Nasreen Sultana • George Chandra Babu • Disna Rathnasinghe

Regional Training on Safe and Sustainable Vegetables Value Chain Development in South Asia

SAC

SAARC TRAINING MANUAL

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28 July-1 August 2019, Sri Lanka

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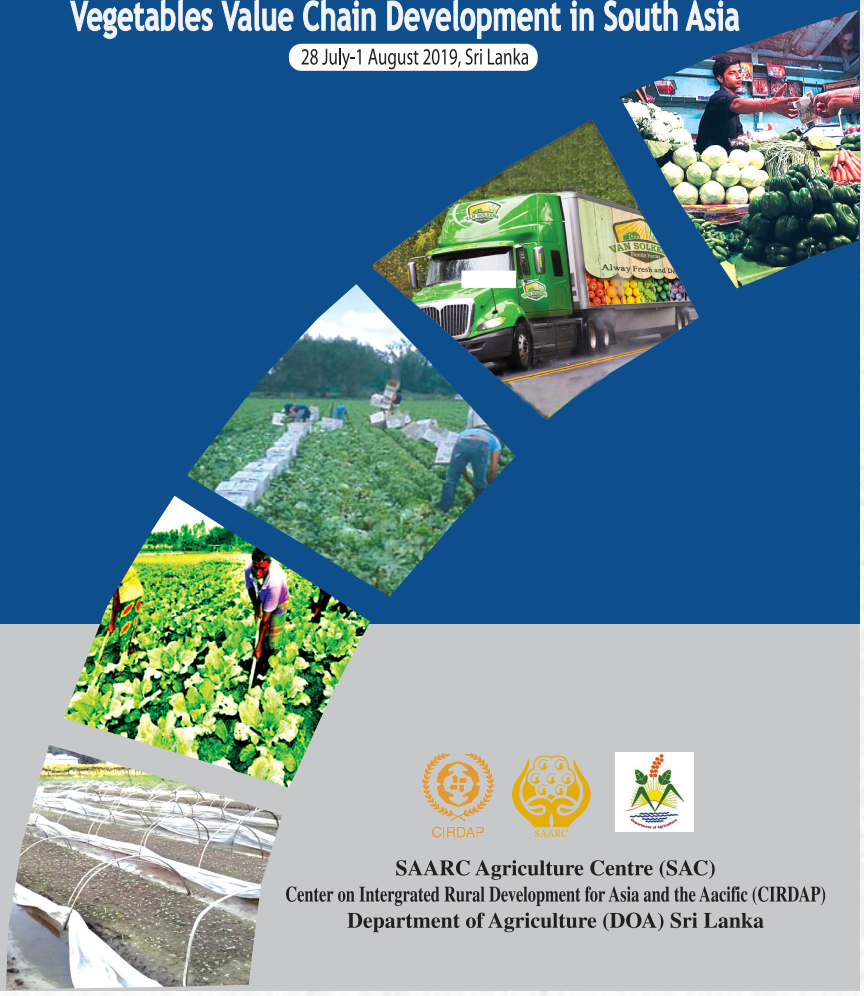

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Md. Younus Ali
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SAARC

Director
SAARC Agriculture Centre (SAC)

FOREWORD

Agricultural Value Chain is all about businesses- wherever they operate in relation to the end market, leveraging their combined competencies and strengths to more effectively and efficiently supply consumers in a rapidly evolving business environment. Global food markets are undergoing significant changes over time. Similarly, South Asian Countries experience population growth, rising incomes and rapid urbanization- all of which trigger demand for safe and nutritious foods. In response to increasing demand for health foods, vegetables trade has also increased in developing countries and consequently new opportunities have also opened in developing countries. .Moreover, as the cultivation of vegetables is substantially labor-intensive and offers more post-harvest opportunities to add value, considerable new employment opportunities have been created in developing countries.

South Asian Countries are facing extraordinary challenges to develop a sustainable food and agricultural system. Particular attention is required to enhance people's access to income-generating activities and food which ultimately depends on the creation of sustainable income source, increasing safe food supply, and maintaining affordable food prices. Increased research and development (R&D) investments offer the possibilities to enhance the quantity and quality of agricultural outputs, increased income sources, greater food security, and better nutrition. Regional integration and free trade is one of the most important building blocks for economic growth of a region. Our ultimate objective is to strengthen the process of transformation of subsistence vegetables sector to commercial agriculture through facilitating value chain approaches, and to strengthen regional and international trade.

I wish all your successful completion of this program and that you can implement the learning in your home countries. I am sure that this manual would be of benefit to SAARC Countries and will serve as a reference for carrying vegetables value chain development training in your respective countries. I would also like to avail this opportunity to express my sincerest gratitude to the Director General, Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) for his direct involvement in implementing the training program successfully. I also would like to extend my sincere thanks to the Director General, Department of Agriculture (DoA), Sri Lanka for his support and guidance to conduct this training program effectively.

Wish you all the best!

Dr. S. M. Bokhtiar

Director General
Centre on Integrated Rural Development
for Asia and the Pacific.

Message

The Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) is a regional inter-governmental and autonomous organization. It plays a supplementary and reinforcing role in supporting and furthering the effectiveness of integrated rural development programmes in Asia and the Pacific.

It gives me an immense pleasure that we collaborated with SAARC Agriculture Centre (SAC) and Department of Agriculture, Sri Lanka in organising safe and sustainable vegetables value chain development in South Asia from 28th July to 1st August 2019 at Department of Agriculture (DoA) Sri Lanka. This collaboration is concluded with the publication of this training manual on "Safe and Sustainable Vegetables Value Chain Development in South Asia".

In south Asian Region conswumption of high value agricultural products is rapidly rising. This type of shift in consumption pattern will have profound impact on agricultural production, marketing, processing and retailing environment. To some extent, it has implications on the production of common and traditional vegetables in South Asia is steadily increasing and traditional vegetables in particular are attracting the attention of farmers, researchers, policy makers and the public.

Vegetables production plays an important role in rural livelihood of subsistence farmers in the region. However, agriculture sector, particularly vegetables production has been facing challenges in terms of losses, wastage and overall impact on the environment. Even though, South Asian Region is producing sufficient quantities of vegetables a substantial amount is wasted before it reach consumers. In this context value chain plays an important role especially for small scale growers.I am sure that the contents of the manual is certainly a wealth of information related to advance research and experience on value chain development. The Manual has its unique characteristic and a stock of knowledge on Safe and Sustainable Value Chain Development for Vegetables and no doubt of its usefulness for those who have interest in developing value chain.

I wish all the great success for this regional training and its accomplishments.

Tevita G BoseiwaqaTaginavulau

Director General of Agriculture
Department of Agriculture
Sri Lanka

Message

It is a great pleasure to write this message for the "Regional Training on Safe and Sustainable Vegetables Value Chain (VC) development in South Asia " in Kandy, Sri Lanka, jointly organized by the Department of Agriculture, Sri Lanka in collaboration with SAARC Agriculture Centre (SAC) and CIRDAP with the participation of all SAARC Member Countries.

South Asia is one of the fastest growing regions in the world and Agriculture plays a significant role in the economy of SAARC Member Countries. However, Agricultural marketing situations in the region is facing varied challenge

s due to high cost of production owing to inefficient use of inputs and high labor cost, seasonality of production, high post-harvest losses, poor transportation, storage and infrastructure facilities, insufficient value addition and processing etc. These factors affect unfavorably to the internal and foreign trade of agricultural produce.

VC is a series of primary and supporting activities that connect the suppliers to the consumer, while adding value to products and services. Characters of vegetables value chain are specific due to its own features such as their perishable nature, short shelf life, high and continuous demand, nutritional importance, food safety issues, processing potential, etc. Understanding and analysis of different existing value chains will be helpful to identify the present drawbacks and challenges in the system, while identifying the relationships between stakeholders and understanding the ways to strengthen the current value chains. Developing VC will improve the quality, variety and safety of the product that reaches the final consumer while ensuring efficient flow of goods and benefitting all the other stakeholders in the chain.

The VC approach is a powerful tool for policy makers, private sector, decision makers and donors as well. This training is targeted to develop a set of trained manpower to handle vegetables value chain in each member country. I hope the participants representing different disciplines in SAARC Member Countries would acquire knowledge and achieve required expertise after the training.

I acknowledge SAC and CIRDAP for selecting this timely topic and for selecting Sri Lanka as the host country. Best of luck to all the participants and I hope this program will further enhance your skills and knowledge in this field.

Dr.W.M.W.Weerakoon
Director General of Agriculture
Department of Agriculture, Sri Lanka

Contents

Session 1

Understanding the Concept and Guiding Principles of Vegetables Value Chain

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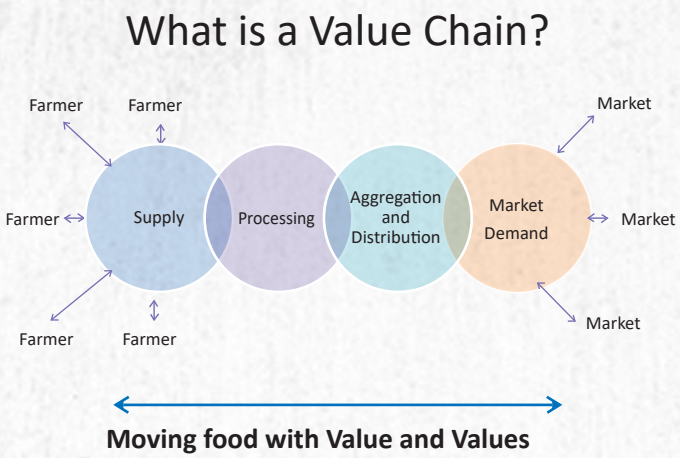
Introduction

(i). The Value Chain

- Michael Porter, in 1985, first developed the value chain as a business idea and defined as "A systematic way of examining all the activities, a firm performs and how they interact, is necessary for analyzing the sources of competitive advantage."
- Porter analyzed value chains, the activities within and around a firm, but focused on the analysis of the competitiveness of a particular firm.

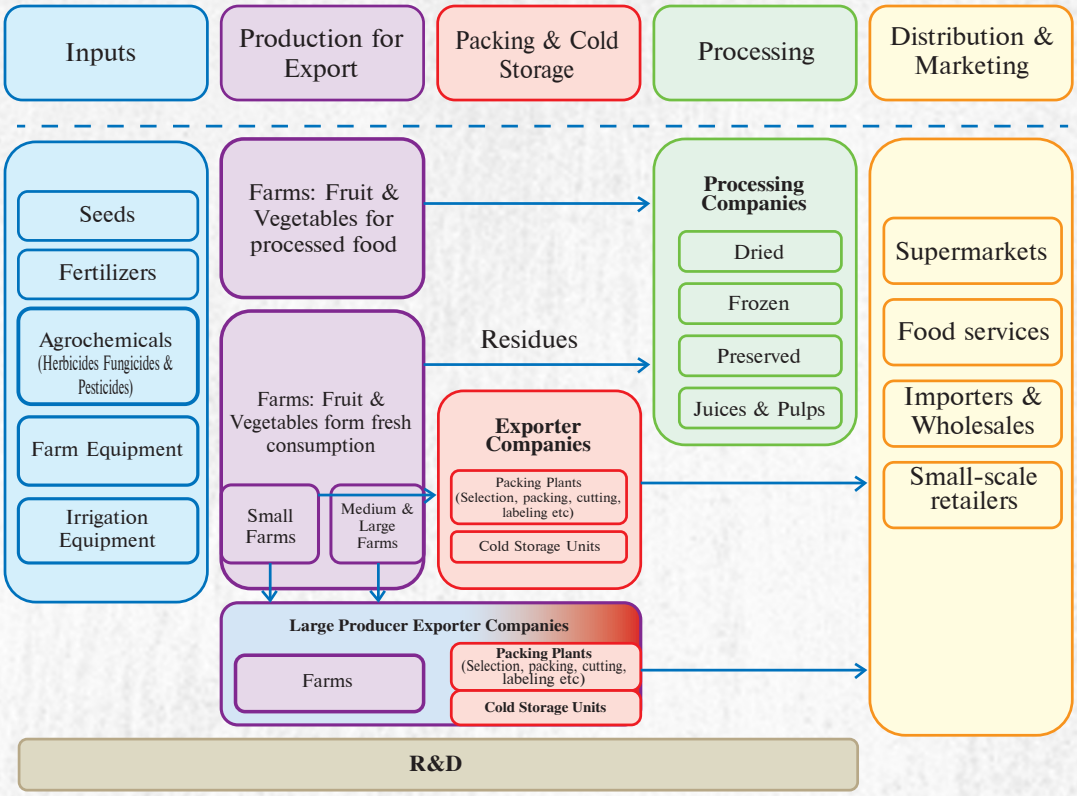
(ii). Agricultural Value Chain



- Concepts and Analytical tools for analyzing the functioning of agricultural value chains are important to understand the impact of chain development interventions on smallholders and the rural poor.
- In a value chain marketing system, farmers are linked to consumers' needs, working closely with suppliers and processors to produce the specific goods that the consumers demand.
- Similarly, through flows of information and products, consumers are linked to the needs of farmers.

(iii). Defining a Sustainable Vegetables Value Chain

- The full range of vegetables farms and their successive coordinated value-adding activities that produce particular raw vegetables products and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad-based benefits for society, and does not permanently deplete natural resources. The "full range of farms and firms" refers to both Value Chain actors who take direct ownership of the product and various business service providers (e.g. banks, transporters, extension agents, input dealers and processors who charge a fee).
- Value Chain actors' behavior and performance is strongly influenced by the particular business environment in which they operate.
  - The term "coordinated" here means that in VCs the governance structure moves beyond a series of traditional spot-market (If the operation is of daily nature, it is called spot market or current market) transactions, with some level of non-adversarial vertical coordination in at least some part of the chain.
  - Vertical coordination is the coordination between different levels of the organization to ensure that all levels of organization are in harmony with the organizational policies and programs. This is achieved through delegation of authority by directing and by controlling. The concept of value added is central in both the definition used in this publication and the development model the author presents.
- Value can be added to an intermediate agri-food product not only by processing it, but also **by storing it (value increasing over time)** and **by transporting it** *(*value increasing over space*), **by*** **sorting it** (value increasing over operations).
- A **'Value Chain' in Agriculture** identifies the set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product.
- A value chain can be a vertical linking or a network between various independent business organizations and can involve processing, packaging, storage, transport and distribution.
- **Traditional Agricultural Value Chains** are generally governed through spot market transactions involving a large number of small retailers and producers.
- **Modern Value Chains** are characterized by vertical coordination, consolidation of the supply base, agro-industrial processing and use of standards throughout the chain.



a) Expanded Vegetable Value Chain

(iv). Principles of Sustainable Vegetable Value Chain Development (VVCD)

Measuring performance

- Economically sustainable (profitable)
- Socially sustainable (inclusive)
- Environmentally sustainable (green)

a) Measuring performance of Vegetable value chains

- The first three principles underpinning VVCD relate to measuring VC performance from the perspective of the triple bottom line: economic, social and environmental sustainability.
- These are three distinct dimensions that have a natural order in terms of timing and priority:
- In terms of economic sustainability (competitiveness, commercial viability, growth), the upgraded VC model should provide greater (or at least not reduced) profits or incomes relative to the status quo for each stakeholder, and these should be sustained over time. Unless all stakeholders along the VC benefit, the model will not be sustainable even in the short term.

- In terms of social sustainability (inclusiveness, equitability, social norms, social institutions and organizations), the upgraded VC model should generate additional value (additional profits and wage incomes in particular) that benefits sufficiently large numbers of poor households, is equitably distributed along the chain (in proportion to the added value created) and has no impacts that would be socially unacceptable.
- That is, every stakeholder (farmers and processors, young and old, women and men etc.) should feel they receive their fair share (win–win), and there are no socially objectionable practices such as unhealthy work conditions, child laborand mistreatment of animals or violations of strong cultural traditions. Unless this is the case, the model will not be sustainable in the medium term.
- In terms of environmental sustainability, the upgraded VC model should create additional value without permanently depleting natural resources (water, soil, air, flora, fauna etc.). If this is not the case, the model will not be sustainable in the long term.

b) Understanding Vegetable Value Chain Performance

- Value chain development starts from the premise that a VC is a system in which everything –every activity, every actor – is directly or indirectly linked. VC mapping is typically an essential part of the analysis of VC performance because we must understand the VC holistically in order to understand its performance.
- The VC does not operate in isolation; it is actually a subsystem that is linked to other subsystems in an overall system. An agri-food VC is linked to and influenced by market systems, the political system, the natural environment, farming systems, infrastructural systems, legal and regulatory systems, the financial system, global trade systems, social systems and many other subsystems.

Example: The Vegetables Value Chain in the Philippines

- This case illustrates, at the level of a more narrowly defined value chain (VC), how taking a dynamic systems perspective allowed the stakeholders to find the most critical bottlenecks and leverage points at each successive stage of the development of the VC.
- As in many other countries, rapidly expanding supermarkets have been a key driver of change in vegetables value chains in the Philippines. The Northern Mindanao Vegetable Producers Association, or NorMinVeggies, is a new type of market facilitator that functioned as a leverage point for sustainably linking smallholder growers to these new retailers and other demanding markets.
- With the assistance of the United States Agency for International Development (USAID) and FAO, it has done so by identifying and addressing sets of critical constraints as they emerged.
- **Aggregation, Capital and Knowledge Constraints**: NorMinVeggies was set up in

1999 by a group of determined famers. The unique feature of the association is that it consists of two distinct but well-integrated types of farms: tiny family-operated farms with little capital investment and (mostly still) small-scale farms operated by independent part-time growers with some access to capital and technology. Combining both types of farms in crop based marketing clusters for at least 12 different vegetables allowed family farmers to learn from independent farmers and the latter to benefit from increased aggregated volumes.

- **Quality Constraint**: Over the years, to meet the increasingly demanding requirements of buyers, NorMinVeggies introduced quality assurance schemes, production schedules and traceability systems. These are rigorously followed by all members, with designated lead farmers act as coaches and quality managers. The system is transparent and the responsibility for delivering quality and the benefits derived from this are shared equally among members. Individually, small family farms would not have been able to meet market requirements and post-harvest losses would have been far greater (up to 25 percent).
- **Logistics constraints**: In 2006, NorMinVeggies established a consolidation centre to improve its efficiency. This centre created a leverage point not just for marketing but also for the procurement of inputs and services. The same year also saw a shift from bags to plastic crates for handling the produce, forcing other traders to follow suit. The cost of the overall system, i.e. the operational and managerial cost for the delivery of these various services to its members, is entirely covered by the value-based fees (of 2–5 percent) that members are charged, thus making the model commercially viable
- **Market constraints**: To avoid market dependencies, NorMinVeggies leveraged its larger volumes and reliable quality to bypass various layers of traditional middlemen and engage directly with a range of markets, including supermarkets, hotels, fast food chains and export, as well as traditional local and wholesale markets.
- Each of these markets has different requirements, necessitating constant adaptation to a changing market environment, but also allowing NorMinVeggies to sell a range of quality grades to a range of markets
- Over time, NorMinVeggies expanded its membership, output and range of markets. Its membership gradually increased from 15 in 1999 to 178 in 2011 and now includes individual farmers, cooperatives, foundations and growers' associations. Overall, a total of some 5 000 farmers are involved in the scheme.
- The system's efficiency allowed for both higher farmgate prices and lower retail prices, thus creating additional net income for farmers and increased benefits for consumers.

Improving Food Value Chain Performance – Design Principles

- The first six principles describe VC performance largely in general terms. The next four principles guide the process by which a clear and detailed understanding of the current performance of the food chain can be translated into effective and efficient

programs that support or facilitate VC development. This processis arranged in three phases:

1. setting clear goals (vision) and developing an approach to achieving the goal (core)
2. developing an action plan for technical, institutional and/or organizational upgrading of the VC
3. designing and implementing a monitoring and evaluation system that continuously tracks performance against the vision and that allows for adaptations where and when necessary.

Vegetables Value Chain is guided by 4 types of production

- Producer driven
- Buyer driven
- Facilitator driven
- Integrated

Producer driven

- Producers driven model works on the rationale of reaping the economies of scale and bargaining power for higher price.
- Since small scale producers are always at the receiving end in the marketing system, it is in their interest to join hands with other farmers to market the bulk quantity.

  This model invariably leads to the formation of some kind of producers' association (co-operative or producers' company), where the association becomes the driver for VC promotion and its development. The association provides technical assistance, marketing, inputs and linkage to finance. Although, producers' driven models act in the best interest for the small farmers, some major limitations and challenges identified are:

  - Lack of understanding of the producers about the market.
  - Producers lack the organizational skills.
  - Producers may lack technical and financial resources to produce the high quality and quantity required in the market.

Buyer driven

- The buyers' interest to procure a certain flow of product is the basic foundation of the buyer driven model of VVC.
- Finance is used to get the commitment of the producers to sell the required quantity and quality of the agricultural commodity at the appropriate time, in an affordable cost price.
- This is achieved through developing suitable contracts between buyer and seller. Contract farming is the most common buyer driven VC model in vegetable commodities.

- However, contract farming is also plagued with a serious problem of side-selling by farmers, if the prices in the alternative market shoot up drastically.
- Besides, the farmers are dependent on a single buyer who may later on become monopolistic or may lose the interest in the relationship with the farmers.

Facilitator driven models

- The basis of the facilitator driven models is that development agencies (government or non-government) have a social mandate and can provide the required support to promote VCs integrating small farmers and agro-enterprises.

The other important factors taken into consideration are:

Understanding performance

- Dynamic systems based
- Governance-centred
- End-market driven

Improving performance

- Vision/strategy driven
- Upgrading focused
- Scalable
- Multilateral

Session 2

Application of Project Management Principles for Stakeholder Management

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This is the process designed to identify, analyze and develop strategies to improve the relationship with the various project stakeholders; this is one of the subjects most often misinterpreted and misunderstood in development projects.

Stakeholder Definition

> Project stakeholders are the groups or individuals whose interests are impacted positively or negatively by the project or whose interests can impact the project.

Stakeholder management is not about managing and making the stakeholders do as the project wants, but *understanding the needs, issues and motivations of the various project stakeholders and develop different strategies to win the acceptance or negotiate agreements to gain their support*.

From this definition one can see that there are many stakeholders, all with different attitudes, levels of interest and support that bear an influence on the project.

Project stakeholders include:

- Beneficiaries of project interventions
- Partner organizations (Govt./NGOs or both)
- Donor organizations and individuals that contribute funds, goods or services
- Project staff and volunteers
- Regulatory bodies (national/international)
- Local authorities, national and local government
- Media and the general public
- Social, political and religious entities

Stakeholder Analysis Matrix

Information on each stakeholder is captured on a matrix that identifies their position relevant to their **influence**, **interest** and their **level of understanding** and *commitment* to the project. Here we present the five steps to develop a Stakeholder Analysis Matrix:

1. Identify all the people, groups, and institutions that will affect or be affected by the project (list them in the column under "**Stakeholder**.")

2. For each stakeholder, identify their level of influence on the project (on the column labeled "**Influence**" as *high, medium* or *low*);
3. Describe the type of influence they have on the project.
4. For each stakeholder, identify their level of interests, involvement or commitment on the project (on the column labeled "**Interest**" as *high*, *medium* or *low*).
5. Describe the type of influence they have on the project.

Stakeholder Matrix

Information above can be visualized on a Stakeholder Matrix that contains 4 quadrants by the *level on influence* and the *level of interest*.

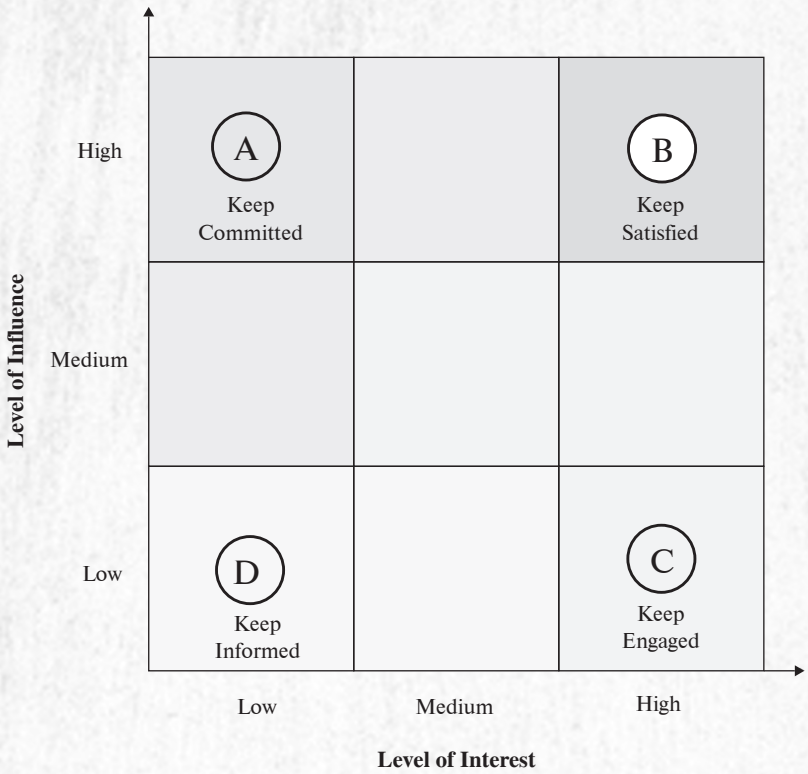

Figure 1. Stakeholder Matrix

Category A: "Keep Committed"

This group is made of stakeholders that have *large influence but low interest* in the project. The goal is to work to build more positive interest in the project, especially from stakeholders that provide resources to the project.

This is a *relationship that needs to be managed closely* to avoid changes in the perceptions of the project, especially when stakeholders can have a significant impact on the project.

This is the group of stakeholders the *project needs to pay close attention and monitor their interest and influence on the project*.

The project needs to build more commitment from stakeholders with high influence but low interest, but who can have a high impact to the project.

Category B: "Keep Satisfied"

Stakeholders that belong to this group need to be kept satisfied so that their interest is sustained to take advantage of their influence.

Failure to do this can results in stakeholders losing interest or changing from positive interest to a negative interest and due to the high level of influence the results can be significant to the project.

It is a good strategy *to build partnerships with this group to solidify the relationships* and *ensure the project objectives are in line with the objectives of these stakeholders.*

Category C: "Keep Engaged"

This group's level of impact to the project is medium and needs occasional monitoring. Stakeholders with *low influence and high interest* belong to this group.

A good strategy to *maintain the level of interest is to engage the stakeholders by increase the level of direct communication*, but there is little the project can do to increase influence.

Category D: "Keep Informed"

Interest and Influence are low, the project should pay little attention; stakeholders with low influence and low interest belong to this group. Best approach is to *keep this group informed*.

Stakeholder Map

Another method to visualize stakeholder's interest and influence on a project makes use of circles to representing the project and circles representing stakeholders, the size of the circle identifies their influence while the proximity identifies their interest. Color is a third criterion that identifies the impact to the project.

For example, a project may have it beneficiaries relatively interested in the project, with large influence while other stakeholders such as the local interest groups may have large influence but they have a low interest on the project. The diagram below is an example of how a project could map the different stakeholders and capture the information of influence, interest and impact on the project.

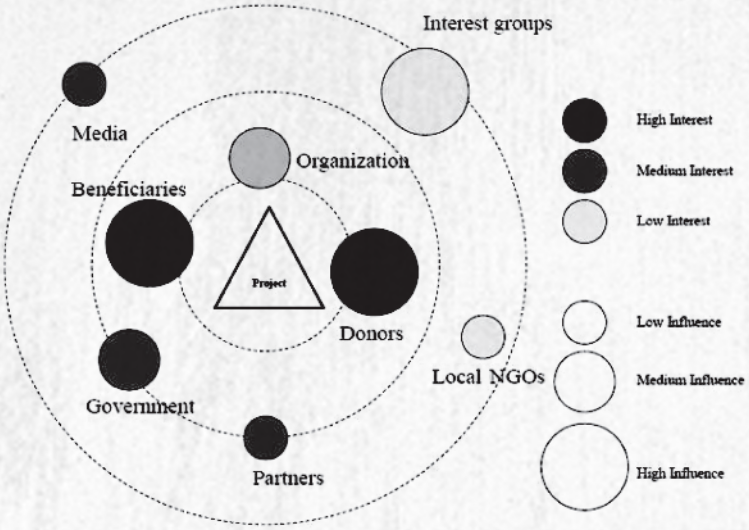

Figure 2. Stakeholder Map

Graphic Support: Mastering Project Management (ISBN 978-0-557-28868-7)

Published by: Project Management for Development, 1201, Peachtree St. Suite 622, Atlanta, GA 30362

Session 3

Safe and SustainableVegetables Productionin Urbanand Peri-urban Areas

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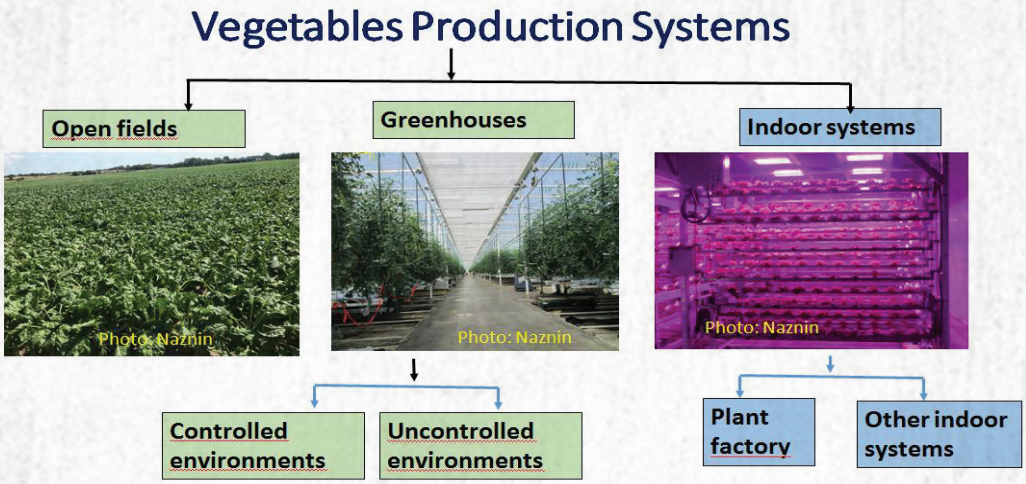
Vegetables

- Vegetables are essential nutrients of the human healthy diet. As well as intake of vegetables have been strongly associated with reduced risk of diseases (Bowen and Beresford, 2002[1]).
- Vegetables are rich source of health beneficial micro-nutrients, phytochemicals and antioxidants.
- Vegetables production in urban and peri-urban areas creates new jobs, promote agribusiness, thereby creating economic opportunities

Sustainable Vegetables Production

- Sustainable vegetables production is expected to meet the present demand and the demand of the future as well.
- Sustainable vegetables production enrich quality of crops, environment, biodiversity, economy and society (Imadi et al. 2016[2]).



[1] Bowen, D. J. and Beresford, S .A. A. (2002). Dietary interventions to prevent disease. AnnualReview of Public Health. 23(1), 255–286.

[2] Imadi S.R., Shazadi K., Gul A., Hakeem K.R. (2016). Sustainable Crop Production System. In: Hakeem K., Akhtar M., Abdullah S. (eds) Plant, Soil and Microbes. Springer, Cham.

Open Field: Soil Culture

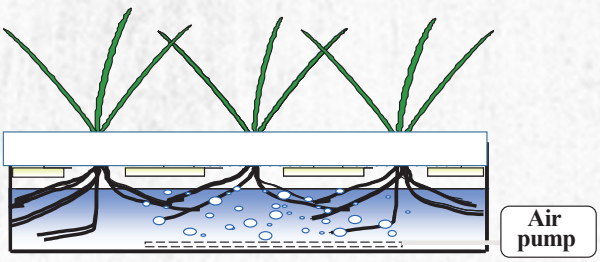
Following aspect should be considered:

- Suitable and well adapted cultivars: Healthy vigorous high quality seed/seedlings of Improved Varieties cultivars
- Soil fertility/soil loss: Minimum tillage, crop rotation, intercropping, cover crop, green manure
- Water: Appropriate irrigation and good drainage
- Fertilizer: Organic fertilizer, accurate amount of synthetic fertilizer
- Plant protection methods: IPM, Biological control, environmentally friendly and effective plant protection technique.
- Harvest: Optimal time, good technique
- Good post-harvest technology

Greenhouse and Indoor Farming Systems: Hydroponic Culture

Deep Water Culture (DWC)

- In this system, no substrate is used (Jones andBenton,1997[3]). Although plants may be grown in rockwool, most of the roots are growing in a nutrient solution.



Source: Naznin et al., 2010[4]

Nutrient Film Technique (NFT)

- Nutrient Film Technique (**NFT**) is a hydroponic technique where in a very shallow stream of water containing all the dissolved nutrients required for plant growth is re-circulated past the bare roots of plants in a watertight gully or tube.
- A pump raises the nutrient solution to desired levels, and gravity allows it to drain.
- Total tube length should not exceed 100 feet in order to provide sufficient oxygenation.

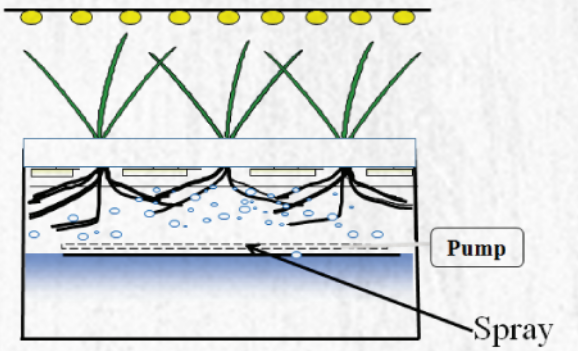
[3] Jones, J. Benton, J. (1997). Hydroponics. St. Lucie Press, Boca Raton, Fla.

[4] Naznin, M. T., Kitaya, Y., Shibuya, T. and Hirai, H. (2010). Growth and ajoene concentrations of garlic plants cultured hydroponically with different aeration regimes. Journal of Horticultural Sciences & Biotechnology. 85 (2), 161-165.

Aeroponics

It is another type of water culture system.

In this system, plant roots are suspended in the air within a closed container. Spray nozzles are used to mist the roots inside the container.



Aeroponic System

Quality and Safety of Vegetables

Quality: Produce quality is a broad term that generally includes physical characteristics, nutritive and sensory attributes and content of secondary metabolites (Rouphael et al. 2012[5]).

Factors Influence on Produce Quality

The factors influence on produce quality are:

Cultural Practices: Cultivar, growing medium, plant management, pest management

Cultivar/ Species Selection: Plant quality attributes are mainly determined by selection of species and varieties adapted to culture systems.

Growing Medium: In soilless culture systems, it is important to monitor nutrient solution properties, such as electrical conductivity (EC), chemical forms of the elements, temperature and pH.If well managed, a soilless culture system gives the opportunity to improve produce quality due to precise nutrient solution practices.

Nutrient and **Moisture** supply are major concerns, especially in extensive production.

Fertilizers: Use of fertilizers can help boost the yield and quality of the crops. However, excessive use of fertilizers in crops can lead to over-accumulation of dangerous or toxic substances such as **nitrates**, **oxalates** and **mercury**, lowering the quality and safety of the produce.

[5] Rouphael, Y., Cardarelli, M., Schwarz, D., Franken, P. and Colla, G. (2012). Plant Responses to Drought Stress. 10.1007/978-3-642-32653-0_7.

Irrigation: Efficient use of irrigation water is an important and the concept of water footprint should be taken into consideration for all kinds of plant production (Lovarelli et al. 2016[6]).An excess or deficit of water affects plant and produce quality.

Pest Management: All farmers, regardless of where they grow their crops, have to cope with pests. Use of synthetic pesticides which have been reported to cause serious environmental and health problems may not be sustainable. Use of biological control and integrated pest management may be the most sustainable way of managing pests without compromising plant and produce quality.

Environment: Light, Temperature, Wind**,** Precipitation

Light: Light is a very important environmental factor for phytochemicals, phytomedicine, sugar and ascorbic acid accumulation and colour development.

Low light intensity leads to less sweet produce with a lower content of ascorbic acid and usually higher levels of nitrate and oxalate, compounds that are generally considered anti-nutritional. On the other hand, excess light or extreme light intensities can cause loss of quality due to sunscald on many fruits (Rouphael et al. 2012[5]).

Temperature: Suboptimal temperatures not only slow down growth and development, but make crops such as tomatoes less juicy and aromatic, with low acidity content, thinner skin and worse storage ability.

On the other hand, cool temperatures can in some cases improve quality due to enhanced carbohydrate accumulation in tomato (Rouphael et al. 2012[5]).

Wind: "Clean air" can be complicated to define, due to variations in sources of air pollution. Crops grown areas can be contaminated by airborne particles (Säumel et al. 2012[7]).Measurementsof fine particles PM2.5 and PM10 serve as indicators of air quality.

Precipitation: Production of high quality vegetables cannot exclusively rely on rainwater, but needs to be supplemented by irrigation.

Biotic Damage: Production of high quality vegetables could be threatened by pests and diseases.IPM and natural predators should be considered.

Safety of Vegetables

Safety

- Physical, chemical and biological hazards can compromise food safety. Food safety is the responsibility of all, regardless of production systems.
- Due to the current lack of information on outbreak statistics, it is not possible to generalize that food safety risks are greater in one system than another.

[6] Lovarelli, D., Bacenetti, J. and Fiala, M. (2016). Water Footprint of crop productions: A review. Science of the Total Environment. 548–549, 236-251.

[7] Säumel, I., Kotsyuk, I., Hölscher, M.,Lenkereit, C.,Weber, F., Kowarik, I., (2012). How healthy is urban horticulture in high traffic areas? Trace metal concentrations in vegetable crops from plantings within inner city neighbourhoods in Berlin, Germany.Environmental Pollution. 165, 124-132.

Physical Hazards

- A physical hazard is any extraneous object or foreign matter in a food item which may cause illness or injury to a person consuming the product, such as, soil/growing medium, stones, wood, bone chips, metal or glass, plastic items.
- Air quality, in terms of load of coarse and fine particles as well as nano-particles are important factors. Crops grown areas can become contaminated by airborne particles (Säumel et al. 2012).

Chemical Hazards

- Chemical hazards arise in the form of **heavy metals**, pesticide residue, undesired organic contaminants; in particular persistent organic products, the presence of mycotoxins as well as **antimicrobial compounds**.
- These contaminants can occur either **naturally** or may be introduced during **primary production** or **postharvest handling**.

Biological Hazards

- Biological hazards are organisms, or substances produced by organisms, that pose a threat to human health.
- These organisms can affect human health, including infection, intoxication and even death.

Major Biological Hazards are:

Bacteria: ex: Salmonella spp., Escherichia coli, Listeria monocytogenes,, Bacillus cereus, Staphlococcus aureus, Clostridium botulinum

Virus: ex: hepatitis A virus, Norwalk viruses, Rotavirus

Parasites: ex: Toxoplasma gondii, Cryptosporidia, Giardia spp., Trichinella spiralis, Taeniasolium, Anisakis spp.

Conclusion

- Vegetables are very important nutrients of our healthy diet and a rich source of many essential micronutrients, phytochemicals and antioxidant. At the same time vegetables are the vehicle of different health hazards elements.
- Sustainable vegetables production in urban and peri-urban areas provides food security and high quality of food, efficient use of resources, enhance environmental quality, increase employment and entrepreneurship, decrease land use, increase economic viability and quality of social life.

Session 4

Value Chain Concept, Approach and Applications

Dr. Patrick Nugawela

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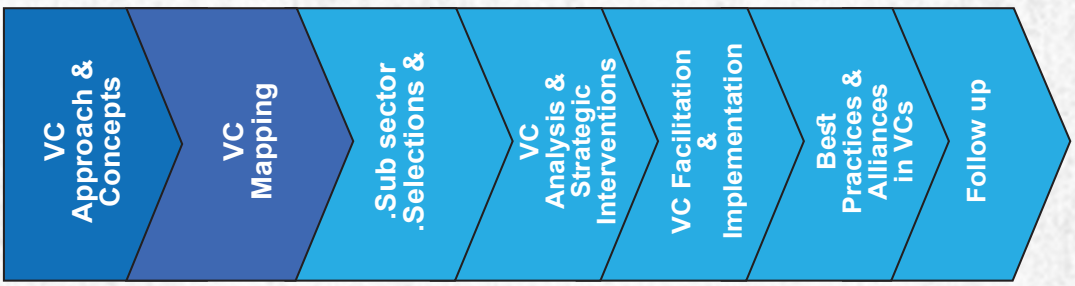
Value Chain Concept: An Introduction

1. Understanding the Concept of Value Chain Development

There are several aspects need to be studied. These include value chain approach and concept, value chain mapping, selection of sub sectors,how to do the analysis and defining strategic interventions of the value chain, how to facilitate and implement value chain interventions, what are the best practices and developingalliances of a value chain development and how to follow up application of value chain interventions. These are schematizedas follows that forms the important modules of training on value chain concept and applications.



This section of the Manual intends to cover only the first two aspects only

The Value Chain (VC) Concept:

It is a relatively recent concept used, by mainly development practitioners. It is a sub sector based Development Approach.

It is:

- Increasingly used as a powerful- robust tool by development practitioners in both developing and developed countries to support the growth of potential of agriculture sub-sectors
- For many developing countries it is an important tool extensively promoted by governments , donors and private sector to review agriculture sector strategies to :
  - Address the issues on poverty reduction , income generation and food security
  - Make markets work for producers going beyond the traditional subsistence production to a business oriented production that compete in the market

- Enhance the growth potential of large numbers of formal and informal SMEs
- Developed countries also use the Value Chain approach as a powerful tool to:
  - formulate and implement competitiveness development strategies
  - Position businesses to improve performance.
- In the1960s, France already used a similar concept – using the word "le filière"- means - " A thread" . It refers to building alliances –links between contract farming and processing through vertical integration in agriculture sub sectors Michal Porter – famous economist in his book 20 years ago spoke about competitive advantages for nations – which was a basis for Value Chain development concept over the last many years

1. Value Chain - Concept and Approach

1.1. The Value Chain Concept – How do you define it? What are the main elements included in it?

It is a concept that:

- Speaks about a full range of activities required to bring a product / service through different phases of production to market – Basically a vertically linked system
- Speaks about a chain of value creation at different levels of sub sector- production – to – market
- Speaks about a network of alliances of companies /individuals which interact to deliver goods and services.- Means Relationships
- Targets sub sector growth where market is Key- Produce for a market
- Appears to be enterprises linked - a Private sector led approach
- Information Flow across the sub sector

1.2. Value Chains – How do you define?

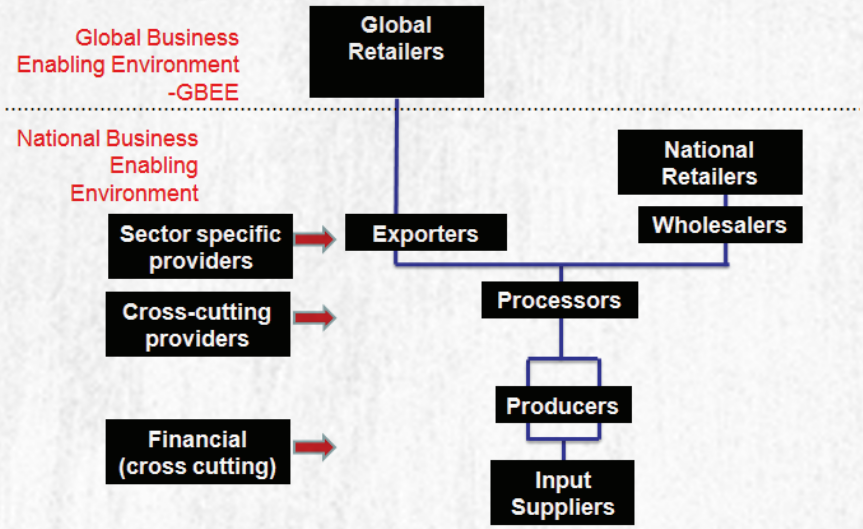
Value Chain Concept is basically expressed as a framework that can help to understand:

- How inputs and services are brought together and used to grow, harvest, transform and manufacture a final product to be introduced to consumers.
- It is a framework that explains how a primary product moves physically from the producer to market – to customer while adding values at deferent stages.
- In other words, a Value Chain framework refers to a process under which a business receives raw materials, add value to them through production, transforming to create a finished product required by the consumer.

  It demonstrates how value increases along the way at different stages from production to market and the environment under which all these can happen effectively

1.3. How does a Value Chain Framework presented ?

The Value Chain Framework – Basic map

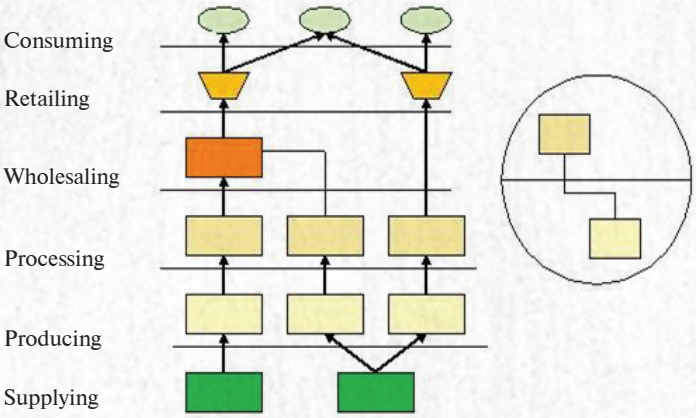


Value Chain Framework is not always a one simple product flow of events.

- The above chart is only a basic VC Framework that can serve only as a guide to those who analyses the value chain applications
- It can be expanded to several Value adding product flows within the same product or a service

For example a Basic Value Chain Framework is a map and it could have several product flows

Basic Value Chain Map expanded including several product flows.



1.4. Key elements of the Value Chain Framework to remember

In a value chain analysis there are several elements that are important to remember.These include:

- The Key Element is that it is a Vertical channel –that comprises a range of activities required to bring a product from its conception to its end use- Market through market channels available – This is referred as "Relationships".
- At every level of value addition you have actors who are willing to cooperate and to trust each other. These include; Input suppliers, farmers/producers, traders, wholesalers, exporters, retailers etc...That could make a chain works without interruptions. The key word here is "actors".
- The Value chain has also horizontal relationships –that are supporting markets that facilitate the process –Business Development Service (BDS) providers, Financing, insurance, Technical assistance etc... They are called "facilitators".
- To make the process work – you need **factors of production** –inputs, infrastructure, services, human resources, financing etc. The key words here are Factors of Production".

1.5. VC Framework and Enabling Environment

A value chain framework cannot operate effectively in an economy or in a specific product sector without an enabling business environment operating around the value chain. This enabling environment is comprised of:

(a) National enabling business environment(NEBE) – This include basically access to land, finance, inputs, R&D, enabling fiscal and monitory policies, business registration procedures, duties and tariffs, and infrastructure facilities made available for a value chain to operate smoothly.

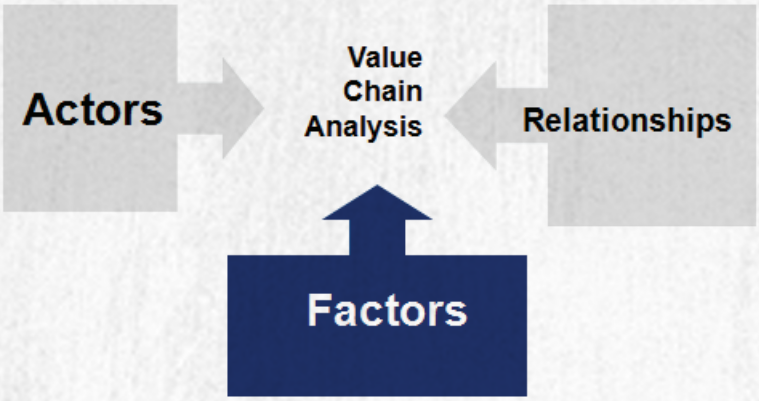
(b) Global Business Enabling Environment (GBEE): These are generally referred to access to standards & certification, specific trade agreements, application of WTO rules, facilitations and incentives to promote exports and specific fiscal incentives to enter export markets

The enablingenvironment comes from public sector and it involves extensive work on promoting appropriate policies that make the value chain works effectively in a given economy,

1.6. VALUE CHAIN: A frameworkand analysis of value chain development

The above introduction is a 1st step to understand what the value chain concept is. The next step is the analysis of a given value chain to document how really a value chain works on theground.

The analysis starts from understanding the interactions between actors, factors and relationships to bring a product to the market.



2. Value Chain approach and other considerations

2.1. Some areas that Value Chain approach significantly influences

Addressing the issues of competitiveness of sub sectors required by the local market or if for exports required by the continued process of Globalization;

(i). Poverty Reduction Strategies in Developing countries

(ii). Adapting products to respond to trends of the Markets

(iii). Use value chain concept to enhanced contribution to Small and medium enterprises (SME) Growth along the chain,

(iv). Value Chain Concept is a Robust tool for decision makers on development actions that can guide them how, where and when to put support to development of selected value chain

2.2. Value Chain Approach and Globalization

- Globalization and elimination of trade barriers result in dramatic increase in international trade. But all the countries, particularly small &resource poor developing countries do not get a significant share on this trade. Therefore, the value chain concept could help the small countries to work on competitiveness of their products to introduce and compete in the global market.
- Without further improvements in business environments and competitiveness of export commodities, many small developing countries' risk being trapped, perpetually producing low skill, low value products and services.

According to Jan Van Tockel of Value Chain Management Centre, Canada, **"Closely aligned value chains are one of the most powerful tools in today's globalized business economy. "**

2.3. Value Chain and Poverty Reduction

- Agriculture is the largest employer in Developing countries; "For the poorest, GDP originating in Agriculture is 4 times more effective in raising income for poor than GDP growth". (WDR, 2008)
- Production of agriculture goods and export revenue that agriculture generates plays a vital role for Poverty Reduction.
- As globalization continues, small developing countries will face increasingly innovative, and cost efficient competition from resource rich countries and developed world.
- Poverty reduction is not sustainable without linking poor to growth opportunities that link them to produce what markets want and making markets work for poor (MMW4P).

2.4. Value Chains and Market Trends

Value Chain Concept is widely used today to

- Produce products for markets liberalized of tariff and non-tariff barriers through Bilateral & Free Trade Agreements.
- Adapt to promote specific products for branding, certification, traceability, niche and specialty markets
- Produce to adapt to changes in the market, such as changing Fashions, demand for Organic products, environment protection, regulations, etc.
- Identify specific requirements of national and global retailers, international super markets
- Address Consumer concerns, such as labour practices, Standards,certification requirements

2.5. Value Chains and Opportunities for SMEs development

- SMES are critical in a VC approach. They play a vital role at all levels of value addition along the chain.
- From producer to market every actor is an SME, formal or informal
- Supporting growth of value chains is supporting a large numbers of small firms involved along the chain. Inputs suppliers, transporters, harvesters, processors, traders are some of the SMEs along a value chain.
- In developing economies, small firms matter that is the strength of the private sector.
- Value Chain approach is used to guide and drive sustainable initiatives focussed on improving productivity, competitiveness, entrepreneurship through the growth of SMEs

2.6. Value Chain Approach and Development Planning

VC approach is a robust tool for decision makers, governments and donors. The value chain analysis for given product is useful

- To identify sub sectors to be supported.
- To focus on overall sub sector growth for a systemic change rather than upgrading individual firms.
- To promote VC s to devise interventions to reposition industries, build business competitiveness, devise policy measures and decide actions to promote growth of sectors selected.
- To facilitate upgrading of sub sectors selected to generate returns, to Promote Foreign Direct Investment (FDI), and examine constraints in enabling environment.

For Policy professionals, donors, and planners, VC analysis is an ideal framework to identify, design and evaluate an investment in commercial agriculture.(Guide to Value chain concepts and Applications WB –M Weber and Patrick Labaste).

2.7. Your experience in promoting Value Chains

- Questions for discussion by the groups when doing promoting value chains.
    - Have we focussed on identifying what sub sectors to be promoted or on individual enterprises systematically?
    - What roles do we play in promoting sub sector growth, Actors? Facilitators? Supporters?
    - Have we ever individually or at institutional level tried to analyse value chain and identified options of where to intervene?
    - Have we tried to create/develop alliances between producers and markets in the Country?
    - Have we focussed on making a systemic change in the province through a sub sector approach to address issues of poverty, SME development, and policy for enabling environment?
    - Are we still following a “Supply Push” traditional business approach or “market focus” Value chain principles in supporting growth in the Country?

2.8 Traditional Business Approaches vs. Value Chain Alliances

Components	Traditional Business	Value Chain Alliances
Sharing of Information	Limited or None	Extensive
Type of information exchanged	Transactional (price, order entry, shipping, physical characteristics)	Managerial & Strategic (as required to tailor products & services to customer needs: market signals, costs, margins, quality, product & process innovation)

Components	Traditional Business	Value Chain Alliances
Structure	Long, Complex and Uncoordinated Short	Straightforward and Coordinated
Primary commercial focus	Cost/price	Value/quality
Orientation of Market	Commodity	Differentiated
Market focus	Generic and price based	Segmented and value based
Market strategy	Fragmented and splatter-gun	Segmented and value based
Relationship to Market	Producer "Push"	Consumer "Pull"
Organizational Structure	Independent	Interdependent
Philosophy	Self-Optimization	Chain Optimization
Business relationship	Adversarial	Collaborative
Timeframe	Short Term	Long Term
Company orientation	Individualistic (boundary of the firm is distinct – focus is on "self-benefit")	Collective (boundary of the firm is blurred – focus is on "mutual benefit")
Industry focus change	Resisting	Adapting to Change
Company Characteristics	Preoccupied with External Threats	Focused on Exploring Opportunities from Within
Process and Systems	Fractionalized	Integrated
Financial focus	Few: apply only to transactions, are short term, & inconsistent in their effectiveness	Many: apply to operations and strategy, are medium to long term, and consistent in their effectiveness
Risk management Options	Top-down, autocratic and rigid	Autonomy of personal accountability to encourage continually improvement
Corporate Culture	Maintain and protect the status quo at the operational and strategic levels	Empowerment to challenge the status quo within strategic guidelines; strengthen the commitment of suited partners; purge the chain of unsuitable participants
Purpose of Governance	Maintain and protect the status quo at the operational and strategic levels	Empowerment to challenge the status quo within strategic guidelines; strengthen the commitment of suited partners; purge the chain of unsuitable participants
Incentive calculated on	Price and volume within an individual	Company Value created along the chain

Source: Gooch, M. (2005), Drivers, Benefits and Critical Success Factors of Developing Closely Aligred Agri-Food Value Chain Georjc Morris Ceafer, Canada Doti (0.22004) ag.econ. 289866.

2.9. Value Chain vs Supply Chain

- Value Chain refers to a process under which a business receives raw materials , add value to them through production, transforming and other processes to create a finished product required by the consumers. This is vertical a relationship
- Supply Chain involves fulfilling customers request and it presents steps to get a product to the customers – not an interrelated vertical relationship
- For Example: In many developing countries such as Sri Lanka, vegetables coming from subsistence agriculture sector operates mostly as a supply chain rather than a value chain though because there is limited value chain addition from the farm to market place.

1.10. An example of applying Value Chain Framework to Sri Lanka Vegetables Value Chain

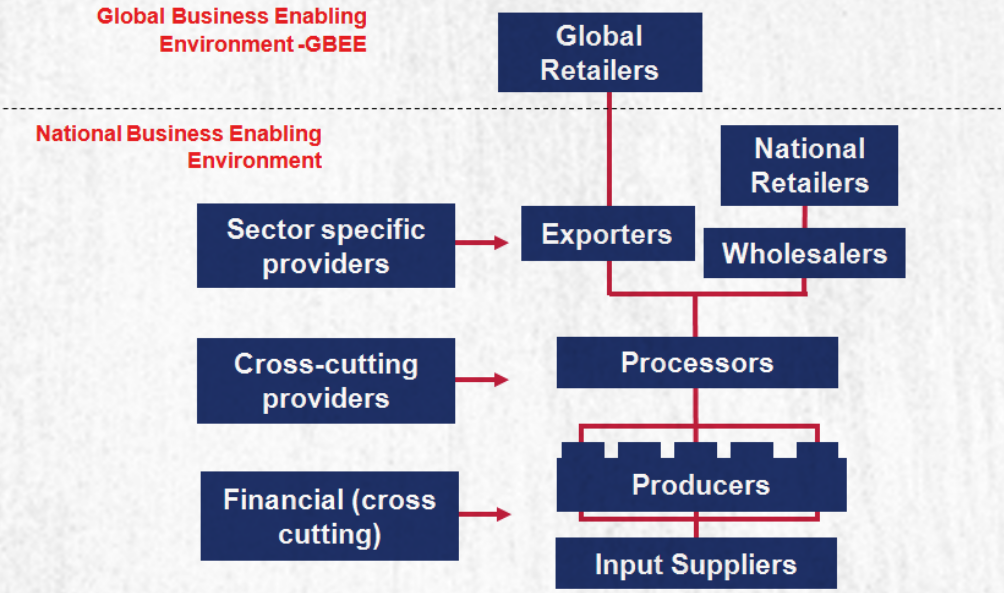
- Sri Lanka's –Vegetables Sector is basically a Supply Chain.
- Not much value addition takes place –limited processing sector.
- However, there is some indications of grading and sorting operations at farmer level and
- Some value addition at exports and super market supply levels.

Tools for Value Chain Mapping

- To understand how an industry or subsectors works in the field
- To understand who does what - actors , functions and relationships,
- To identify market segments
- To identify product flows – channels
- To Identify trends – dynamics of sub sector or industry
- That assists in communication – internally and externally

What is a Value Chain?

Refresh the initial – Value Chain Framework Models



Contents of a Map – what do we Map?

Two types of Maps: Basic Map and Detailed Map

First look at the basic map and then proceed with by working on a Detailed Map (by addition).

Basic Map

- Functions
- Product life cycle from conception to end use
- Actor(s) at each function- Vertical
- Linkages between Supporters and facilitators -Horizontal the actors participants– horizontal and vertical

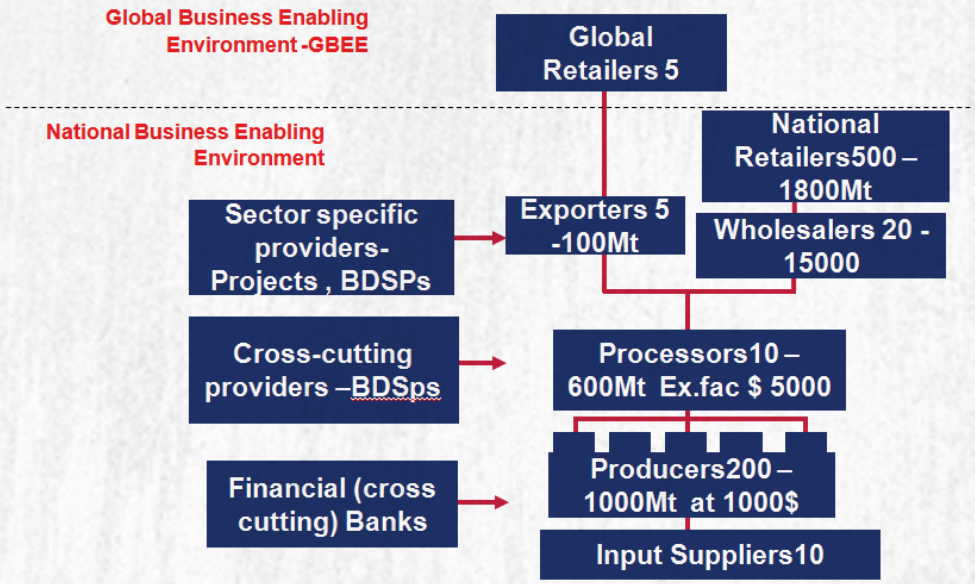
Detailed Map (You start adding)

- Added value or gross margins of each function at each level
- Number of firms performing each function
- Volumes moving between levels
- Values of volumes moving

What is a Value Chain?

Refresh again the basic – value chain framework models –

Detail Map



3. VC Mapping : Steps

1. Identify and list the functions – (verbs)
2. List the Actors (names)
3. Identify end market (Segments)
4. Complete the actors – functions work sheet
5. Identify the facilitators /service providers /supporters & activities
6. Identify various product flows
7. Identify Value Chains – various product flows Place actors on their functional areas
8. Place supporters and facilitators at different levels
9. Finalize basic map then to detail map

3. 1.Value Chain Mapping

(a) Steps 1 & 2: identifying Functions and Actors

Functions	Actors	Facilitators /Supporters
• Consuming	• Consumers	• Service providers
• Exporting	• Exporters	• Financial services
• Retailing	• Retailers	• Associations
• Wholesaling	• Wholesalers	• R and D institutions
• Processing	• Processors	• Public sector- facilitators
• Traders	• Harvesters,	• Private sector

Functions	Actors	Facilitators /Supporters
• (Harvesting – Collecting)	• Collectors	
• Producing	• Producers	• Donors /Projects/ NGOs
• Inputs Supplying	• Inputs Suppliers Producers (Small Large etc.)	• Economic Interest Groups

(b) Step 3: Identify end markets

End markets – Some Value Chains are Local and some are Global markets

- End markets – Inputs
- Local Raw materials /semi processed products
- Supplies for processors /value addition
- Local wholesale markets
- Local retail markets
- Local super markets
- Export markets

(c) Step 4: Identify Actors Function Worksheet

Activities	Facilitators /Supporters											
	BDS Providers	Financial services	Organization /associations	Producer Associations	Public sector institutions	R and D	Donors/projects					
Technical assistance												
Micro finance												
Access to loans												
Pilot projects												
Linkages												

(d) Step 5: Supporters and Facilitators Function Worksheet

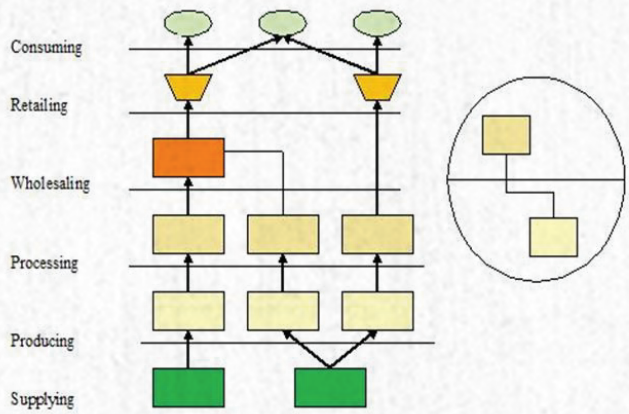
Activities	Facilitators /Supporters											
	BDS Providers	Financial services	Organization /associations	Producer Associations	Public sector institutions	R and D	Donors/projects					
Technical assistance												
Micro finance												
Access to loans												
Pilot projects												
Linkages												

(e) Step 6: Identifying Actorsand Facilitators

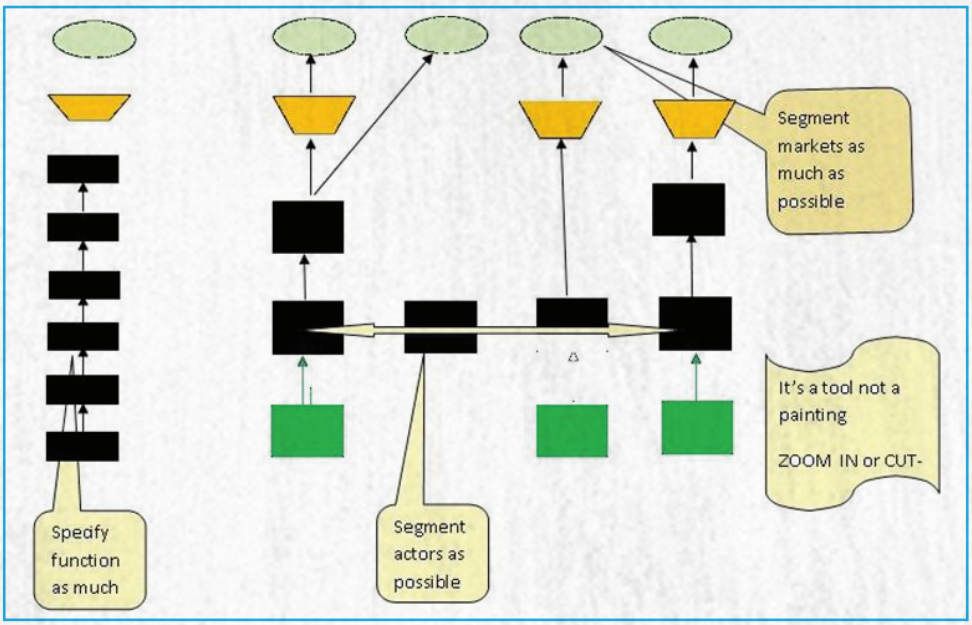
- Work sheets finalized by Technical Assistance supported projects.
- Different actors have different functions from production to consumer
- Facilitators and supporters have different activities – added to the list of the work sheet as identified and updated
- Functions of actors can be one or several by actors, would be the same for the facilitators and supporters
- Worksheets make drafting basic map easier.

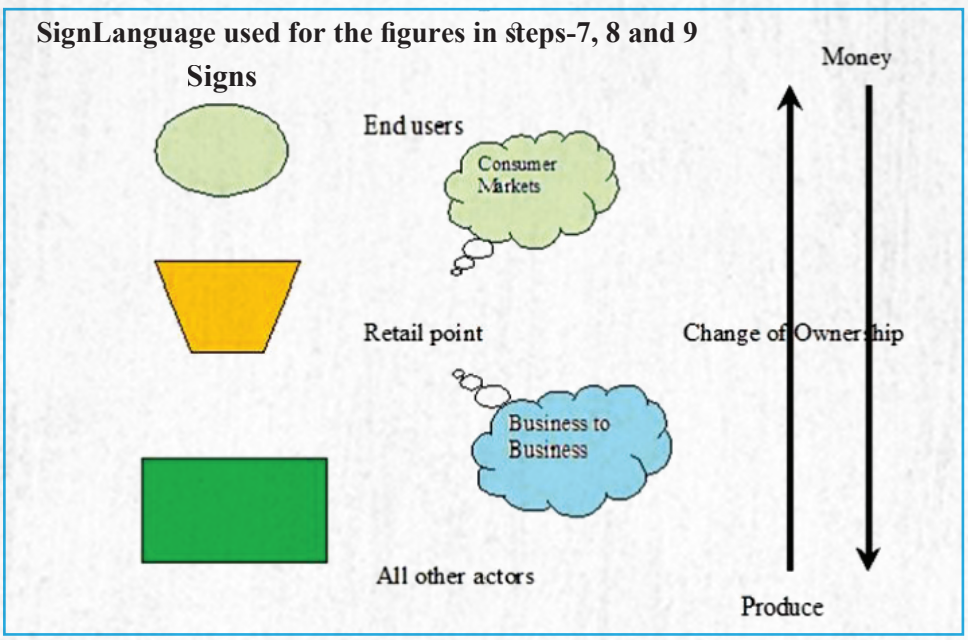
Structure of Basic Map – several products flows

Basic map:

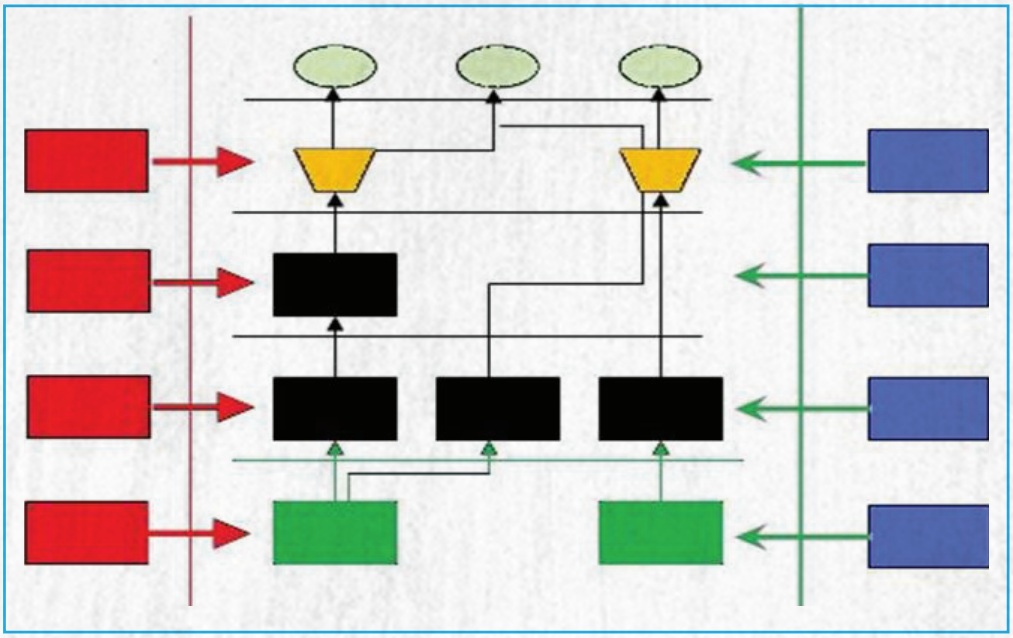


(f) Step 7 : Identify Value Chains – various product flows (Ref: Mapping by HPC)



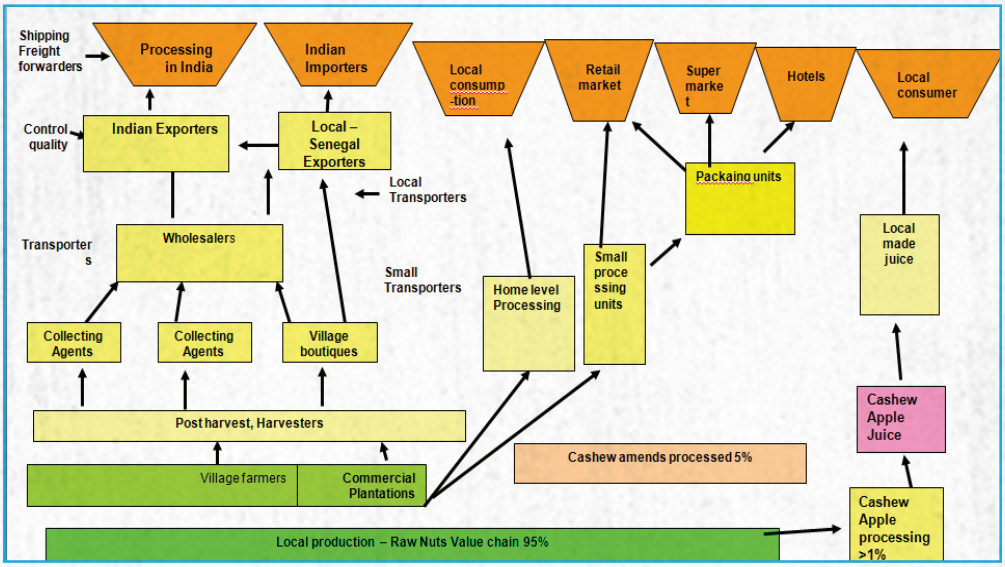


(g) Step 8: Placing VC actors and supporters/ facilitators



(h) Step 9: VC map – Cashews in West Africa

(Ref. USAID Economic Growth Project Senegal, Patrick Nugawela)



Session 5

Developing Sustainable Value Chians

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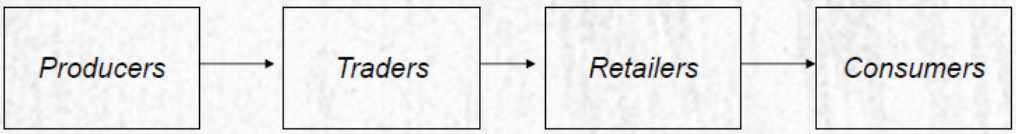
What is a Value Chain??

Exercise 1: Brainstorming exercise

Is this a Value Chain?



Why or why not?

Understanding the Context:

Supply Chins vs Value Chains

- What are Supply Chains?
- What are Value Chains?
- Are these two mutually exclusive or complementary to each other?

Value Chain?

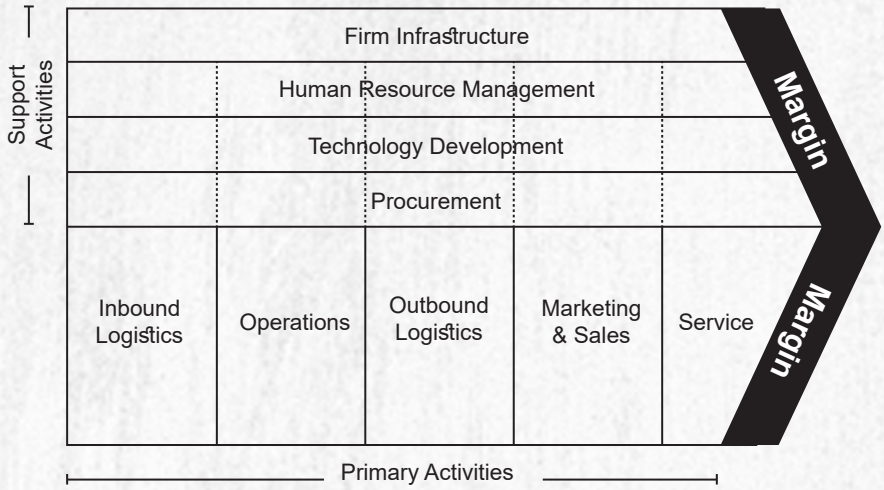
- The Value Chain Concept: developed by Michael Porter, in 1985 through his seminal work "Competitive Advantage"
- The idea behind Porter's Value Chain is to focus on the activities undertaken by a firm (and their interaction) to create value as sources of competitive advantage.
- "Value Chain": the combination of nine generic value added activities operating within a firm – **activities that work together to provide value to customers.**

Another Definition

- A Value Chain is "the full range of activities which are required to bring a product or service from conception, through the intermediary phases of production, delivery to final consumers, and final disposal after use." (Kaplinsky 2000:121)
- This definition often used in the development literature

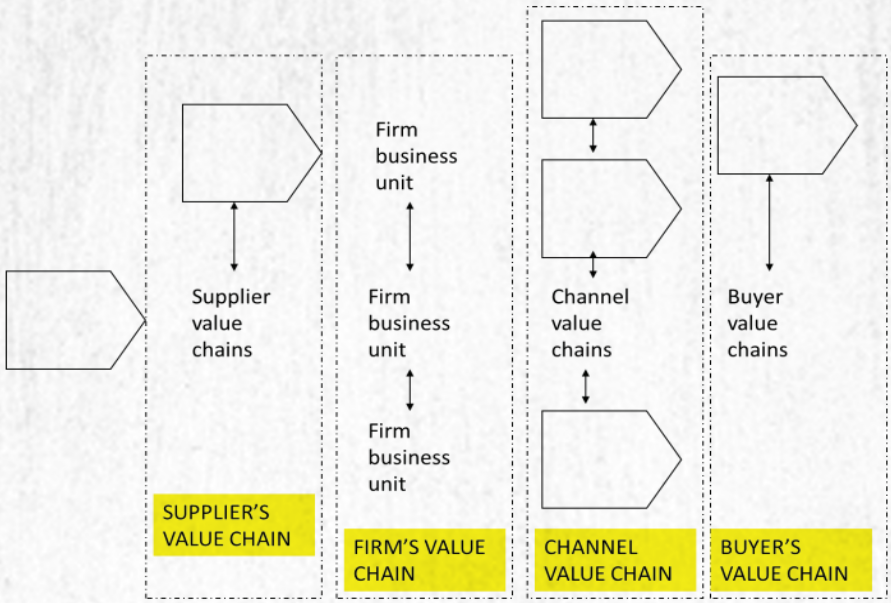
Poter's Value Chain

Figure 1: Porter's Generic Value Chain



The focus is at the level of firm

Poter's Value System vs Value Chain?



- Value Chains of firms linked up together
- It encompasses the broader system of activities from raw materials to consumption.
- In today's context there is a greater outsourcing and collaborative linkages between multiple firms'

- Therefore, the "Value creating processes in the present context" is called the "Value Chain."

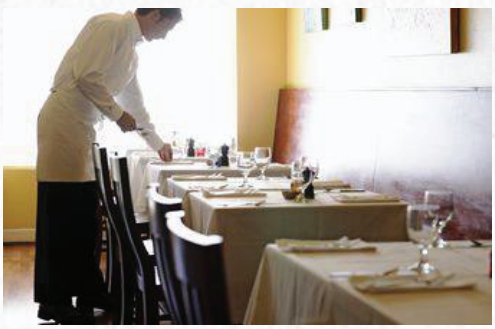
The Primary focus in Value Chains are on:

- The benefits that add to customers,
- The interdependent processes that generate value, and
- The resulting demand and created flows of funds
- Effective value chains generate profits.

What is Value?

- The amount buyers are willing to pay for what a firm provides.
- A subjective experience (i.e. contextual)
- Occurs when needs are met through the provision of products, resources, or services
- Value is an experience, and it flows from the person (or institution) that receives resources – it flows from the customer

A man dying out of thirst in a desert (doesn't matter even if the container is dirty)



A busboy cleaning a table with partly consumed water glasses (water has no value or negative value)

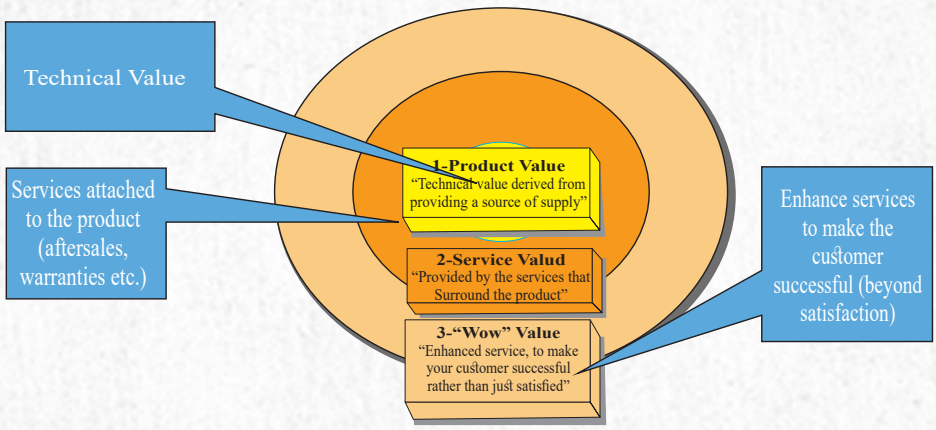
- Two critical factors that need to be clarified when strategizing the creation of value: 1) Who are the customers (B2B or B2C)? 2) What do they value?

- Value occurs when customer needs are satisfied through an exchange of products and/or services for some form of payment.
- Value can be measured in terms of the degree to which the needs met exceed the price paid in the exchange.
- Therefore, most firms try to understand customer needs and values, and then organize their activities for efficiently fulfilling those needs (quickly, accurately, and at minimum cost).
- There are three forms of value that occur in B2B commercial transactions/exchanges
- Technical (Resource Value): Central to the resource being provided and occurs in virtually all exchange situations (e.g. water has the same technical value for a thirsty person even the container is dirty or provided by an outlaw)-Accrues to the firm
- Organizational (Business Context): Build upon the context of the exchange such as ethical standards, prestige and reliability leading to brand image and company reputation (e.g. the label on the water bottle generates value far in excess of the bottle's content in a fine dining situation)-Accrues to the firm.
- Personal (Career and Unique to an individual): derived from the personal experiences and relationships involved in the exchange of resources and the benefits provided-Accrues to the individual (manager motivation, preferences, feelings of comfort and trust may create value for individuals that engage in trading relationships on behalf of firms)
- Competing offers also can erode market value (and margins) which will make the lowest price a deciding factor in evaluating an exchange.

In B2C (Business to Consumers) exchanges:

- At the consumer level of exchange, value is layered, and described by three concentric rings

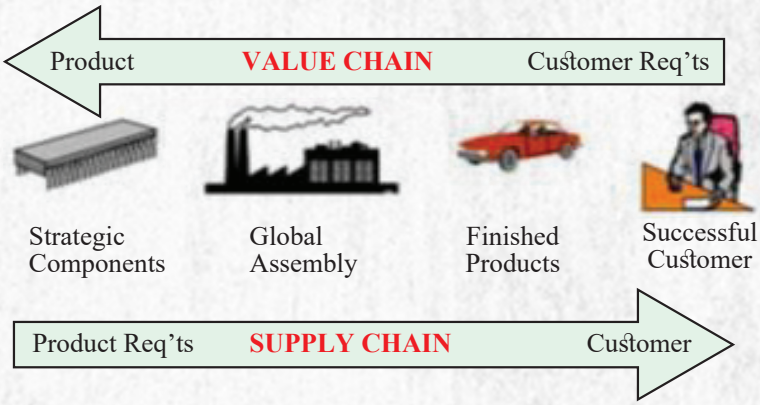
» The company's ability to provide value to customers generates revenues in excess of costs (creates profit and therefore shareholder value).



- Since value is derived from customers needs, activities that do not contribute to meeting these needs are "non-value-added" waste (the margin between delivery cost and perceived value) could be enhanced by a. Increasing the resource use efficiency, decrease the cost and improve a firm's profit margin through streamlining the processes that generate the goods and services (The essence of corporate strategies that focus on operational excellence) and/or b. Introducing Innovation and marketing strategies that focus on improving customer perceptions of the value of goods and services (i.e. innovatively improving the perception of what gets delivered).

Supply Chain vs Value Chain

Upstream



Downstream

- Customer is the source of value
- Value flows from the customer in the form of demand (i.e. demand chain)

Supply Chain

- Supply Chain is a term "to encompass every effort involved in producing and delivering a final product or service, from the supplier's supplier to the customer's customer"
- The primary focus of supply chains: reduce costs and increase efficiencies of supply, and the flow of materials from their various sources to their final destinations.
- SCM: The objective in supply chain management is managing the flows between and among stages within the supply chain to maximize supply chain profit
- Efficient supply chains reduce costs (and hence increase the value).
- A Supply Chain and a value chain are complementary views of an extended enterprise with integrated business processes that enables flows of products and services in one direction, and value as represented by demand and cash flow in the other direction.
- Both chains overlay the same network of companies. Both are made up of companies that interact to provide goods and services.

Supply Chain vs Value Chain

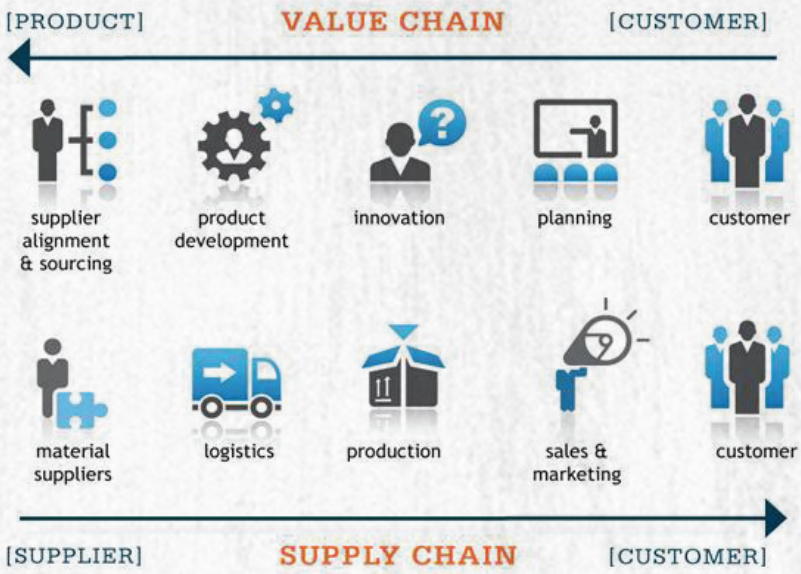
The primary difference between a supply chain and a value chain is a fundamental shift in focus from supply base to the customer.

- Supply Chains focus upstream on integrating supplier and producer processes, improving efficiency and reducing waste (and hence adding value).
- Value Chains focus downstream, on creating value in the eyes of the customer.
- Value surrounds the movement of resources – is perceptual – and accrues to both parties in a transaction, suppliers and customers.
- While Supply Chains focus primarily on reducing costs and attaining operational excellence, value chains focus more on innovation in product development and marketing

	Supply Chains	Value Chains
Primary Focus	Material (product) flow – pushing what is made/available through as many distribution channels	The identification of opportunities to differentiate, but adding value to cater to consumer preferences
Information	Transactional (eg. sales orders, delivery notes, invoices) Information is viewed as a cost	Behavioural (eg. attitudes, perceptions, motivations), Viewed critical success factor shared with like-minded trading partners
Relationships	Arms-Length (Lack of trust and commitment between opportunistic buyers and sellers.) (Grain silos)	Collaborative Collaborative cost reduction and differentiation that can be shared for the longer term benefit of all stakeholders in the chain (cohesive)
Financial	Cost-Plus (businesses do whatever it takes to cut costs (including the abuse of market power).	Value Added (add value wherever opportunities exists,)

All in all, Value Chains can operate in both directions:

- Suppliers accruing value from the financial resources, payment terms, stability, and future order cover that their customers provide and
- Customers derive value from the products and services delivered.
- Therefore, creating a profitable value chain requires alignment between what the customer wants (i.e., the demand chain) and what is produced (via the supply chain).



Then Why Value Chains?

Why Value Chains?

- Agro-food systems have become:
- More complex, more dynamic, more challenging, also with more potential;
- Looking only at the producer in agriculture is no longer sufficient;
- The context of food system and the institutional/policy environment also matters,
- These contextual drivers shape producer livelihoods,
- To address these "systems approaches to agriculture" are needed

Need for Value Chains

Developing world agro-food system characteristics in the past	Developing world agro-food system characteristics today
Focus on supply (supplypush): quantity, bulk products	Focus on demand (demand-pull): quality, standards, brands
Public policy focused on commodities (price policy, technology)	Public policy focused on food systems, environment, enabling environment (more nuanced)
Local markets, local players	Global markets, international trade, multinational players, supermarkets
Coordination mainly through prices	Coordination through contracts, vertical coordination
Staple commodities (rice, wheat, maize)	High-value products (horticulture, meat, fish)

Some more reasons for why Value Chains are needed?

- Food Safety Standards (FSS) are a key component of the shift due to heightened demands by consumers in developed countries for safe food (i.e. in global value chains)
- Retailers increasingly use FSS as a means to compete and gain market share.
- Sourcing from developing countries may be problematic if standards or specifications cannot be met. Therefore, there is a need for tighter governance structures to ensure standards or specifications.
- Although there are growth opportunities, meeting increasingly higher and higher standards has reduced opportunities for inclusion among smallholders and small-scale export operations
- It's not only about smallholder producers
- A significant dynamism is found in the "middle" of the value chain i.e., in distribution, processing, wholesale, logistics. • This has been driven by:
- Advances in information technology (traceability)
- Downstream trends and demands for branding, labeling, and packaging
- Regulatory changes in the business environment, etc.

Challenges

- The question remains unanswered are:

a) Can smallholders incur the added costs of;

- Producing safe/high-quality food?
- Being recognized as producing safe/high-quality food?
- Using cost-effective technologies to reduce risk?
- Competing with larger farmers?
- Entering high-value markets?

b) What are the burdens on policy makers in terms of;

- Where to intervene (Can we allow only the market forces to operate?)
- How to intervene?
- With what impacts?

The issues driving value chains center around issues of coordination, linkages and governance. Therefore, the government should play a facilitator role.

In such a context identifying the entry points for facilitator (i.e. government/NGOs) is critical

- How to help with brokering vertical business linkages at a micro-level (supplier-buyer) – the role of contract farming e.g.?

- How to encourage horizontal linkages? (Collective action, Associations) and be further supported by PPPs.
- Where are the key leverage points for facilitator investment (Government/NGOs/INGOs) within the chain (in term of Research & development, technology, infrastructure, etc.)?

Example: Vertical linkages through contracts

- Vertical linkages: link suppliers to markets, often small producers with formal sector buyers.
- Formalizing transactions through contracts or out-grower schemes is required (in many cases) given the nature of products produced within a value chain
- High-value, perishable goods require adherence to various rules governing quality, reliability, etc.

For contract production to be sustainable:

- Relationships must be mutually beneficial and reduce transaction costs.
- Reduce risks in prices and output for both parties.
- Improve quality in the value chain (better coordination).
- Improve production practices.
- There is a tradeoff between transactions costs of the supplier to comply with contract specifications and those costs between supplier and buyer.

What makes contracts successful?

- Stable, profitable market
- Instability or rising prices can often mitigate success.
- Laws, regulations, and social capital that respect and enforce contracts
- Understanding of the obligations of contracts by all parties
- Other factors (Infrastructure, land tenure, input availability)
- What is the role of government in contract farming?
- Is mandating of contract farming (like in Vietnam) a good idea?

Role of institutional coordination

- Institutions can also play a key role to improve smallholder market access and compliance with standards. Collective action (CA), Public-Private Partnerships (PPPs)

  Collective action is an action taken by a group based on their common interests or goals.

Collective action aims at overcoming the problems associated with:

- The scale of smallholder production

- The lack of skills needed to comply with FSS

Role of Institutional Coordination

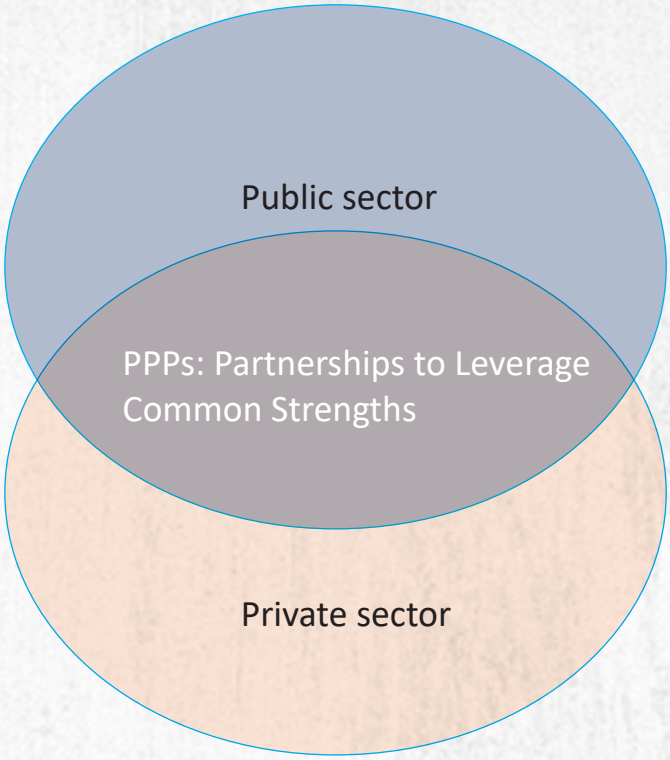
Table 1
Food Safety Standards and the role of Collective Action.

Supply chain process	Role played by collective action[a]
Pre-harvest	*Procurement of information about markets and the process of contract formation* *Dissemination of information relating to food safety standards* *Undertaking lumpy investments*
Production	Procurement of cheaper inputs through bulk buying Accessing extension services *Establishment of traceability systems* *Maintaining a group monitoring system*
Post-harvest and marketing	Collective marketing leading to reduced costs *Grading and certification* *Collaboration with marketing experts* *Maintaining a group monitoring system*

[a] Italics denote the roles played by collective action that specifically relate to food safety standards or that are significant compared to traditional markets.

Role of Institutional Coordination

- Public-Private Partnerships (PPPs) is a means through which public and private sectors can work together that leverage the strengths of each.
- PPPs have potential in providing the necessary institutional support to help smallholders compete.



- Why PPPs (Public-Private Partnerships) to support smallholders in high-value agriculture (HVA) value chains?

  One reason could be the demands imposed by HVA imply a changing role for both the public and private sectors (how?).

Role of Institutional Coordination

Public Institutions - extension, regulatory agencies and research institutes are involved in the supply chain. Are they equipped to meet demands of HVA and assist smallholders?

- Private sector functions include production, marketing, and distribution activities.
- The complexity of HVA, market failures, and high transactions costs often reduce private incentives to engage smallholders (Selection of private sector organizations?).

What PPPs do:

- Allow actors to pool resources and risks in investments to create mutual benefits;
- Combine the efficiencies of the private sector with the social equity aspects of public intervention;
- Remedy market failures that cannot be undertaken by public or private sectors.
- Create linkages between different actors in the supply chain

Value Chain Analysis: how can we move forward?

- The success of value chains requires the institutional support of various actors.
- "Champions" within the chain
- Partnerships with private sector entities
- A good business environment (good policies, etc.)
- Access to support services (extension, information, etc.)
- What are the policy and research entry points?

Some basic Principles

- Well defined roles in the process
- Well defined leaders
- Ownership in the process – actors all have a stake
- Mutual benefits to stakeholders
- Motivation to succeed

Other Important Considerations

- Value Chains are dynamic; consequently, learning and change are a key part of the process.
- Value Chain upgrading requires coordination and collective action. Governance is the main key.
- Conflict resolution measures are important (i.e. governance).

Value Chain Analysis (VCA)

- VCA help improve our knowledge of the agro-food system and provide guidance for interventions.
- VCA provides development practitioners with a systems approach to understanding marketing systems, in a similar way Supply Chain Management (SCM) provides businesses with means to manage the Supply Chain
- VCA and SCM are really not that different but complementary.

Key Elements to any Value Chain Analysis

1. Mapping the Chain
2. Identifying governance structures within the chain
3. Exploring areas of upgrading within the chain (Identifying opportunities for upgrading in the value chain)
4. Assessing benefits in chain participation

1. Mapping the Value Chain

- This step is crucial whether establishing a chain or analyzing one.
- Most analysts only do this stage – but this is only a part of the value chain story.

Key Goals:

- Assess the characteristics of actors and their linkages
- Understand role of chain activities in terms of broader livelihoods context (profit/income)
- Identify service providers and roles of public/private sectors
- Characterize business environment of the chain
- Compute flows of goods throughout the chain, including prices and seasonal variation

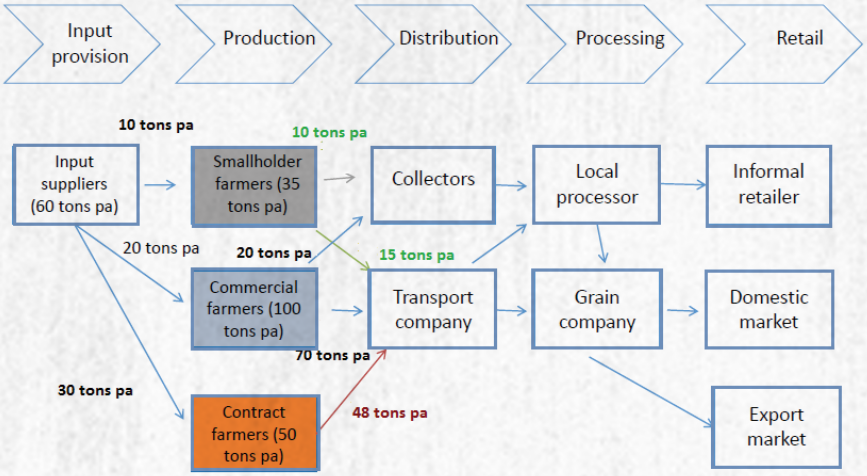
Main Outputs:

- Graphical maps of actor linkages and product flows (between actors and across space)
- Quantification of role of activity in livelihoods.
- Identification of production practices and costs
- Identification of the actors involved in the value chain under investigation,
- Typologies of chain actors based on income
- Identification of the nature of the prevailing relationships/ interactions (among themselves and between them and their enablers), and
- Identification of opportunities, transaction costs and chain constraints/problematic interfaces that can be addressed through various project interventions.

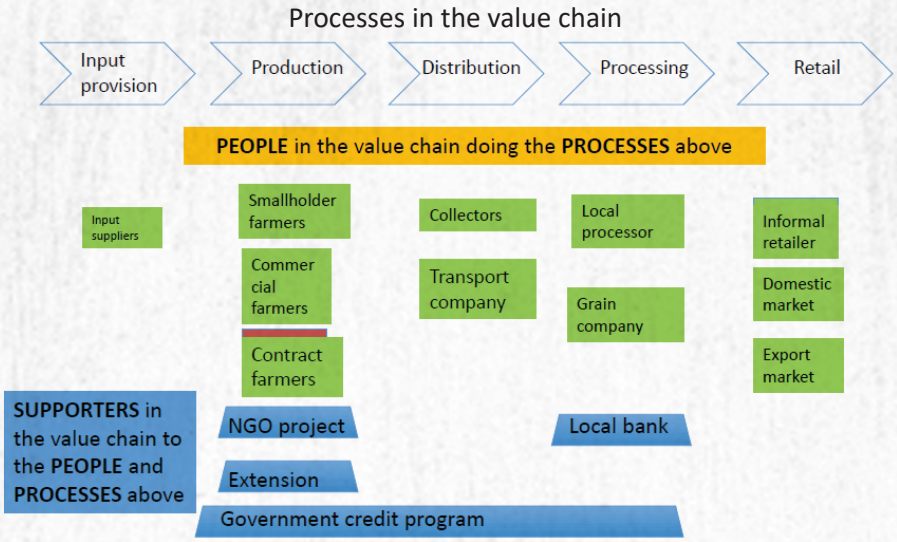
What should Value Chain Maps look like?

- There are no set rules. However, ValueLinks from GIZ provides a nice guideline for shapes and illustrations to use

A Generic Value Chain using GIZ Value Links



A Generic Value Chain using Value Links



2. Identifying Governance Structure in the Value Chain

Main Ideas:

- Identify the nature of relationships and coordination mechanisms that exist between actors in the value-chain.
- Provide details on aspects of the business environment of the chain
- Identify power relationships in the value chain

Main Outputs:

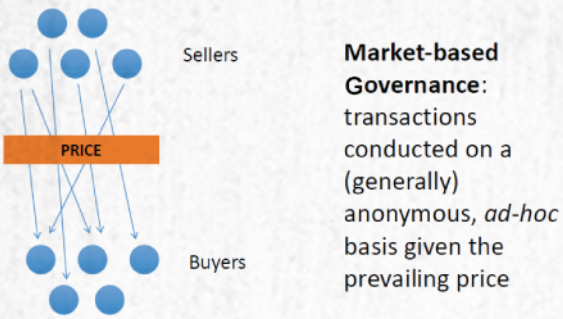
- Who decides what is produced
- How the rules of trade are determined
- The nature of relationships between the participants
- Roles of associations
- Coordination mechanisms (contracts, market sales, etc.)
- The extent of chain "power," based on the relative size of a particular actor, shareof chain profits, or control over a key technology

Gereffi et al. (2005) classifies Governance along a Hierarchy:

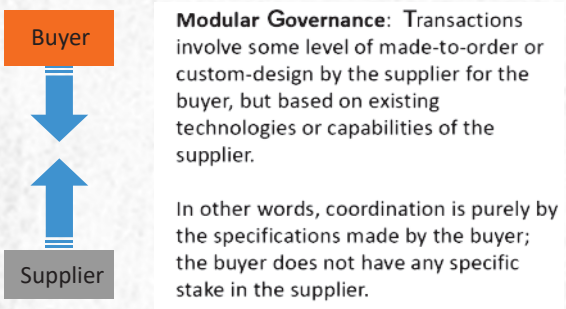
- Market-based
- Modular
- Relational
- Captive
- Hierarchy

Riisgaard et al., (2008) refine this somewhat, distinguishing between market, contractualization (horizontal or vertical), and vertical integration

Value Chain Governance



Source: Gereffi et al., (2005):89



Source: Gereffi et al., 2005

1. Gereffi, G, Humphrey, J, and Sturgeon, T. (2005) The Government of Global Value Chain Review of International Political Economy, 12 (1): 78-104

2. Riisgaar, L, Bolwing, S. and Matose, F. (2008) A Strategic Frame were and Tool Box for Action Research with small Produces in value chains, DIIS Winey paper 2008; 17, co Penichager: Danish Institute for International Studies

Relational Governance: transactions between buyer and supplier are more complex and involve mutual dependence.

They are often governed through various social, ethnic, or other informal ties.

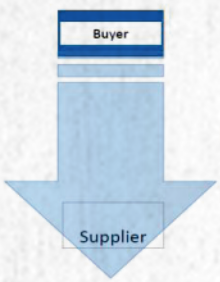
Source: Gereffi et al., 2005

Captive Governance: transactions between buyer and supplier are characterized by **the dependence of the supplier on the buyer for inputs,** materials, markets, etc. (Examples)

Significant supervision and monitoring exists in such governance structures

Source: Gereffi et al., 2005

Value Chain Governance



Vertical Integration: In such circumstances, **the supplier is directly owned by the buyer,** with transactions between buyer and supplier conducted **within the firm** itself.

Source: Gereffi et al., 2005

Governance in the Value Chain

- Types of coordination
- Arm's length (spot markets)
- Full vertical coordination (total integration of supply chain)
- Intermediate forms (contracts, etc. –in between arm's length and full coordination)
- It is useful to map governance relationships graphically too.

- Value Chain Governance is also about specific nature of the relationships between different links in the Value Chain, focusing on:
  - Who decides what is produced
  - The nature of production itself (inventories at each node)
  - How the rules of trade are determined
  - Power relationships
  - Roles of associations

3. Exploring areas of upgrading within the chain (Identifying opportunities for *upgrading* in the Value Chain)

Identifying opportunities for upgrading in the Value Chain

- **Matrix of Relations to Identify Problematic Interfaces,**
- The multiple interfaces of interactions along the value chain could be identified by forming a matrix of relations (Huppert & Urban, 1998)
- There are four essential levels of relations:
  - **Service Relations** (i.e. exchange of goods and services -S),
  - **Legal Relations** (i.e. laws and agreements regulating the exchange of goods and services-L),
  - **Power Relations** (i.e. dominance of one partner within the exchange relationship -P),
  - **Information Relations** (information flows accompanying all above relations-I).

		1	2	3	4	5	6	7	8
		Input suppliers	Farmers	Farmers Organizations	Collectors (village/Town)	Transporters	Commission agents/Wholesalers	Domestic Retailers	Exporters
1	Input suppliers								
2	Farmers	SIP	SIP						
3	Farmers Organizations		SIPL						
4	Collectors (village/Town)		SIP	SI	SI				
5	Transporters		SI	SIPL	SI				
6	Commission agents/Wholesalers		SI		SI	S			
7	Domestic Retailers					S	SI		
8	Exporters		SIPL	SIPL	SIP	S	SIP		ISP

S–Service Relations
L–Legal Relations

P–Power Relations

I–Information Relations

Identifying opportunities for upgrading in the Value Chain

- Ways to add value for specific actors in the chain
- Four types of upgrading are possible:
  - Product upgrading
  - Process upgrading
  - Functional upgrading
  - Chain upgrading
    - **Product upgrading**: improving existing products and/or developing new ones
    - **Process upgrading:** improving efficiency of internal and external processes within the chain
    - **Functional upgrading:** changing one's position within the chain to add value
    - **Chain upgrading:** moving to a new VC altogether.

Main Outputs:

- What are the opportunities for adding value in the chain?
- How do governance or other constraints influence this?
- What are the drivers for change?
- What are the incentives?

Tasks:

- What is the **Vision** for upgrading?
- Opportunities and constraints (SWOT analysis)
- Operational objectives for upgrading
- Actors involved in upgrading (role of governance important!)
- Impact of upgrading (related to step 4 on benefits)
- **Vision (in terms of improving processes, capacity, and relationshipsetc.)**
- Tells what we are going to achieved though upgraded VC–its *value proposition*
- Provides strategic direction and perspective –focus is on the competitive issues facing the VC
- Provides a basis for joint ownership and developing **Common Goals** among participants
- Tells us what **strategies should be implemented**
- Strategies-product, process, functional and chain upgrading (w/o losing the sight of governance)

Identifying opportunities for *upgrading* in the Value Chain (Porter's *Competitive Advantage*)

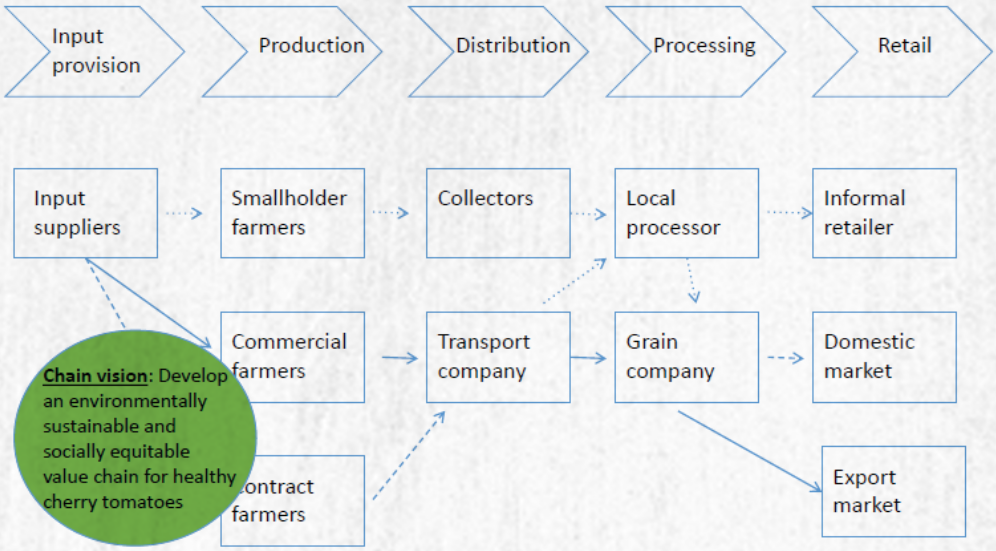
	LOWER COST	DIFFERENTIATION
BROAD TARGET	Cost Leadership	Differentiation
NARROW TARGET	Cost Focus	Differentiation Focus

Source: Porter (1980), figure 1-3

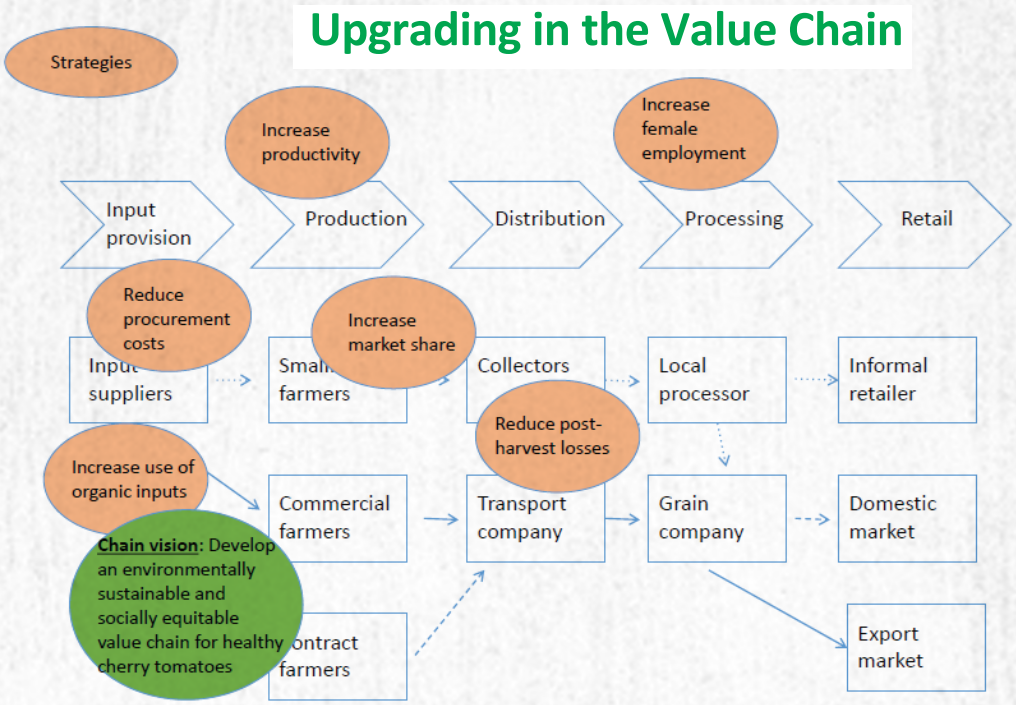
Identifying opportunities for *upgrading*in the Value Chain

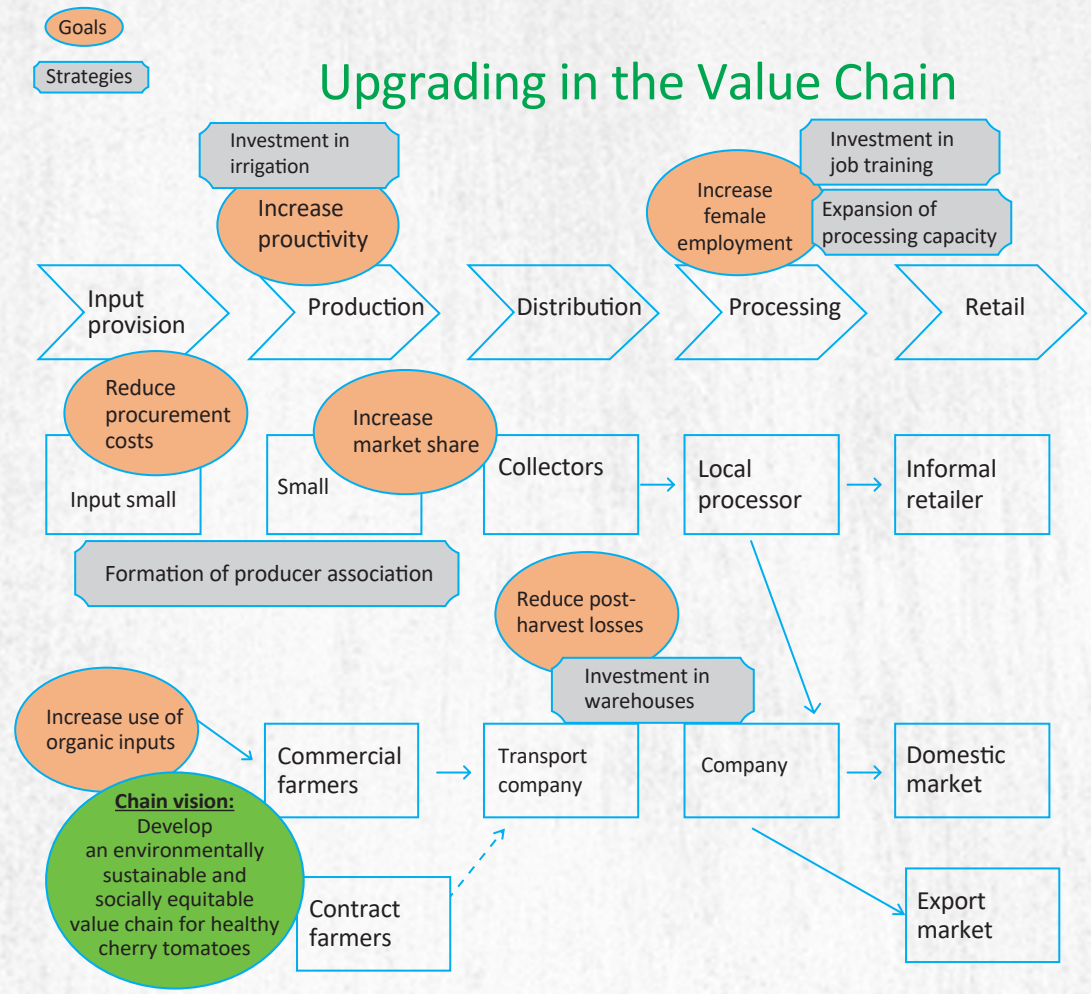
- Cost leadership: firm sets out to be thelow-cost leader, finding and exploiting allsources of cost advantage
  - Possible sources of cost advantage
  - Economies of scale
  - Proprietary technology
  - Preferential access to raw materials
- Differentiation: firm tries to be unique along some product dimension or attribute
  - Bases of differentiation can include:
  - Specific product attributes
  - Marketing approaches
  - Delivery systems
  - Key to a differentiation strategy is obtaining a price premium that is greater than the extra costs associated with differentiation.
- Focus: firm targets a particular segment and tailors products towards them
  - Idea is to obtain competitive advantage in its target segment, not overall.
  - Such competitive advantage can be along cost or differentiation lines

Upgrading in the Value Chain



Goals



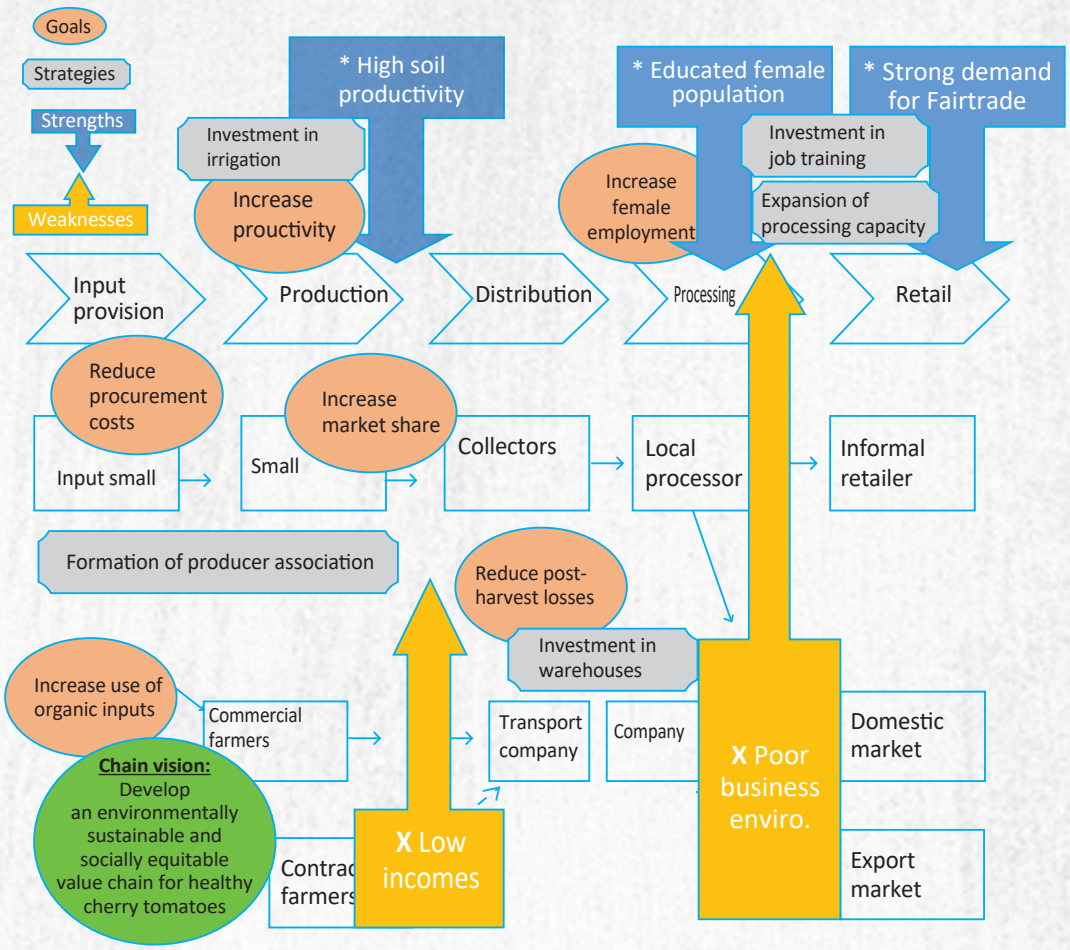


Identifying opportunities for *upgrading* in the Value Chain

SWOT Analysis to Understand the Context:

- Can be used to assess the opportunities and constraints present in a given chain to assess the capacity to engage in upgrading.

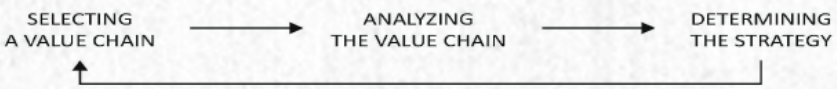
	Positive influences	Negative influences
Internal factors	STRENGTHS	WEAKNESSES
External factors	OPPORTUNITIES	CONSTRAINTS



Identifying opportunities for *upgrading* in the Value Chain

- For those engaged in value chain development, **operationalizing upgrading** is a key component.
  - Main ideas:
  - Identify and prioritize actions to be taken
  - Link enablers and enabling activities to upgrading strategies in the value chain
  - Identify "champions" in the chain itself to pursue such actions.

The process of value chain upgrading is an iterative one



Learning is an important part of the process!

Sustainability of Food Value Chains

- **Inclusiveness**
  - Equitable access to resources and markets and to having a voice in decision-making;
  - It relates to equitable distribution of the value added relative to the investments made and risks taken;
  - It amplifies the growth process through multiplier effects;
  - The exclusion of groups within the overall population;
  - Can lead to social unrest, which undermines the sustainability of the upgraded VC.

➢**Linked to the four economic impacts:**

(1). The number of smallholder producers and SMAEs that benefit from the upgrading strategy, i.e. that see their profits increase.

- It is not possible to include all (Different people have varying capacities/attitudes etc.)
- Start with most entrepreneurial/commercial farmers

To increase participation:

- Link up entrepreneurial/commercial farmers with the rest
- Targeted support
- Improved the enabling environment etc.

(2). The number and quality of jobs that are created as a result of the upgrading strategy

- Wage labour on farms that have upgraded
- Jobs further downstream (post-harvest handling, processing, logistics etc.)
- Jobs in those non-farm industries that benefit most from the spillover effects of increased income (e.g. local construction, small retail businesses and consumer services). (Pluriactivity/Portfolio entrepreneurship)
- Number of jobs vs quality of jobs (Number may decrease but quality would increase)

(3). Improved efficiency/performance of the food VC.

- Higher efficiency would increase food availability mainly to net buyers of food at lower prices on a reliable basis
- Reduced market gluts and price hikes/drops of food products (market certainty)
- More food choices for growing middle class
- Safer and more nutritious food for consumers at all levels

(4) Additional tax income generated by the upgraded VC (indirect)

- Used to assist those households that are excluded from commercial food VCs or remain stuck in low-paying or part-time jobs

- In addition to the number of beneficiaries all these four dimensions positively influence:
- Distribution in terms of gender, income, age, location (e.g. rural or urban) and educational level.
- The more disadvantaged groups can benefit the more socially acceptable and thus the more socially sustainable the outcome is.

Session 6

Catalyzing Private Sector Stakeholders to Collaborate and Improve the Vegetables Value Chain

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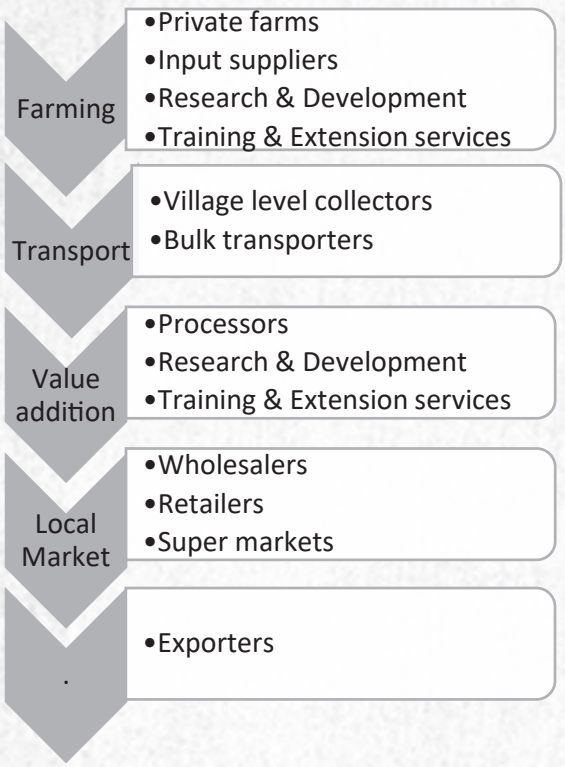
Why do we need Private Sector Contribution?

Importance of Private Sector

- Private sector contribution for agricultural value chain improvement is intensifying at present converting conventional agriculture into an agribusiness.
- Private sector performance in agriculture is advancing with technological implications, productivity enhancement and new market creation.

How does it spread over the Vegetables Value Chain?

Private Sector Involvement to the Vegetables Value Chain



What are the Challenges faced?

Barriers to Expand the Private Sector Contribution

- Fragmented and complex nature of value chain
- Proper financial services for innovative initiatives
- Appropriate technology adaptation
- Quality and safety issues
- Stagnated market
- Logistic management
- Poor value chain planning and regulation

How can we boost the Private Sector Contribution?

Catalyzing Mechanism

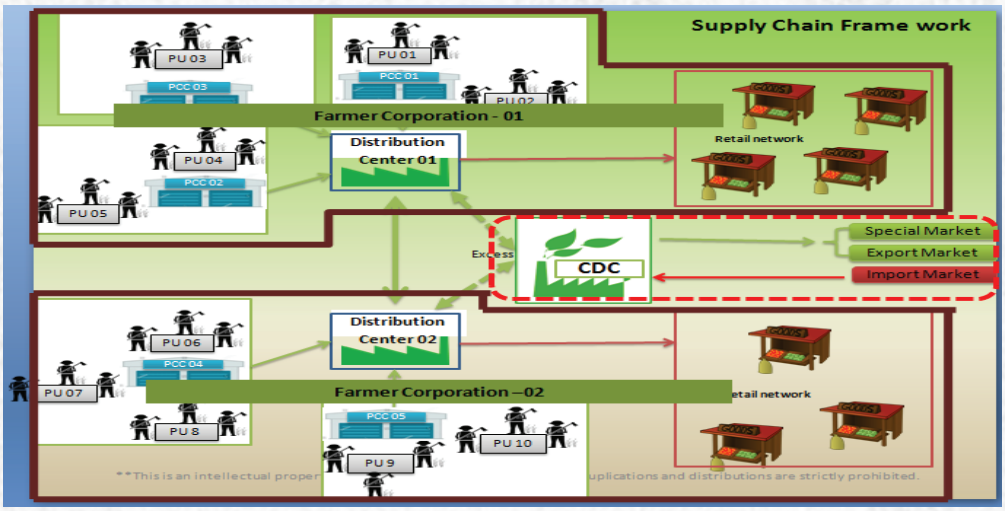
- PPPP(4P) Approach
  - important mechanism to facilitate and foster the participation of the private sector along with the government in order to ensure the marketability and profitability of the agricultural sector
- Appropriate Financial Instruments
  - should be available at each and every stage of the value chain in order to attain sustainability and innovative solutions
  - Setting up the perishable standards
  - creates local and international new market opportunities
- Technological Adaptations
  - Enhance productivity of operations and profitability of agribusinesses.
- IT inclusion for value chain management and stakeholder linkagegenerate more transparent, efficient and effective mode of operation.

Benefits of proper Producer – Public – Private Integration to the Vegetables Value Chain

- Productivity enhancement
  - Certified agricultural inputs
  - Mechanization
- Continuous supply
  - Planned cultivation
  - Protected agriculture
  - Climate change resilience
- Assured Quality

  - Freshness
  - Safe Handling
  - Safe Transportation
- Stable and affordable prices
- Market expansion
- Public demand creation
- Stakeholder capacity building
  - Infrastructure development
  - Awareness raising
  - Training and extension

How we do it?



PU: Production Unit. Each PU composed of 50 farmers who are involved only in crop production. All PU farmers are registered for GAP certification.

PCC: Produce Collection Centre. These centers are based in the village. Several Pus are linked with each PCC.

Distribution Centre: The DC is based in the district town. Several PCCs are linked with each DC. These canters are equipped with fully automated processing facilities, such as sorting, grading, cleaning, packaging etc. Each distribution center is linked with retail network.

CDC: Central Distribution Centre. CDC is linked with District level distribution centers and supply produces to special market or export market.

Farmer Corporation: It is composed of several PCC, one Distribution Centre and linked with retail network.

Strategies

– Price Management	– Import and Export Management
– Logistic Management	– Collaborative Research and Development
– Transport Management	– Collaborative Training
– Product Standardization and branding	– Marketing
– Crop Management	– Financial Management

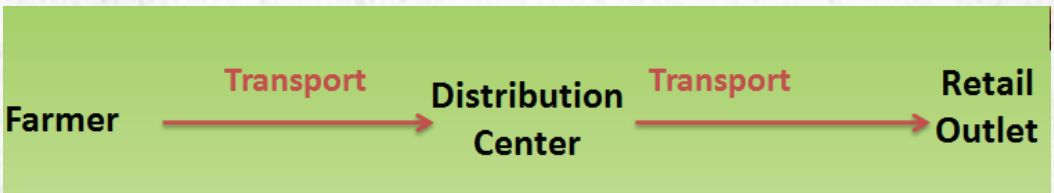
Price Management

- Farm gate Price = Cost of production + Profit Margin
- Center's Selling Price = Farm gate price + O, M & M Cost + Profit margin
- Retail Price = Center's selling price + Profit margin

Logistic Management

- Creates a centralized online platform for all the stakeholders using IT- based applications.
- The platform will be enabled to reach from farmer to consumer.
- All the transactions will be done using the e-platform.
- Maintenance of big data on agricultural produces: types of crop grown, production, post-harvest loss, quality, price, requirement etc.

Transport Management



- Transportation plays an important role to deliver the products with high quality in shorter time period.
- Reduction of average 22% transport loss.
- Cold conditioned vehicles will be used.
- Transport management system is essential to monitor and control the transportation process.
- Existing transporters will be absorbed to the system by facilitating to upgrade their vehicles.

CDC central Distribution centre linked with district level distributior centre and supply produces to special Market and export market

Farmer Corporation lampooned on served PCC, one Distribution center linked with retail Network

Crop Management

- Area wise crop recommendation to maximize the yield and profit.
- Variety improvement and value added product developments.
- Crop planning with a purpose of minimizing wastage due to surplus in production.

Product Standardization and Branding

- Product standards will be introduced based on the GAP, GMP and overall quality of the product.
  - EX: B, BB, BBB, A, AA, AAA
- Products will be marketed under the unique brand name.
- This will create suitable products to the export markets comply with the global standards.

Session 7

Economics of Vegetables Value Chains

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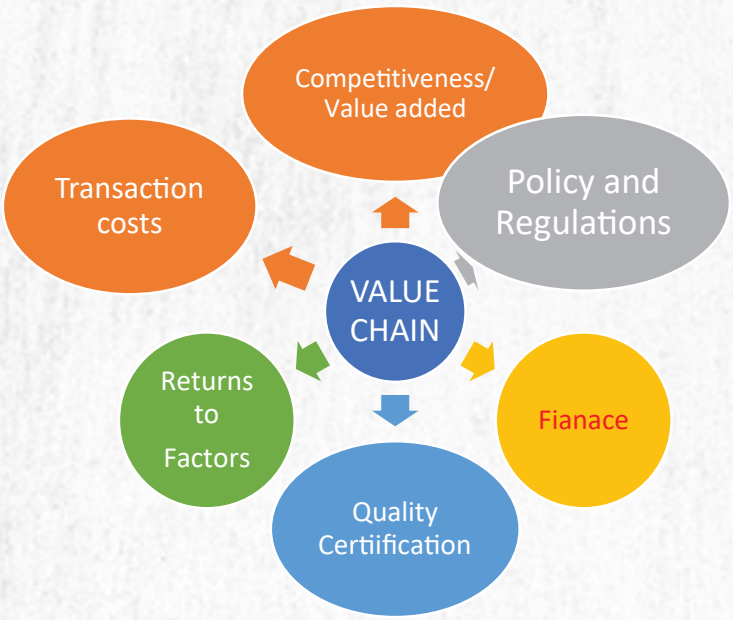
Part 1 – Concepts

1. Introduction:

There are number of commonalities and few differences across countries in South Asia with respect to Vegetables Value Chains (VVC). It is useful to take a brief look at the economic environment of a Value Chain at the outset.

Economic environment of a VC



Economic priorities of Vegebables Value Chains

The following concerns emerge as the economic priorities of value chains.

- Competitiveness
- Production costs vs. Value added
- Financing vs Return to Investments
- Benchmarking and Quality Premiums
- Policy

This unit will cover transaction costs and Value Chain finance followed by an example covering few examples of VVCs in Sri Lanka in terms of costs and margins at each stage of VC and an activity on generating key data on few leading VVCs from SAARC countries.

2. Transaction Costs (TC)

- Are these simply the costs of transacting?
- Transaction costs signify a trade-off between the costs of coordination (within an organization) and the costs of transacting/forming contracts in the market.
- The presence of transaction costs associated with information, negotiation, monitoring, coordination, and enforcement of contracts leads to intermediary firms emerging to economize on such costs (Coase,1937).
- High TCs lead to missing markets; for example, in credit markets (Besley, 1994), labor markets (Bardhan, 1984), and land markets(Carter and Mesbah, 1993)
- Transaction costs could be either **tangible** (i.e. transportation costs, communication costs, legal costs, etc.) or **intangible** (costs of uncertainty, moral hazard, etc.) (Joshi and Gulati, 2005).
- **Developments to tackle Transaction Costs:** The tendency is to move away from the spot markets to other forms of **vertical integration**.
- Open-access markets fail to meet consumer needs for **accurate information** on quality and safety attributes (Van der Vorst 2005).
- Another classification of TCs is between
  - Market TCs
  - Producer TCs

Market Transaction Costs

- In VVCs, usually a large number of sellers and few large buyers exist.
- Under these conditions, following types of transaction costs are more likely:
  - Costs associated with managing and coordinating integrated production, processing, and marketing
  - Opportunity cost of time used to **communicate with farmers and coordinate**
  - Costs involved in establishing and monitoring **contractual relationships**
  - **Screening costs** linked to uncertainties about the reliability of potential suppliers or buyers
  - **Cost of minimizing uncertainty** about the actual quality of the goods
  - In summary, there are actual **physical** and **informational** market TCs

Producer Transaction Costs

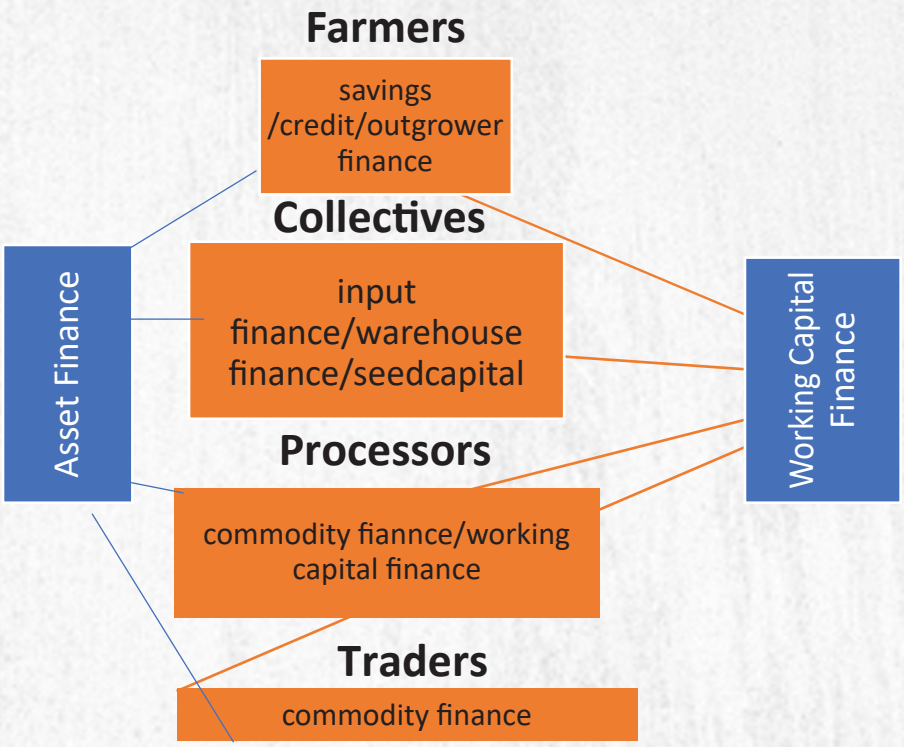
- **Costs of Participation** in vertically coordinated markets.
- These could occur in **INPUT Markets**: the best example is credit markets
- Also, **OUTPUT Markets**: farmers' search costs for brokers to access output markets if markets are distant.
- *Note: costs related to accessing **land and credit** are much more variable for women than for men (so there is a gender element to TCs).*

Solutions to TCs

- Networks (Social) may substantially reduce transaction costs.
- Information and education usually reduce TCs: private sector provision of market information via improved telecommunication.
- Contract farming.
- **Vertical Integration**: Contractual arrangements with supermarkets (*concern: large retailers pick winners and will not take the risks*).
- **Horizontal Integration**: cooperatives / farmer companies, labour and resource sharing (concern: leads to increased negotiating power but price is not a prime concern in Ag VCs. The key concerns appear to besecured markets and access to credit).

3. Value Chain Finance

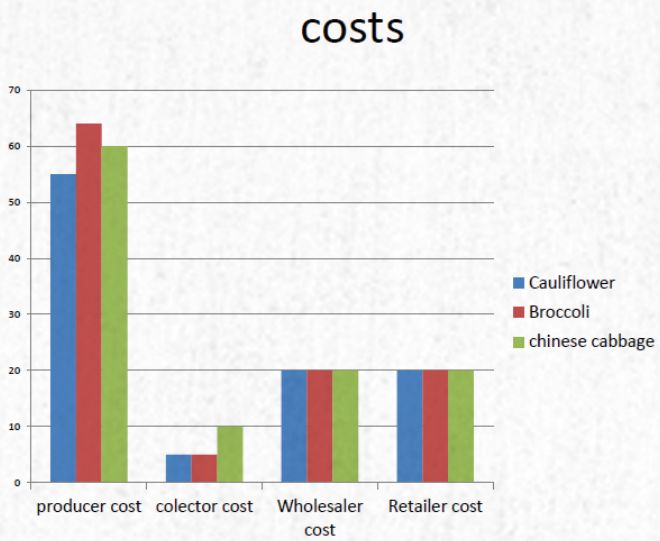
Value chain finance is often overlooked in the value chain literature but has crucial implications for South Asian vegetables value chains. In the following schematic diagram, the types of finances available to each stakeholder of the value chain are identified.

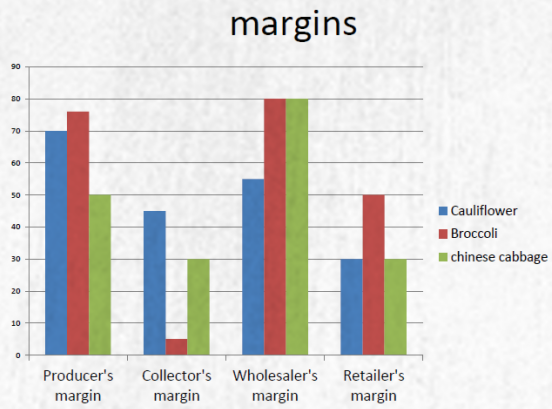


Part 2

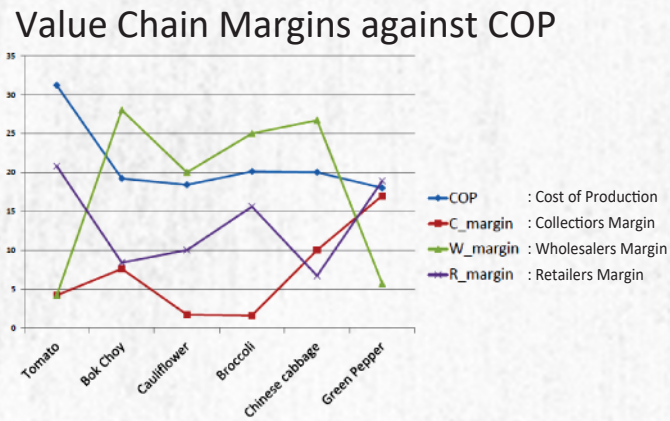
High value VVC in Sri Lanka

A brief Analysis of the Economics of Value Chains

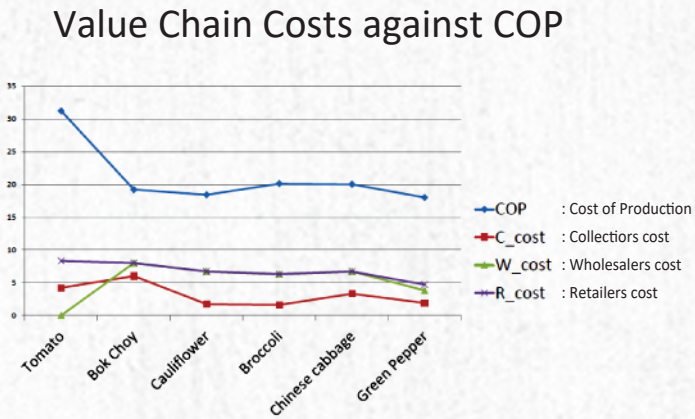




Comparison of margins for collector (C), wholesaler (W) and retailer (R) across high value vegetables (with reference to cost of production)



Comparison of costs for collector (C), wholesaler (W) and retailer (R) across high value vegetables (with reference to cost of production)



Group exercise: Economics of Vegetables Value Chain

- In the following handout, identify the approximate values for costs and margins for the most common vegetable VCs in the country.

Crop	bell pepper	cauliflower	broccoli	lettuce	tomato
Producer cost (% of retail)					
Producer margin (% of retail)					
Highest cost item (name)					
Highest cost item (% retail)					
Monthly variation (range)					
Spatial variation (range)					
Collector cost (% retail)					
Collector margin (% retail)					
Highest cost item (name)					
Highest cost item (% retail)					
Monthly variation (range)					
Spatial variation (range)					
Wholesaler cost (% retail)					
Wholesaler margin (% retail)					
Highest cost item (name)					
Highest cost item (% retail)					
Monthly variation (range)					
Spatial variation (range)					
Retailer cost (% retail)					
Retailer margin (% retail)					
Highest cost item (name)					
Highest cost item (% retail)					
Monthly variation (range)					
Spatial variation (range)					
Wastage					

Example:

Consider an example of the value chain for vegetable X. Assume the following prices. The farm-gate price is 110 per kg. The collector's cost is 5. Wholesaler buys from collector at 120. The cost of the wholesaler is 20. Retailer buys from wholesale agent at 150. The cost of the retailer is 5. Consumer buys from retailer at 160. Assume also the cost of production (COP) is 100 per kg.

The costs and margins can be calculated based on the above information as follows.

Stage of VC	Costs per kg	Margin per kg	Margin over Cost
producer	100	10	10%
Collector	5	5	100%
wholesaler	20	10	50%
retailer	5	5	100%

Report

Title of the program: Regional Training on "Safe and Sustainable Vegetable Value Chain Development in South Asia"

Host organization: Department of Agriculture (DoA), Sri Lanka

Date: 28 July to 01 August 2019

Partner: Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP)

Brief summary:

The five-day training was inaugurated with traditional Sri Lankan lamp lighting. This session was chaired by Dr. W. Weerakoon, Director General (DG), Department of Agriculture (DoA), Sri Lanka. Dr. Ajanthe deSilva, Additional Secretary, Ministry of Agriculture, Sri Lanka graced the session as Chief Guest. Ms. Jayantha MenikeIlankoon, Additional Director General DoA, Sri Lanka and Dr. .R.Punyawardene, Director, Natural Resources Management Centre, Department of Agriculture, Sri Lanka and Governing Body member, SAC were present as Special Guest and Guest of Honour, respectively. Dr.W. Wickramaarachchi, Additional Director, National Plant Quarantine Service, DoA, Sri Lanka and former Senior Program Specialist (SPS) SAC, Dr. Gaminisamarasinghe Director, Horticultural Research & Development Institute, DOA and Ms K. Ranathunga, Director, Extension and Training Centre, DoA were also present. On behalf of organisers Mr. George Babu, Program Officer, CIDAP, Dr. Nasreen Sultana, SPS, SAC and Ms. Disna Rathnasinghe, Deputy Director, DoA, Sri Lanka coordinated the program.

During his inaugural speech, Dr. Ajanthe deSilva, stated that global food markets are undergoing significant changes over time. Consequently, consumption of vegetables has increased many folds. Hence, it is high time for South Asian countries to enter global vegetables trade by developing capacity of stakeholders. Emphasizing the importance of vegetable in solving nutrition insecurity in SAARC Countries, Dr. Weerakoon expressed his thanks to SAC and CIRDAP for organizing this much-demanded training in his organization. Stressing on regional integration and free trade, Dr. Punyawardene, acknowledged that among SAARC Centers, SAC is working diligently and continuously proving itself as a centre of Excellence.

With the sharing of current status of vegetable value chain in their respective countries by the participants, technical part of the training started. Major topics covered during training are mentioned in the program schedule (Annexure 2). In addition, there was a round-table discussion, group works and two field visits.

Objectives:

1. To understand concept and guiding principles of vegetable value chain approach;
2. To understand roles of value chain actors and opportunity to create new market linkages.
3. To develop capacities for identifying competitive challenges for determine market requirements by value chain analysis.

Salient achievements:

1. Thirteen (13) professionals from six SAARC member states (Annexure Table 1) shared current status of vegetable value chain in their respective countries and learned from each other;
2. Participants got opportunities to learn concepts and guiding principles of value chain form renowned professors and practitioners involved in Agribusiness development and value chain management;
3. Participants exposed to market channels during field visits. They interacted with management;

Recommendations:

- Participants were highly interested in this Vegetable Value Chain training program, and have requested to increase the total number of days for training and to include more attendees.
- Due to high demand, the training may be repeated next year with different participants from member states in a different host country.

Lessons Learned:

- Vegetable Value Chain training is vital for regional trade development.
- Group-work allows for effective exchange of information between participants and works as a networking opportunity.
- Round table discussions among successful business and members of civil society organizations (Assistant FAO Representative, professors of business department, international development specialist) added more value to the trainings.
- Exposure visit and discussion with local stakeholders is highly effective.
- Participants are interested to transfer their knowledge from countries that have more advanced value chains to less advanced value chains.

List of Participants

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Programme Schedule

Day	Topic	Facilitator	Time
28. July 2019	**Inauguration**	Ms.Disna	
			9:00-10:15 am
	Guests take seats		9:00-9:05 am
	Lighting of Oil Lamp		9:05-9:10 am
	Welcome address-DoA	Ms. Disna Rathnasinghe	9:10-9:20 am
	Remark by DG-DOA	Dr. W.M.W. Weerakoon	9:20-9:30 am
	Address by SAC	Dr. Nasreen Sultana	9:30-9:40 am
	Chief Guest: Secretary, MoA	Dr. Ajanthe deSilva	9:40-9:50 am
	Vote of Thanks-CIRDAP	George Chandra Babu	9:50-10:00am
	Group photo		10.00-10.15am
	Tea/Coffee break		10:15-10:30 am
	Countries situation review on vegetable Value chain	Participants each 10 Minutes	10:30 am -12:30 noon
	Lunch		12:30-13:30 pm
	Understanding the concept and guiding principles of vegetable value chain	Prof Rohana Mahaliyanarachchi	13:30-14:30 pm
	Multi-stakeholder processes in AVCs/ Various tools in developing a vegetable/Agriculture value chain/ Value chain financing/Market analysis	Dr Udith Jayasinghe	14:30-15:45 pm
	Tea/Coffee break		15:45-16:00 pm
	Group work (concept and Multi stake holders involvement)	Prof Rohana Mahaliyanarachchi Dr Udith Jayasinghe	16:00-17:00 pm
	Safe and Sustainable vegetable production (online presentation)	Dr. Tahera Najnin,	17:00-18:00 pm
29.July 2019	Recap	CIRDAP/SAC	8:30-8:45 am
	Analyzing the structure and dynamics of value chains/ Value Chain Analysis: Structure of vegetable value chains	Dr. Patrick Nugawela	8:45-9:45 pm
	Tea/Coffee break		9:45-10:00 am
	Tools for value chain analysis/ Value Chain Actors mapping and tools for value chain mapping	Dr. Patrick Nugawela	10:00-11:00 am
	Approaches to setting up Agriculture value chains/ Developing value chain strategies to overcome constraints and increase competitiveness	Prof. Sarath Kodithuwakku	11:00 am -13:00 pm

Day	Topic	Facilitator	Time
	Lunch		13:00-14:00 pm
	Catalyzing private sector stakeholders to collaborate and improve value chain	Mr. Kavinda Dissanayaka	14:00-15:00 pm
	Increasing the inclusiveness of market systems-Approaches-Gender	Prof. Sarath Kodithuwakku	15.00-16.00 pm
	Tea/Coffee break		16:00-16:15 pm
	Economic analysis of vegetable chain	Dr P. Prasada	16:15-17:15 pm
	Group work with working tea (Economic analysis of vegetables chain)	Dr P. Prasada	17:15-19:00 pm
30 July 2019	Field Visit-NuwaraEliya	Ms. Disna	Starting 7:30am Return to Peradeniya hotel
31 July 2019	Field visit- Dedicated Economic Centre in Dambulla	Ms. Disna	Starting 7:30am Return to Peradeniya hotel
01.Aug 2019	Recap	CIRDAP/SAC	8:30-9:00 am
	Effective public policy management in AVCs/ Stakeholders' roles and responsibilities/ Gain insights into the respective actor roles in the value chains/	Dr Chathura Rodrigo Dr Martin Markhof	9:00-10.00am
	Tea/Coffee Break		
	Group Work (sharing the experiences)	Participants	10:15-11:45 pm
	Round Table Discussion	Dr W. M. W.Weerakoon, Dr.D.B.T. Wijeraene, FAO AAFOR, Sri Lanka, Prof. Sarath Kodithuwakku, Dr. Patrick Nugawela	11:45am-13:00 pm
	Certificate Awarding and Closing	DG DoA	13:00-13:30 pm
	Lunch		
	Sight Seeing		

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