serve as starting points for a future project.
- The University of Dschang is already engaging to host a national meeting on non-conventional livestock with emphasis on cavies. A new university in Cameroon (Université des Montagnes in Bangangte) has joined cavy science and is involved in the animal's health with its Vet School.
- As there is less knowledge available in Côte d'Ivoire than in Cameroon, there is opportunity to apply technologies that have worked well in Cameroon and adapt them to local conditions. Areas of the country have been identified, where there are good cavy populations. Innovation Platforms could be set up and animal nutrition might be first improved before advancing in animal genetics.
- The national agrarian university La Molina in Lima is holding a small seminar in July 2016 to sensitize local Peruvian institutions, but also others from bilateral cooperation such as JICA, the Korean cooperation. In Peru there is interest to engage in South-South cooperation.
- At the international 'Tropentag' conference in Vienna in September 2016, Maass et al. are giving an oral presentation on the opportunity of South-South cooperation for improving cavy culture (<http://www.tropentag.de/2016/abstracts/full/1114.pdf>).
- The BecA-ILRI Hub can deliver on some cross-cutting issues; there is funding available e.g. for nutrition analysis and molecular diversity.
- The BecA-ILRI Hub will prepare a report to the donors of this symposium, Australia and Canada.

## Next steps

This symposium has served to commence building a global cavy R&D community. Cavies are considered a non-conventional, underutilized livestock species that is trapped in a vicious circle of neglect. However, there is much that can already be done to fill the two main proposed pillars – capacity development and knowledge management/awareness creation – with life from existing projects and current work. Most importantly, the vicious circle of neglect in African cavy culture needs to be broken; this requires to:

- Form a cavy R&D network within and across countries to exchange information and detect opportunities; this requires to soon establish a structure for communication, using ICT tools.
- Continue with awareness creation in many ways, including the creation of a new website for the cavy network, and remaking and updating the WikiCavy site, and by participating in or implementing public R&D events that include cavies or even focus on them;
- Actively engage in fund raising with a variety of possible donors, such as IDRC, IFAD, the Ford Foundation among others;
- Explore opportunities for South-South cooperation and how this interaction can be created in a functional manner; engage with those who already have some experience in this regard, such as PROCASUR;
- Explore local projects and organizations that might be interested as well as existing facilities to take up small portions of the agenda to keep going the long-term engagement;
- Prepare peer-reviewed publications from existing results to pursue establishing cavy culture in science; and
- Continue to build capacity by emphasizing cavies as one of the African livestock species in training and research conducted by fellows at the BecA-ILRI Hub.

African cavy culture has been dormant for decades if not centuries, trapped in a vicious circle of neglect. Continuing this vicious circle would cause yet another missed opportunity for improving livelihoods of the poor. The International Cavies Symposium has revealed a wealth of chances for African cavy culture to evolve by piggybacking on the impressive advances achieved in South America over the past decades. It appears high time that this transcontinental connection has been established and, hopefully, will develop into a vibrant multilateral partnership.

# Appendix

## Acronyms and abbreviations (language: En—English; Fr—French; Sp—Spanish)

AEAC	Fr	Association des Eleveurs et Agriculteurs du Cameroun
ASARECA	En	Association for Strengthening Agricultural Research in Eastern and Central Africa, Entebbe, Uganda
AU	En	African Union
Beca	En	Biosciences eastern and central Africa, at ILRI, Nairobi, Kenya
CAADP	En	Comprehensive Africa Agriculture Development Programme
CEMAC	Fr	Communauté Économique et Monétaire de l’Afrique Centrale
CGIAR	En	Consultative Group on International Agricultural Research
CIDES-UMSA	Sp	Postgraduate in ‘Ciencias del Desarrollo’ at ‘Universidad Mayor de San Andrés’, La Paz, Bolivia
CORAF	Fr	West and Central African Council for Agricultural Research and Development
CSIRO	En	Commonwealth Scientific and Industrial Research Organisation, Australia
DFAT	En	Department of Foreign Affairs and Trade, Australia
DRC	En	Democratic Republic of Congo
ECOWAS	En	Economic Community of West African States
EPAB	Fr	Ecole Pratique d’Agriculture de Binguela, Cameroon
ESPE	Sp	Escuela Politécnica del Ejército, Ecuador
FAO	En	Food and Agriculture Organization of the United Nations
IAR4D	En	Integrated agricultural research for development
ICT	En	Information and communication technology

IDRC	En	International Development Research Centre, Canada
IFAD	En	International Fund for Agricultural Development
IITA	En	International Institute of Tropical Agriculture, a member of the CGIAR
ILRI	En	International Livestock Research Institute, a member of the CGIAR
INIA	Sp	Instituto Nacional de Innovación Agraria, Peru
IP	En	Innovation platform
IRAD	Fr	Institute of Agricultural Research for Development, Cameroon
MINEPIA	En	Ministry of Livestock, Fisheries and Animal Industries, Cameroon
JICA	En	Japan International Cooperation Agency
NARS	En	National Agricultural Research Systems
NEPAD	En	New Partnership for Africa's Development
NGO	En	Non-governmental organization
PAPENOC	Fr	Programme d'Appui a l'Élevage Non Conventionnel
PROCASUR	Sp	A Latin America-based NGO; originally, 'Programa Regional de Capacitación en Desarrollo Rural', later changed to 'Corporación Regional de Capacitación en Desarrollo Rural', meaning Regional Corporation of Capacity Building in Rural Development
PDPC	Sp	'Plan de Desarrollo Provincial Concertado' meaning Concerted Provincial Development Plan
SDG	En	Sustainable development goals
SUA	En	Sokoine University of Agriculture, Morogoro, Tanzania
TALIRI	En	Tanzania Livestock Research Institute
UEA	Fr	Université Evangélique en Afrique, Bukavu, DR Congo
UNALM	Sp	Universidad Nacional Agraria La Molina, Lima
VC	En	Value chain
VSF-B	Fr	Vétérinaires Sans Frontières-Belgique/Veterinarians Without Borders-Belgium
WCS	En	Wildlife Conservation Society

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# Notes





*Cameroon Minister of Livestock, Fisheries and Animal Industries, HE Dr. Taïga, and the FAO representative in Cameroon, Mr. Mai Moussa Abari, meet with participants, Lilia Chauca-Francia and Ricardo Ordoñez-Noriega from Peru (photo: BecA-ILRI Hub/ Ethel Makila)*



*From left: Dr. Carlos Sere, Bioversity International, HE René Cremonese, Canadian High Commissioner in Cameroon, HE Dr. Taïga, Minister of Livestock, Fisheries and Animal Industries, Mr. Mai Moussa Abari, FAO Representative in Cameroon, Dr. Appolinaire Djikeng, BecA-ILRI Hub and Dr. Bruce Pengelly, Australia (photo: BL Maass)*