

## Nicaragua dual purpose cattle value chain impact pathways narrative

Michael M. Kidoido, Luke Korir and Rein Van der Hoek



[www.livestockfish.cgiar.org](http://www.livestockfish.cgiar.org)




November 2013

CGIAR is a global partnership that unites organizations engaged in research for a food secure future. The CGIAR Research Program on Livestock and Fish aims to increase the productivity of small-scale livestock and fish systems in sustainable ways, making meat, milk and fish more available and affordable across the developing world. The Program brings together four CGIAR Centers: the International Livestock Research Institute (ILRI) with a mandate on livestock; WorldFish with a mandate on aquaculture; the International Center for Tropical Agriculture (CIAT), which works on forages; and the International Center for Research in the Dry Areas (ICARDA), which works on small ruminants. <http://livestockfish.cgiar.org>

© 2013



This publication is licensed for use under the Creative Commons Attribution-Noncommercial-Share Alike 3.0 Unported Licence. To view this licence, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/>. Unless otherwise noted, you are free to copy, duplicate, or reproduce and distribute, display, or transmit any part of this publication or portions thereof without permission, and to make translations, adaptations, or other derivative works under the following conditions:

-  **ATTRIBUTION.** The work must be attributed, but not in any way that suggests endorsement by the publisher or the author(s).
-  **NON-COMMERCIAL.** This work may not be used for commercial purposes.
-  **SHARE ALIKE.** If this work is altered, transformed, or built upon, the resulting work must be distributed only under the same or similar license to this one.

ilri.org  
*better lives through livestock*  
ILRI is a member of the CGIAR Consortium

Box 30709, Nairobi 00100, Kenya  
Phone: +254 20 422 3000  
Fax: +254 20 422 3001  
Email: [ILRI-Kenya@cgiar.org](mailto:ILRI-Kenya@cgiar.org)

Box 5689, Addis Ababa, Ethiopia  
Phone: +251 11 617 2000  
Fax: +251 11 617 2001  
Email: [ILRI-Ethiopia@cgiar.org](mailto:ILRI-Ethiopia@cgiar.org)

## Problem statement

In Nicaragua, dairy and beef production is often the most important household income source. Several factors, however, limit the participation of small scale cattle farmers in cattle value chains. The quantity of milk produced by small scale farmers is usually low, characterized by high seasonal fluctuations in availability and prices, with markedly reduced production levels during the dry season, and often of poor quality. Income from beef production is low, with cash income mostly coming from selling steers at weaning age with hardly any value addition.

Several factors including the feeding systems being based on low quality feeds, lack of adequate on-farm infrastructure, inappropriate and unhygienic milking practices, low genetic livestock potential, and absence of collective investment in cooling systems on the farm and for transportation, are responsible. Cattle are usually sold or exported as live animals, and only about 40% to 50% of milk production is processed; with most small scale industries focusing on fresh cheese, cream, milk sweets and other dairy products for local consumption. Only the large scale plants produce Ultra Heat Treated (UHT) milk. Moreover, considerable volumes of milk are sold on-farm and consumed raw, particularly by low-income consumers. In addition, links of individual cattle farmers to associations, and ultimately to buyers, are often weak. This limits not only the flow of information on product quality, but also establishment of quality-based incentive systems that benefit both farmers and buyers. Most of the products traded are produced by many medium to low-scale processors and have minimal compliance with food safety standards. From the consumers' angle, access to high-quality, protein-rich food (like dairy products) is often limited for many households in both urban and rural areas. Lastly, livestock production has long been an important cause of natural habitat and biodiversity loss in the region.

# Value chain vision

The principle long term focus of the L&F CGIAR program in Nicaragua is to improve the competitiveness and incomes of small and medium cattle farmers in Nicaragua through creation and strengthening of sustainable dairy and beef value chains, to increase access to high-quality animal source products for poor consumers, and diversify products for national and regional markets.

The main anticipated impacts and outcomes are:

- Sustainable and competitive dual-purpose value chain in Nicaragua,
- Improved access to (niche) export markets,
- Improved access to dairy products for poor urban and rural households,
- Better household income and high asset ownership resulting from sustained intensification,
- Minimized negative environmental impacts.

More specifically, the program will aim at:

a) Improving farm/household/production by:

- Enhancing uptake of improved technologies including forages (grasses and legumes) adapted to drought and poorly drained soils, pasture management, silvopastoral systems and genetically improved cattle. It is assumed that farmers will implement improved innovations to increase productivity and apply sound resource management, leading to increased milk and beef production per animal. The focus will be on promoting better feeding strategies throughout the year and reducing productivity fluctuations between the wet and dry seasons.
- Improve beef and milk quality through better feeding, hygiene, and processing techniques.
- Improving income, particularly for women, through higher productivity and enhanced benefits of ecosystem services including carbon credit sales and certification.
- Improve farmers' competitiveness in the value chains.
- Increasing employment at processing plants and collection/distribution centres.

b) Increasing landscape/natural resource integrity through:

- Promoting better use of soils and ensuring higher biodiversity regeneration.
- Promoting high energy use efficiency and technologies leading to lower Green House Gas (GHG) emissions, with a particular focus on methane and nitrous oxide.
- Generation of evidence to promote the adoption of best practices for sustainable livestock farming and increase awareness among legislators, donor community, and the general public.

c) Improving the processing of dairy products through:

- Promotion of better application of quality and food safety standards.
- Improving relationships between value chain actors.

d) Improving the marketing of dairy products through:

- Enhancing diversification of production for supply niches and export markets.
  - Promotion of value addition through payment for ecosystem services including benefiting from carbon credits markets.
- e) Development of stronger institutions through:
- Enhancing stronger inter-institutional alliances, Research for Development (R4D) and innovation platforms, knowledge potential, and improved articulation with national and regional policies.
  - Building of formal linkages amongst different value chain actors.

## **Opportunities/assumptions**

- Dairy products are important dietary components for consumers from all social strata.
- Increasing per capita income and low per capita milk consumption levels in Nicaragua present great potential to increase consumption of higher quality processed dairy products.
- Improving overall performance of the value chain provides a unique opportunity to improve income generation across the value chain, while enhancing product quality for consumers.
- Increased focus on exporter certification and enforcement by regional importers (for instance El Salvador and Mexico) offers a good incentive to farmers and processors to improve and uphold quality standards.
- The regional market of the Caribbean Basin countries constituting an estimated population of about 150 million consumers is a key driver of the dual purpose cattle value chain development.
- High-quality raw milk is the basic input for a large variety of higher value dairy products that can be profitably produced with local identity (for instance cheese).
- Improved and well-managed pasture and silvo-pastoral systems are attractive economic and environmental alternatives, especially due to their Carbon accumulation potential and capacity to recover degraded areas.
- Payment for ecosystem/environmental services (PES) offer good potential of compensation and rewards from different final users at local, national and global levels.
- The private sector is increasingly aware of the potential of measures such as carbon credit purchases and direct interventions in their supply chains.
- Capital and knowledge aimed at small producers and industry enterprises to increase competitiveness and to improve productivity and added value will be available.
- Compensation schemes based on carbon credits and other ecosystem services have the potential to improve farmer livelihoods.

## **Key risks**

- Insufficient resources available to enhance value chains for instance the lack of appropriate credit products, or low farmer accessibility of inputs like improved seed due to high prices.

- Extreme weather events given that we are focusing on locations where a significant number of the poor are vulnerable to environmental shocks.
- Government distortional investments aimed to increase production and improve farms.
- Increased supply of high value products that may not be consumed by rural and urban low income earners.
- Sustained increase in productivity might be achieved at the expense of natural resource integrity.
- Weak enforcement of government policies aimed at sustainable agriculture.
- Dysfunctional incentive mechanisms for farmers to adopt best practices.

# Nicaragua dual purpose impact pathways

We identify four main pathways to impact for the livestock and fish CGIAR program in the dual purpose cattle value chain (Figures 1-4):

1. Strategies to increase production and consumption of quality beef and dairy products.
2. Sustainable access to pasture, forages, seed and genetic materials.
3. Institutional arrangements for increased value chain coordination and performance.
4. Promotion of eco-friendly beef and dairy production practices.

Most activities embedded in these pathways will be implemented in close collaboration with the Ministry of Agriculture and Livestock (MAGFOR), the agricultural research and extension institute (INTA), NGOs, farmers' associations (such as cooperatives), and private sector. Strong links will be established with existing initiatives in the region, including:

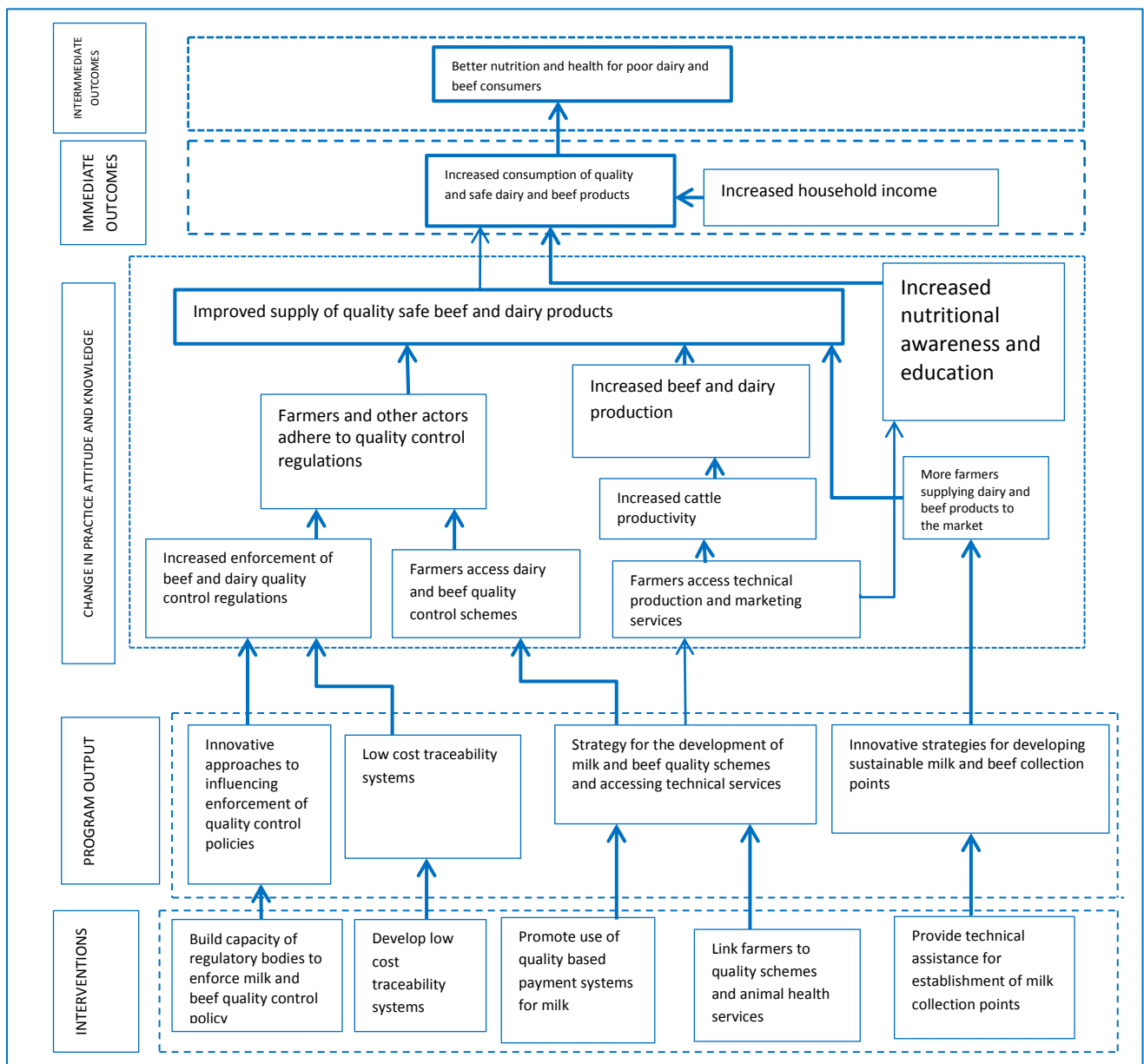
- PROGRESA: implemented by Catholic Relief Services (CRS), financed by US Department of Agriculture (USDA), and aiming to improve productivity (including implementing Best Livestock Practices) and with a strong value chain component.
- SNV biogas project, aimed at generating energy for consumption and production purposes (including the cooling of milk to increase quality), and producing high-quality organic fertilizer.
- CGIAR Research Program on Humid tropics, aimed at sustainable intensification of crop-livestock systems having a very strong focus on R4D and Innovation platforms.
- Inter-American Development Bank (IDB): aimed at improving productivity of livestock and basic grains in Nicaragua. The project is implemented by the Ministry of Agriculture (MAGFOR) and the National Agricultural Research and Extension Institute (INTA)

## **Strategies to increase production and consumption of quality beef and dairy products**

The first impact pathway involves increasing production and consumption of quality beef and dairy products which ultimately leads to better nutrition and health status of consumers, particularly poor consumers. Several strategies are envisaged. First, development of innovative approaches to influence enforcement of dairy and beef quality control policies and developing low cost traceability systems, will enhance stricter adherence to quality control regulations and eventually lead to higher quality beef and dairy products supplied to the market. Second, enhancing the development of milk and beef quality schemes and farmers' increased access to technical services will not only enable farmers to access quality control schemes and adhere to quality control regulations but will also lead to increased access technical production and marketing services. Farmers' increased access to production and marketing services will lead to increased productivity, increased production, and to increased supply of high quality dairy and beef products. Besides, as farmers

improve their access to technical services, they will increase their nutritional awareness which will further drive significant changes in household nutrition and health status. Last, developing innovative strategies for emergence of sustainable milk and beef collection points will enable more farmers to participate in formal markets and thereby lead to overall increased milk and beef supply in the markets. Key actor in this pathway will include: municipal governments, collection centres, transporters and input suppliers.

**Figure 1: Strategies to increase production and consumption of quality beef and dairy products.**

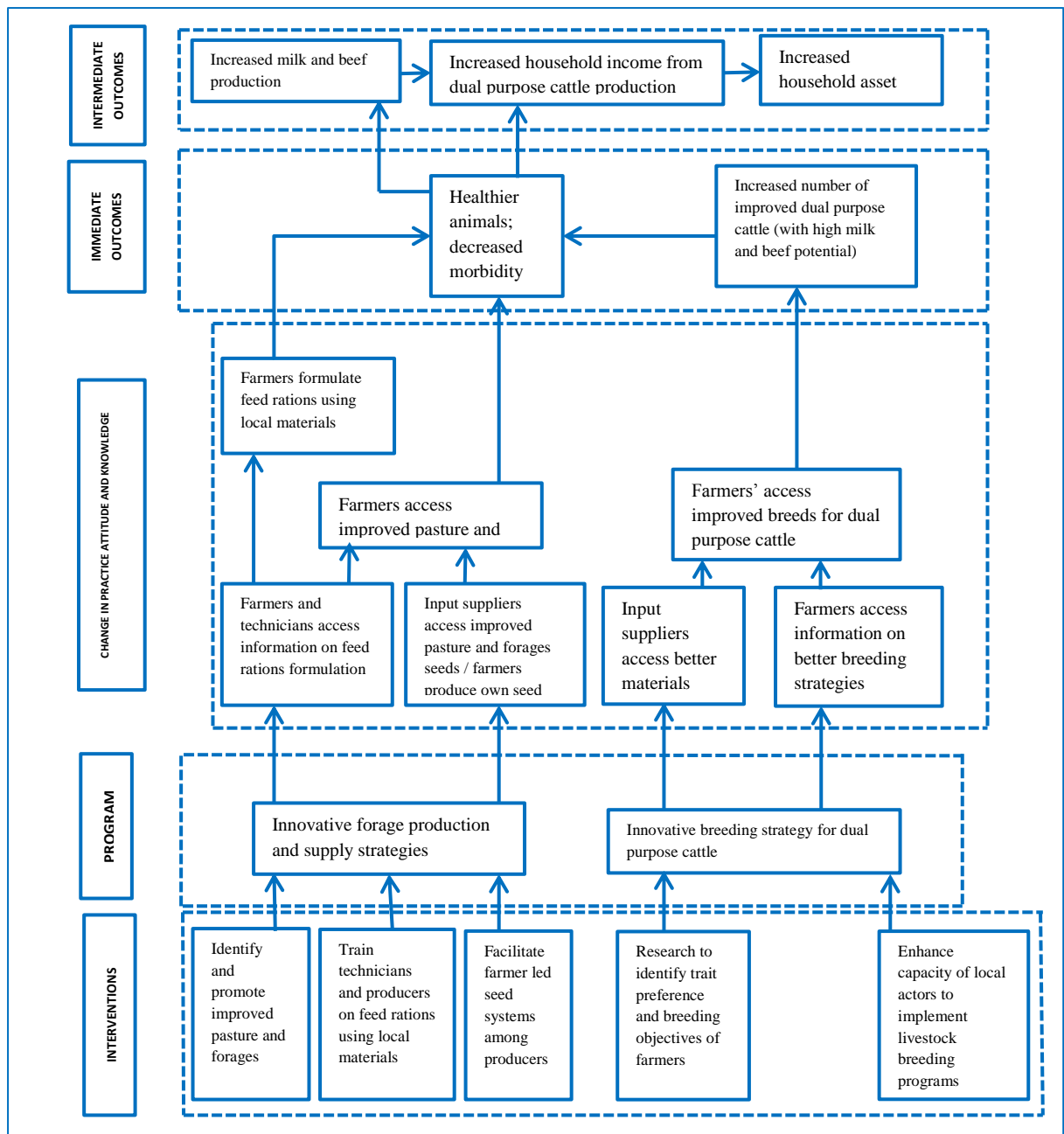




## **Sustainable access to pasture, forages, seed and genetic materials**

The second impact pathway entails ensuring farmers' sustainable access to pastures, forages and genetic materials. Its envisaged ultimate outcomes to include increased milk and beef production, increased household income from dual purpose cattle production, and increased household asset ownership. By facilitating the development of innovative forage production and supply strategies, the livestock and fish program will enable farmers and technicians to access information regarding feed ration formulation, especially from locally sourced ingredients, input suppliers and farmers to access improved pasture and forage seeds, which should eventually lead to farmers keeping healthier and more productive animals. Similarly, developing innovative breeding strategies for dual purpose cattle will lead to two major changes in knowledge attitudes and practices. First, input suppliers and farmers will access better and improved genetic material and then farmers will acquire better breeding information and knowledge. Both of these changes will become important to farmers' increased access to improved dual purpose breeds which will translate into increased ownership of dairy and beef cattle with high productive potential.

**Figure 2: Sustainable access to pasture, forages, seed and genetic materials**

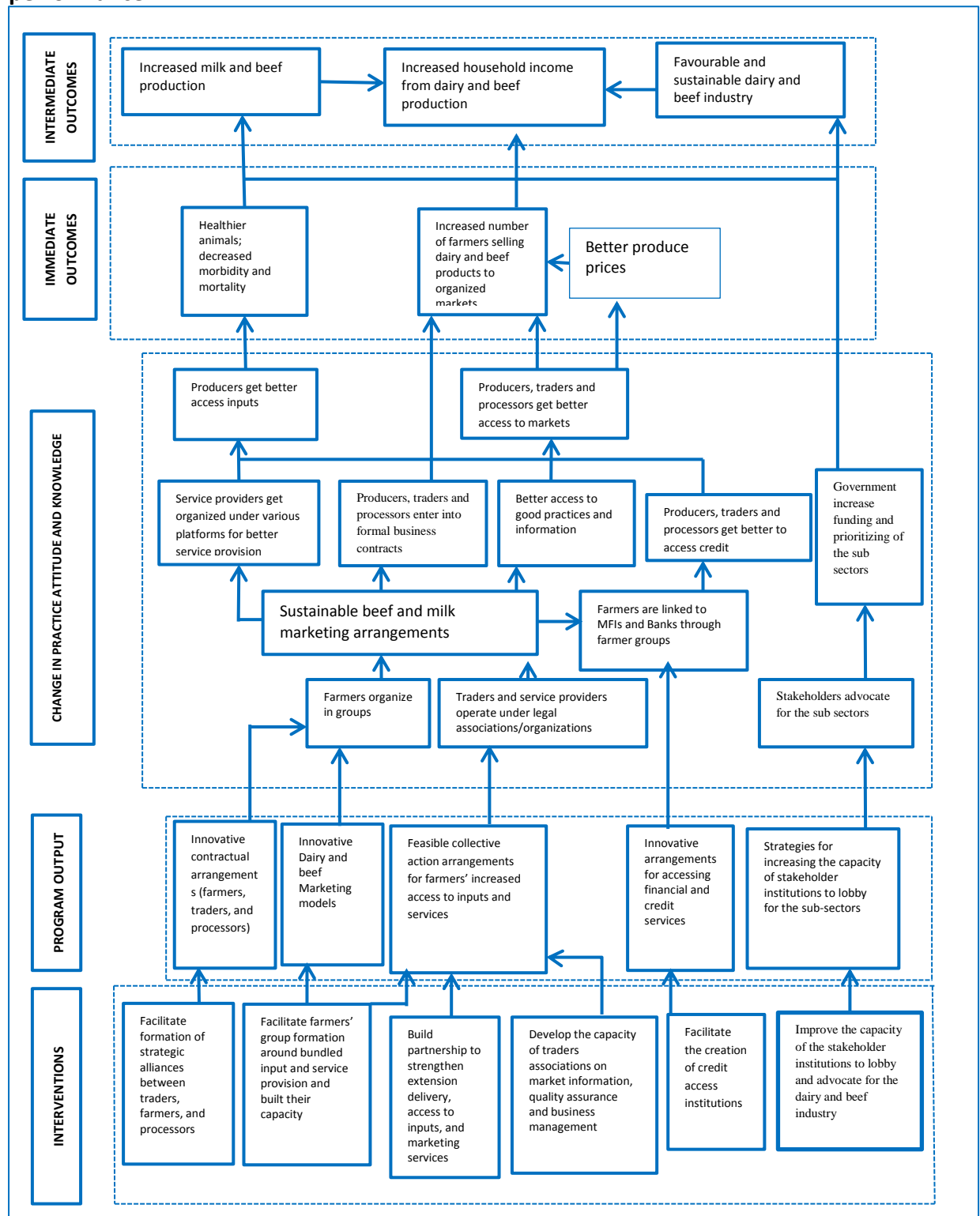


## Institutional arrangements for increased value chain coordination and performance

The third impact pathway will involve the design of innovative institutional arrangements to improve overall value chain coordination and performance. It is envisaged that increase in milk and beef production, increase in household income from these two products and the overall improvement in Nicaragua beef and dairy sectors will be the ultimate outcomes. However, central to this impact pathway will be the development of sustainable beef and milk marketing arrangements through farmers organizing in groups and traders and services providers operating as legal associations/ organizations. These will emerge from having innovative contractual arrangements between actors, development of innovative marketing models, and

existence of innovative models for farmers' increased access to inputs and services. Intermediate results of these arrangements will include service providers getting organized under various multi stakeholder (platforms that will not only include farmer organisations and the private sector, but also government agencies, NGOs, Agricultural research institutes, universities), and producers enjoying better access to inputs and services; producers, traders and processors entering formal business agreements and eventually allowing more farmers to access formal and organized markets; and value chain actors accessing credit services through MFIs and banks linked to these associations. The second route will involve the development of feasible arrangements to increase value chain actors' access to finance and credit services. Once these are fully developed, actor associations/ groups will be linked to them for easy access to services. Lastly, through developing strategies to increase the capacity of stakeholder institutions to lobby for the cattle subsector, stakeholders will actively advocate for government's increased prioritization of the beef and dairy sub-sectors. Enhanced prioritization of these sub-sectors will be an important precursor of creating an enabling environment for increased investment in the sectors.

**Figure 3: Institutional arrangements for increased value chain coordination and performance**



## **Promotion of eco-friendly beef and dairy production practices.**

The last pathway focuses on promoting the use of eco-friendly and superior innovations. The pathway ultimately leads to reduced household poverty levels, improved nutrition and health, and increased natural resources integrity. The program will therefore focus on: 1) enhancing the development and adoption of technologies and good practices and 2) enhancing the development of strategies to promote market based incentive mechanisms to manage natural resources. The first major entry point will involve NGOs and private organizations promoting: improved dairy and beef value addition technologies and the use of biogas and farmers co-learning production innovations. It is presumed that there will be improved uptake of improved innovations, leading to improved productivity without necessarily compromising the integrity of natural resources, higher production of beef and dairy products and eventually increased income and consumption of dairy and beef products. The second strategy will involve the promotion of and use of carbon credits and other payment for ecosystem services schemes, then to high biodiversity and better status of natural resources. The ultimate outcome will be reduced emissions of Green House Gases (GHG) in the program focal areas.

**Figure 4: Promotion of eco-friendly beef and dairy production practices**

