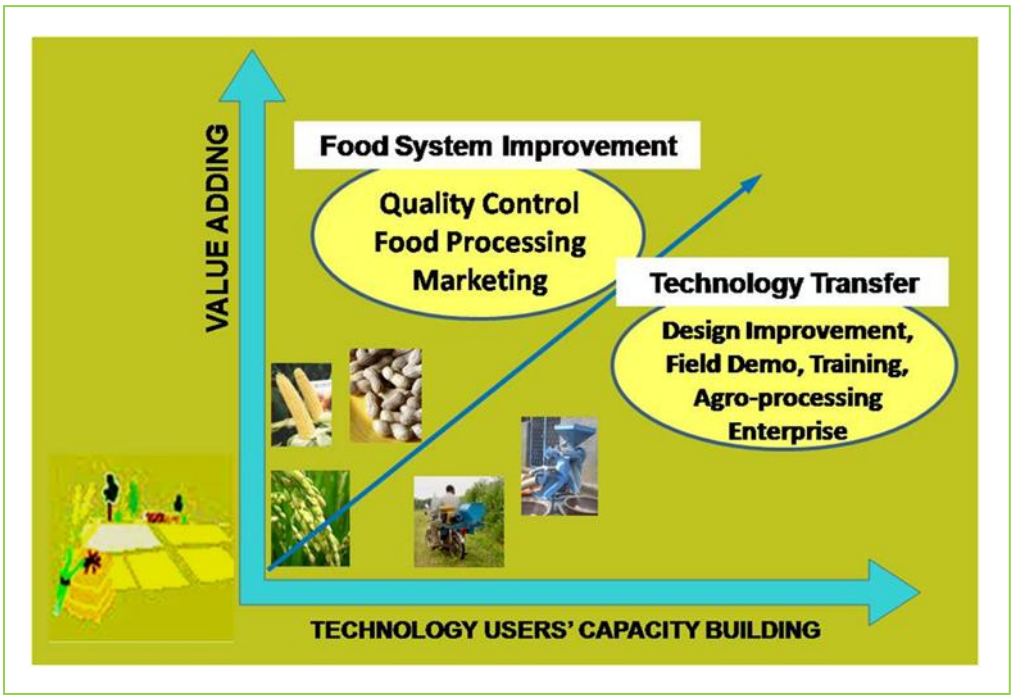
Sasakawa Africa Association

Value Chain Analysis for the Development of Food Systems and Innovative Agro-based Industry in Africa

Toshiro Mado & Kyoko Saio



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Book 1-

Value Chain Analysis for the Development of Food Systems

by:

Kyoko Saio, PhD

Book 2-

Value Chain Analysis for the Development of Innovative Agro-based Industry in Africa

by:

Toshiro Mado

FOREWORD

Agriculture and food production and distribution in the developing world is undergoing major structural changes caused by changing and diverse consumer demands, new technologies (especially information technologies), new product characteristics, changing firm sizes and more exposure to world markets… the structural realignment in agriculture and the formation of new supply chains are partly a response to increasing concerns by food processors, retailers and food service companies about food safety, health and nutritional issues.

Globalization of markets ties the sustainability of small and large firms to the competitiveness of the industries in which they participate; at the same time, inter-firm cooperation and coordination is crucial to competitiveness and relationships among firms in a *value chain* can influence the distribution of learning and benefits. Knowledge and innovation are essential for creating and sustaining competitiveness and the *Value Chain Approach* identifies the opportunities and constraints to growth in a particular industry and takes the additional step of identifying the factors that drive firms' behavior in markets.

Another major reason for the formation of *value chains* is to reduce costs, particularly transaction costs, in order to promote competitiveness. Thus, attempts to satisfy changing consumer demands and to lower costs, including transaction costs, drive efforts to enhance the competitiveness of agro-food value chains. Furthermore, value chains allow one to understand what is changing? How is it changing, why is it changing? Who is becoming more competitive? Why? What are the supporting services and influencing factors? It is essential to take into consideration the dynamics to identify future potential of the value chains and appropriate role for assistance and determine and design appropriate interventions for target value chain markets.

As argued by Reardon et al(2007), value chain strategies are closely linked with the 'supermarket revolution', which, in developing countries was due not only to the build-up of demand factors (on the demand side, they highlight factors such as urbanisation, income growth, the diffusion of refrigerators and motor cars, which are in themselves the result of trade liberalisation and manufacturing sector growth in developing countries, and better road and bus infrastructure); but also due to other economic actors, much like the types of change taking place in the other sectors of the economy.

I have no doubt this book will add value to the understanding of the value chain approach in agriculture, especially in the agro-food industry. I congratulate the Authors: *Mado & Saio*, for a job well done.

Juliana Rwelamira
Managing Director
Sasakawa Africa Association

SUMMARY

This book consists of two separate but related accounts in the development of the food systems and agro-based industries through value chain analysis. It describes the changing food preferences of the consumers, the distribution patterns and their impact on food demand, production and markets.

Book 1- Development of Food Systems

Kyoko Saio draws on the Japanese and western experiences where rapid industrialization of the food industry since the 1950s, changes in distribution channels, developments in food preservation and distribution technologies, as well as people's lifestyle have radically altered the flow of food commodities from production to consumption.

Some notable strategies that worked in improving the food systems in Japan and other developed countries were:

- One-village-one product (OVOP) movement where a specialty product is identified for a locality and is developed into a business enterprise;
- Rural production; rural consumption (RPRC) scheme which helps support nascent efforts of rural communities to help themselves. Farmers sell their products and value-added processed items through farmers' markets in towns, or through direct marketing schemes in schools, factories, offices and restaurants in the local areas. The philosophy behind the scheme is that local products are consumed in the local areas. The size of the local market is enlarged through the interaction of producers and consumers, and by the establishment of direct sales outlets for agricultural products, such as schools or local restaurants. This reduces the gap between producers (farmers) and consumers;
- Service provision and contract farming enterprise, as in the case of the *Angkor Kasekam Roongroeng* Rice Mill in Cambodia, increase the productivity of the farmers by gaining access to essential farming inputs and processing services.

Saio further notes that the development of food system in Africa will depend on stable markets for farmers, modern transportation and communication networks, and attention to quality control. The government and related institutions shall support agriculture-led industries in villages or local communities, politically and financially.

SUMMARY

Book 2 - Development of Innovative Agro-based industries in Africa

Toshiro Mado describes the SAA/SG2000 experience on the dissemination of postharvest and agro-processing technologies. Mado describes the constraints of producers in accessing markets for their produce. The agricultural market channel shows that the further down the market channel, agricultural products go, the less the control producers have over quality and price. Conversely, the closer to the consumers the product gets, the more quality control is needed. The challenge for producers (farmers) is how to apply quality control down to the end of the long, complex channel from rural farms to major city markets.

The participatory value chain analysis is a powerful tool which he advocates to apply to facilitate integration of the value chain activities and actors. The vertical integration links to the other levels of market in the supply chain while horizontal integration extends the same level of market geographically to increase volume.

SAA/SG2000 agro-processing program applied value chain analysis to understand the constraints and demand requirements of consumers and markets. It has helped to develop partners into more active chain players.

SAA/SG2000 agro-processing program is working to develop agro-based industry through the establishment of support systems that builds the capacity of technology-users to add value to their crops. The introduction of improved and appropriate technologies builds up the capacity of the technology-users, brings about improve value of the products and improves the food system.

ACRONYMS AND ABBREVIATIONS

AATIC	*Asia-Africa Trade and Investment Conference*
AERI	*Agricultural Extension Research Institute (Ethiopia)*
ARI	*Agricultural Research Institute (Ethiopia)*
AU	*Africa Union*
CIAT	*Centro International de Agricultura Tropica*
CREP	*Caisse Regionale d'Epargne et Prêt*
ECA	*Economic Commission on Africa*
EIAR	*Ethiopian Institute of Agricultural Research*
GTZ	*Deutsche Gesellschaft für Technische Zusammenarbeit*
IITA	*International Institute of Tropical Agriculture*
IRRI	*International Rice Research Institute*
JICA	*Japan International Collaboration Agency*
MAFF	*Ministry of Agriculture, Forestry and Fisheries (Japan)*
MoARD	*Ministry of Agriculture and Rural Development (Ethiopia)*
NARC	*National Agricultural Research Center (Japan)*
NERICA	*New Rice for Africa*
NFRI	*National Food Research Institute (Japan)*
OSC	*One Stop Center (in Uganda)*
OVOP	*One Village One Product*
PDM	*Project Design Matrix*
QPM	*Quality Protein Maize*
RPRC	*Rural Production, Rural Consumption*
SAA	*Sasakawa Africa Association*
SAP	*Structural Adjustment Program*
SG2000	*Sasakawa Global 2000 (An Agricultural Extension Project)*
SNNPR	*South Nations Nationalities Peoples' Region (in Ethiopia)*
SNV	*Netherland's Development Organization*
SSA	*Sub-Saharan Africa*
TICAD	*Tokyo International Conference on African Development*
TMFTC	*Tokyo Metropolitan Food and Technology Center*
UNDP	*United Nations Development Program*
UN-OSSA	*United Nations Office to Special Advisor to Africa*
USAID	*US Agency for International Development*
VCAM	*Value Chain Analysis Matrix*
VCAM	*Value Chain Analysis Matrix*
VSO	*Voluntary Service Overseas*

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Book 1-
Value Chain Analysis for the Development of Food Systems

by:

Kyoko Saio, PhD

Dr. Kyoko Saio is a Japanese Scientist in the field of Food Science and Nutrition. She is a Resource Person with the Postharvest and Agro-processing Program of Sasakawa Africa Association (SAA), Addis Ababa, Ethiopia. She is currently a Lecturer at *Aikoku Gakuen* College, Japan. Before these, she held various important positions in National and International Research and Development Institutions in Agriculture and Food Industries:

2001-2004 -Senior Overseas Volunteer to Cambodia of the Japan International Cooperation Agency (JICA), Japan/Cambodia

1995-2001-Trustee of the Board of International Institute of Tropical Agriculture (IITA), Nigeria

1994-2001-Director of Tokyo Metropolitan Food and Technology Center; (TMFTC), Japan

1992-1994-Deputy Director General of the National Agriculture Research Center (NARC) of the Ministry of Agriculture, Forestry, and Fisheries (MAFF), Japan

Until 1992, she worked as Researcher with the National Food Research Institute (NFRI) of MAFF, Japan.

About the Author

Book 2-
Value Chain Analysis for the Development of Agro-based Industry in Africa

by:

Toshiro Mado

Mr. Toshiro Mado is a Specialist in Agricultural Economics and Development Planning from Tokyo, Japan. He is currently the Director of the Regional Program on Agro-processing Technology Dissemination of the Sasakawa Africa Association (SAA) based in Addis Ababa, Ethiopia.

From 1994, Mr. Mado was a Program Officer (Postharvest and Agro-processing Extension) with SAA, Ghana until his appointment as Director of the Program in 1999.

Book 1-
Value Chain Analysis for the Development of Food Systems

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Kyoko Saio, PhD

I. What is Food System?

The food system is a relatively new concept which refers to the chain, or linkages that begin with agricultural production (the farmer) and end with food consumption (the consumer). The flow from production to consumption can vary depending on the socio-economic context in which agricultural products are distributed, processed, marketed and consumed.

Rapid industrialization of the food industry since the 1950s, changes in distribution channels, developments in food preservation and distribution technologies, as well as changes in people's lifestyles have radically altered the flow from production to consumption. The food system has changed enormously in the post-war years as the concept of the 'food system' has become widely established in food policy and research. Concerns about sustainability have introduced issues of the treatment of food waste into the study of food systems.

The flow from production to consumption is shown in Figure 1, in which commodities move down the chain as information moves up the chain.

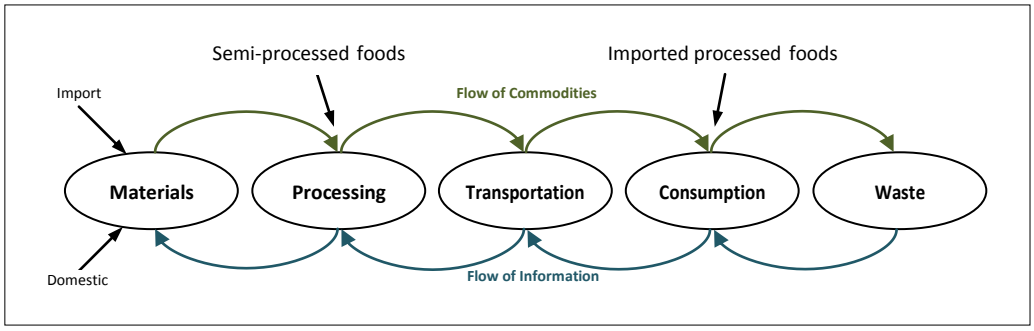

Figure 1 - Flow of commodities and information in the food system

II. Historical Changes in the Food System

Historical changes in the food system can be divided roughly into three phases. Phase one is when the self-sufficient community changes into a modern industrial society. Phase two sees the development of a large, complex food industry, distribution mechanisms and a corresponding rise

in the standard of living brought about through the evolution of technology. Phase three features the onset of issues of sustainability. People have enjoyed diverse and abundant food supplies but must face issues such as waste disposal, food-borne diseases, chemical contamination and so on.

Traditional food processing methods such as slaughtering, fermenting, sun drying, preserving (with salt, sugar or vinegar, or by roasting, smoking and baking) date back to pre-historic times. Modern developments in food-processing technology, including vacuum or can bottling, date from the 19th and 20th centuries and were driven largely by the needs of the military. The end of World War II saw rapid transformations of food-processing technology and of consumers' lifestyles which contributed to the growth of food processing as a big food industry.

The food industry is made up of three overlapping domains: food processing (manufacturing), food distribution and food service (Figure 2). For example, a buckwheat noodle shop (food service) makes the flour in an adjoining factory (food processing), a part of which is sold to other shops (food distribution). In the food industry, ingredients such as oil, flour, milk, starch, sugar and condiments involve large-scale industries; whereas processing these ingredients usually involves small- to medium-scale industries. This is the reverse of the flow in heavy industry such as cars or electric machines, where small parts are mainly fabricated in small- or medium-scale companies and final products in large-scale companies. In the food industry, therefore, small- and medium-scale companies can co-exist with large-scale ones.

Figure 3 shows how the food industry supports or is supported by many other industries, for example, the packaging and transport of food, the machines involved in manufacturing foods on a large scale, domestic electrical goods such as refrigerators and ovens, the IT and communication industries to deal with foods and so on.

A much more complex food industry has evolved since the 1980s, in response to changes in consumers' lifestyles. Specialist retailers of old – the greengrocer, the butcher, the fishmonger – have almost disappeared and been replaced by large supermarkets. The steady rise in the level of incomes and the increased participation of women in the work force, have contributed to the decline of home-cooking and its replacement with meals eaten in restaurants or from take-aways. This trend is called Home Meal Replacement (an American term) which means essentially that the

food industry in its different guises provides most of our meals at home and outside the home (sees Figure 4). Most food is bought in out of town supermarkets which offer one-stop shopping, with convenient parking, long opening hours. Shopping on the internet is also on the increase. Ready-to-eat foods such as washed and cut vegetables and frozen food (often of the cheap imported variety) are increasingly popular (Figure 5).

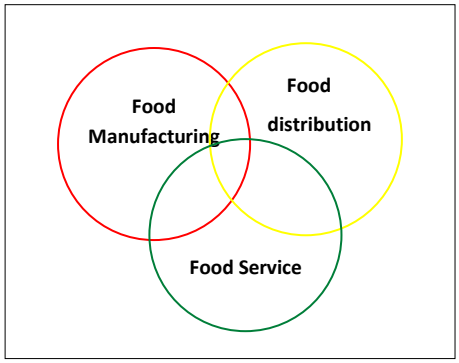

Figure 2 - The construction of the Food Industry

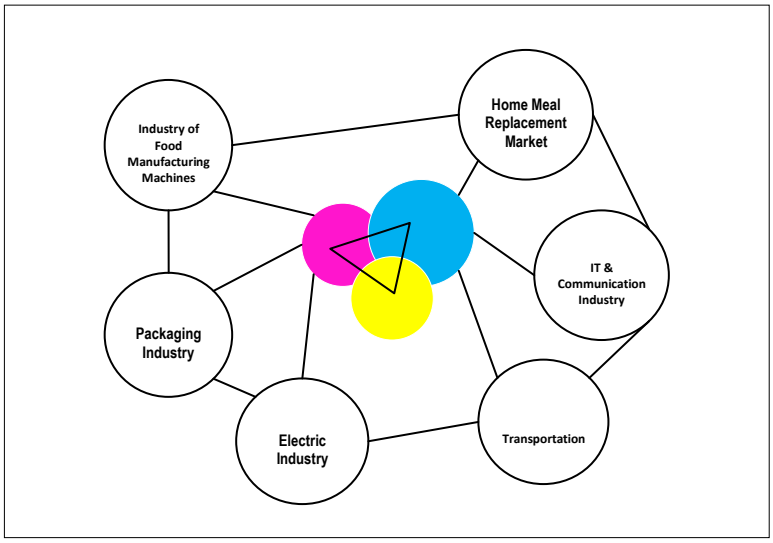

Figure 3 - Industries related to the Food Industry

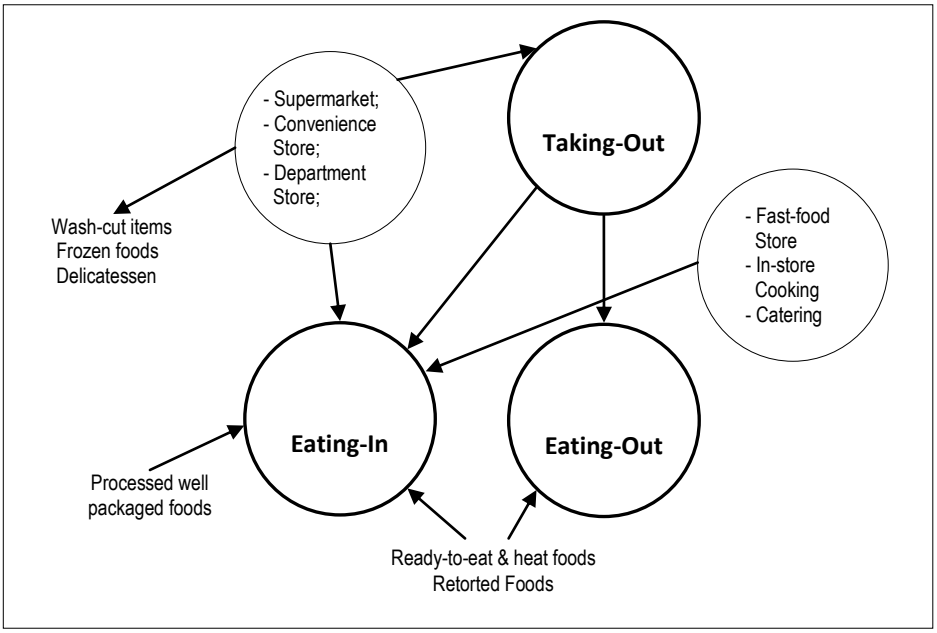

Figure 4 - Home Meal Replacement

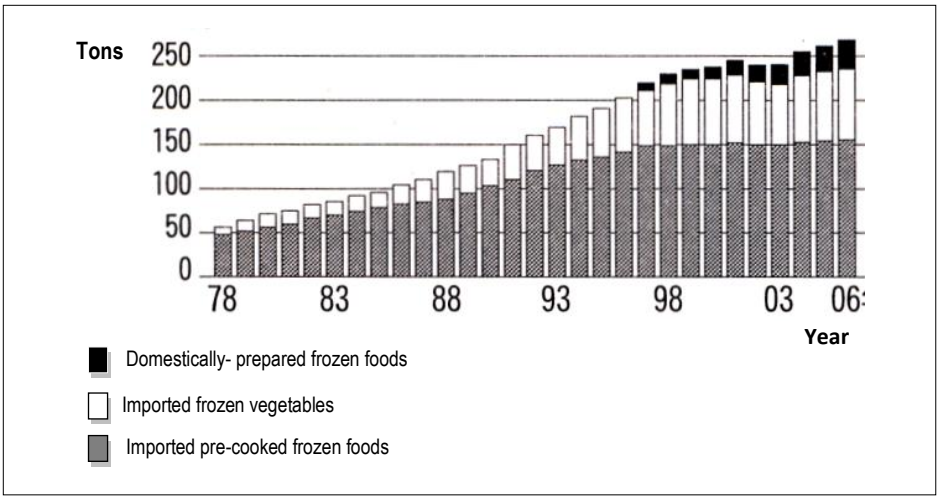

Figure 5 - Changes in domestically-prepared and imported frozen foods in Japan

The move away from classical distribution systems in which commodities move from wholesale to retail to consumer, have been replaced with complicated distribution systems, where retailers such as restaurants, supermarkets or convenience stores, buy direct or from domestic or foreign producers. Some also produce food materials or processed items

themselves, co-operating closely with farmers or food industries in Japan or abroad. Figure 6 shows the steady increase in the take-out markets from 1991-2001.

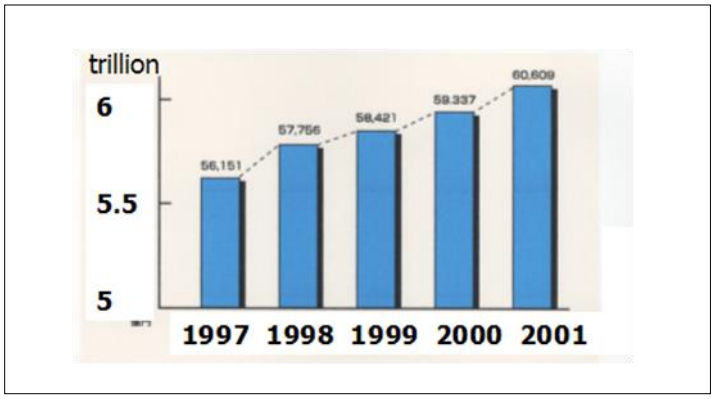

Figure 6 - Changes in taking-out market during 1997 -2 001

In the old times, one buys food ingredients at specials shops (many retail sales such as Green Grocer' Shop, meat shop, fish chop, etc.) and cooked by themselves at home (eating-in). But changes in consumers' society which increase in their income, increase in working women and making time for pleasuring, markedly increased eating-out (eating at a variety of restaurants and institutional facilities for providing meals). In the next stage, simple patterns which one selects eating-in or eating-out have added to another pattern, namely, taking out.

Eating-out markets have first increased since 1980s but reached at almost plateau and take-out markets have followed to increase. The market structure has markedly changed since the shortages of the post-war period. The main changes are summarized in Table 1.

During the second phase, although there are abundant and cheap food supplies, the food system in this phase is characterized by unsustainable practices, and the gap between the producer and consumer widens. The Japanese government has highlighted the following unsustainable practices in the food system:

1. Increase in irregular eating habits and reliance on nutritionally unbalanced meals
2. A lack of proper concern for food
3. Rise in obesity and lifestyle-related diseases
4. Outbreak of incidents related to food safety

5. Over-dependency on food resources from abroad
6. Declining agricultural population and ageing agricultural workforce
7. Decrease in vitality of rural areas

Table 1- Changes in market structure in times of shortage versus surplus

Balance of demand and supply	**Consumers' needs**	**Important points of production and distribution**	**Food distributors suitable to the trends**
Shortage	Adequate supplies Reasonable price Large-scale production & consumption	Efficiency Decrease in cost Mechanizing Standardization	General market (GMS)
Surplus	Quality of supply; Quality of service Diversifying goods	Originality; Diversified in small-scale Importance of human source & technology	Supermarket (SP) Convenience Store Special Store Mail Order Selling

Concern with the economic, social and environmental impact of the developed world's modern food system has been recognized also in Europe and the United States. The concept of **food miles** was proposed by a British activist in 1994. Food miles refer to the energy consumption and CO^2 emissions involved in transporting and importing food. Figure 7 shows the increase in imported foods on Japan's ratio of food miles compared to other developed economies.

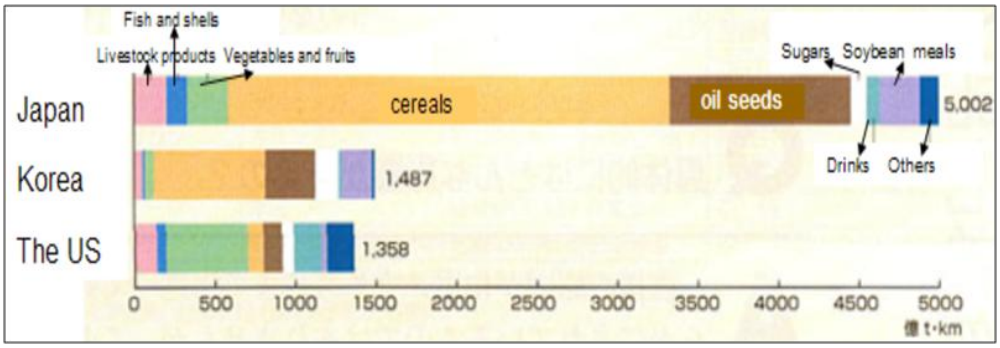

Figure 7 - Food miles of Japan compared with those of Korean and the US

Community-supported agriculture, such as farmers' markets and other means of rural development can not only improve a nation's energy consumption but can increase food safety, as well as perceptions of trust in the national food systems.

III. Marketability

Figure 8 illustrates the concept of marketability. During Phase One, especially in times of shortage, consumer and market needs in terms of the supply of agricultural products in the food system are focused mainly on quantity. As the supply of agricultural products grows, the quality of the produce becomes more important. Issues such as color, size and freshness affect the price. With the development of modern merchandising, the quality of foodstuffs important in the processing of agricultural products becomes significant. For example, increased supply of soybeans in turn affects demand for oil for oil milling. The demand for particular kinds of wheat – hard, intermediate, soft – is dictated by food industry actors involved in making English bread, noodles and biscuits (Figure 9).

In phases two and three, health and safety concerns give rise to additives such as vitamins, minerals, or polyphenols. Marketability can be affected by production practices such as the use of agricultural re-agents, or by farm level post-harvest management, as well as by distribution management and by the genetic or environmental quality of crops.

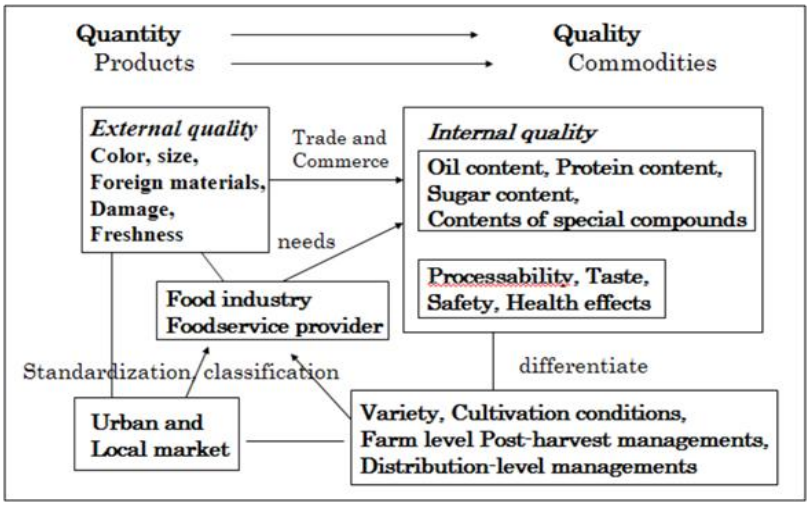

Figure 8 - Concept of marketability with focus on quality

	Hard	Intermediate	Soft
Quality of gluten	Large ←		→ Small
Quality of gluten	Strong ←		→ Weak
Particle size	Course ←		→ Fine
Kinds of wheat	Hard red spring, durum, hard red winter	Soft red winter	White
Main uses	Breads, Chinese noodle, pizza, Udon (noodle), cakes, biscuit		


Figure 9 - Relationship between quality of protein and uses of wheat

IV. The Food System and New Technology

Developments and innovations in the technology associated with the food system have served to increase food miles. Leaving aside food industry innovations such as biotechnology or genetic modification, the staggering number of strictly food system related technology includes:

1. Technologies for storage and preservation – low-temperature storage, controlled atmosphere (CA) storage, high-speed cooling,

frozen storage, processing of fresh fish in boats, pasteurization and sterilization, packing technologies, preservatives

2. Technologies for transportation – cold chain distribution, transportation by refrigerator cars, planes and boats
3. Technologies for processing: freeze-drying, spray-drying, microwave drying, frozen grinding, membrane filtration, high-pressure processing
4. Changes in food distribution: ready-to-eat foods, frozen foods, vending machines, family restaurants, convenience stores, internet selling

These technological innovations, especially freezing technologies with high-speed packing, make it possible to transport fresh food long distances – quality may increase but so do food miles.

V. The Food System and Rural Development

The de-population of rural communities; food safety fears among urban consumers; poor nutrition, diet and eating habits; and increasing concerns about environmental sustainability have given rise in Japan to a quiet revolution in favor of local and regional food systems (community food systems).

An earlier version of such a movement – the One Village One Product Movement (OVOP) – was initiated in 1979 by the former governor of Oita Prefecture, Morihiko Hiramatsu.

1. One Village One Product (OVOP)

OVOP originated in Oita prefecture in northern Kyushu, Japan. Facing the Suo Sea and Bung Strait of the Pacific Ocean, the prefecture is dominated by complex mountain areas and features an irregular coastline around Beppu Bay and Cape Kuji. The small coastal plains are the most populous in the region. The mountain areas were further de-populated in the 1970s when large numbers moved to the big cities of Tokyo, Osaka and Oita (the prefectural capital).

Hiramatsu, Governor of Oita Prefecture from 1979 to 2003, started this strategic movement in 1980 in all of Oita's 58 cities, town and villages. Its primary aim was to prevent de-population and the loss of rural activity in the region, and to identify and support local products unique to particular regions to help promote the autonomy and pride of regional residents.

OVOP was first proposed in a speech to regional leaders and then promoted through the mass media. Research and guidance facilities (e.g., Agricultural Technology Center, Mushroom Research and Guidance Center, Livestock Experimental Station, Institute of Marine & Fisheries Science etc.) were established for teaching support and the training of regional leaders. OVOP products were distributed and sold on a preferential basis throughout the region and success was rewarded by the Prefecture government. The principals of the movement were:

1) Local yet Global,
2) Self-reliance and Creativity, and
3) Human Resource Development.

In 20 years, the number of OVOP products has grown to 338 local specialties, 148 facilities, 133 cultural items, 111 revitalized regions and 80 items related to environments. Products such as *Shiitake* mushrooms (with 28% of the domestic market share, about 1,400t), *Kabosu* limes which are unique in Oita Prefecture (about 6000t), greenhouse mandarins (9.2%, about 5,600t), high-quality *Bungo* beef and *Seki-Aji* (horse mackerel) and Oita barley spirits flavored with *Kabosu* juice, are famous. Some smaller towns, with populations of less than 10,000 – *Yubuin, Kuju, Naoiri* – have become known not for specific local commodities but for the successful development of natural environmental sources such as hot springs.

The success of the OVOP movement has brought Oita Prefecture international recognition. The region annually hosts groups of government officials and specialists from abroad. Listed in Table 2 are a number of emulators of the OVOP movement worldwide.

Table 2 - Emulators of OVOP Movement in Asia and the USA

Project Name	Location
1. One Factory One Product	Shanghai, China
2. One City One Product	Shanghai, China
3. One District One Product	Shanghai, China
4. One Village One Treasure	Wuhan, China
5. One Town One Product	Jiangsu, China
6. One Capital One Product	Jiangsu, China
7. One Village One Product	Shanxi, China
8. One Village One Product	Jiangxi, China
9. One Barangay One Product	The Philippines
10. One Region One Vision	The Philippines
11. Satu Kampung Satu Produk Movement	Malaysia
12. Back to Village	East Java, Indonesia
13. One Tambon One Product Movement	Thailand
14. One Village One Product Movement	Cambodia
15. Neuang Muang Neuang Phalittaphan Movement	Laos
16. Neg Bag Neg Shildeg Buteegdekhuun	Mongolia
17. One Village One Product Day	Los Angeles, USA
18. One Parish One Product Movement	Louisiana, USA

- ***OVOP Projects in Africa***

  The government of Japan – from the Prime Minister, Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry and JICA – supports OVOP projects in developing countries as in Asia and Africa. The campaign focuses on bringing cultural products from developing countries in Asia, Africa, Oceania and Central America to markets in Narita, Kansai and Central international airports and Kobe and Haneda Airports.

  OVOP movements in Africa have grown, with seminars such as the one held in February 2007 at the Ethiopia Institute for Agricultural Research (EIAR), Addis Ababa and, more recently, a JICA (Japan International Cooperation Agency) sponsored investigation into the OVOP

movement, in co-operation with the Ministry of Agriculture and Rural Development in Ethiopia, the World Bank and the Embassy of Japan.

These trends are backed by Japanese policy including TICAD, the Tokyo International Conference on African Development, a series of conferences held every five years since 1993. The co-organizers of TICAD are the UN (OSSA - Office of the Special Advisor on Africa) and UNDP (United Nations Development Programme). TICAD was launched to promote high-level dialogue on policy between African leaders and development partners. Since its inception, TICAD has provided fundamental and comprehensive policy and guidelines on African development.

In the early 1990s after the end of the Cold War, when so-called 'aid fatigue' set in, Japan launched TICAD to re-focus international attention on the importance and urgency of African development issues. Japan has stressed the importance of African ownership of its own development, as well as of the partnership between Africa and the international community. A central feature of TICAD is the co-operation between Asia and Africa.

TICAD IV (2008) aimed to mobilize the knowledge and resources of the international community in the core areas of boosting economic growth, ensuring human security by achieving the Millennium Development Goals (MDGs) and the consolidation of peace, and addressing environment and climate change issues. TICAD IV was linked with G8 *Hokkaido Touyako* Summit.

Boosting economic growth requires the development of infrastructure to support trade and investment, and developing agriculture (irrigation, marketing, R&D). Achieving the Millennium Development Goals includes community development programmes (such as OVOP), the comprehensive development of agricultural areas, education and welfare. TICAD-related conferences have also taken place in, such as TICAD Asia-Africa Trade and Investment Conference (TICAD-AATIC), (Tokyo, Japan) 2004. Many regional conferences have been held which help develop the notion of African ownership of the continent's development: TICAD Conference on Consolidation of Peace (Addis Ababa, Ethiopia) 2006, TICAD Fourth Asia-African Business Forum, (Dar es Salaam, Tanzania) 2007, TICAD Ministerial Conference on Energy and Environment for Sustainable Development (Nairobi, Kenya) 2007.

2. Rural Production, Rural Consumption (RPRC)

Rural production, rural consumption (RPRC) is the Japanese Ministry of Agriculture, Forestry and Fisheries response to the critical situation in rural areas and the problems in the food system. The RPRC movement helps support nascent activities of rural communities to help themselves. Farmers sell their products and value-added processed items through farmers' markets in towns, or through direct marketing schemes to schools, factories, offices and restaurants in rural areas. The philosophy behind the scheme is that local products are consumed in local areas. The size of the local markets is enlarged through the interaction of producers and consumers, and the establishment of direct sales outlets for agricultural products, such as to schools or local restaurants. The gap between producers (farmers) and consumers is broken down. The RPRC movement scheme is illustrated in Figure 10.

A good example of successful RPRC activities can be found in Sera Highland where network collaboration involves 53 local agricultural groups including 7 orchards, 6 flower farms, 12 agro-processing groups, 3 rural restaurants, 11 farmers' markets, a high school and a farmers' association. The network organizes events such as a market road that highlights local specialties, exhibitions for special products, fruit Olympics and various seminars, all of which leads to a growing tourist industry in the area. Eco-farming and slow food movements are also being piloted.

Many groups have formed Agricultural Co-operative Societies, which start farmers' markets and other activities, often with the co-operation of the local community. In 2007, for example, the School Lunch Programme in Tochigi Prefecture was transformed through the use of local, fresh produce. School lunches have been provided in every public primary and junior school in Japan for the last 50 years and in Tochigi Prefecture, with the co-operation of the City Education Committee, the local Agricultural Association and local green grocers and farmers, the principles of RCRP were instilled in the School lunch programme, aiming to increase the intake of fresh vegetables and regularize the eating habits of the local children.

The Ministry of Agriculture, Forestry and Fisheries has commended a number of groups involved in the RPRC movement since 2004. Each year 7 to 10 groups are commended by the Ministry for their contributions to the development of the food industry. Some of those commended in 2005 to 2008 are listed in Table 3, demonstrating various

areas of operation. The RPRC movement has spread over the country as can be seen in the locator map (Figure 11) for some of the commended groups.

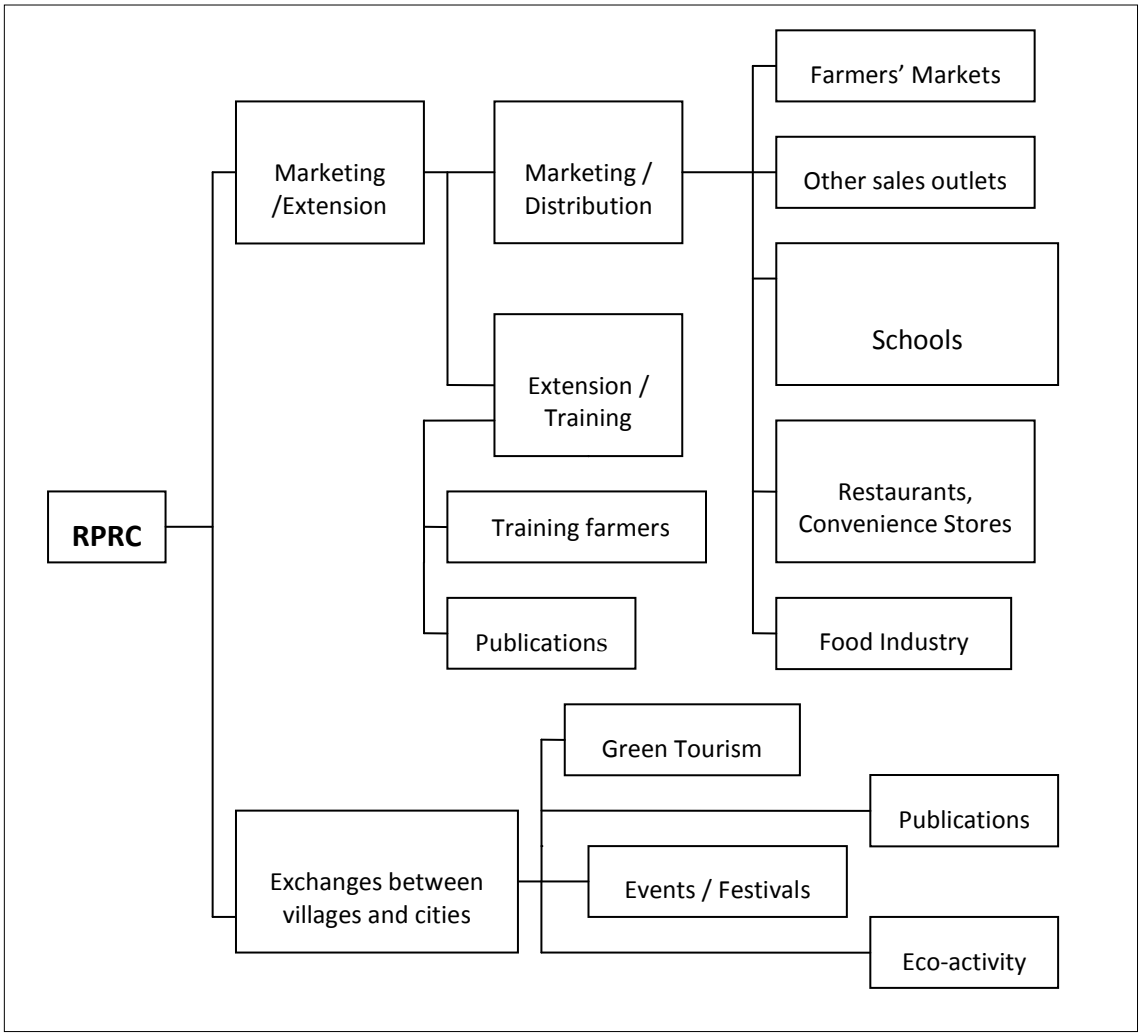

Figure 10 - The Rural Production Rural Consumption Scheme (RPRC)

Table 3 – Typical RPRC Groups commended by the Ministry of Agriculture, Forestry and Fisheries, Japan in 2005 to 2007.

Year	Name of RPRC Group	Activities
2005		
1	Yabuta Farm	Eco-farming and marketing by new farmers
2	JA Akita Yamamoto	Rural movements with farmers, consumers and school students. Collaboration with sightseeing
3	Shunsai Farmers' Market (Shunsaicom.net)	Effective utilization of farmers markets and existing wholesale markets
4	Farmers' Market, Itoman	Cultivation of traditional vegetables and holding many events
2006		
5	Okuizumi Networked Farmers' Market	In networked system by JA and 14 farmers markets, the rural products and their processed foods are marketed with high profit
6	Ohmura Dream Farm Inc., Chou chou	Promotion of agri-business to enhance rural agriculture through the 6th Industry. Their functions: production, processing and marketing.
7	Souka High School, Mie-ken Prefecture, Faculty of Food Cooking	High School students managed a restaurant in cooperation with local people
8	Izumi no Sato Company	Women farmers serve food materials to school lunch, hand down traditional food culture and exchange information to town people
9	Michi no Eki Towada Group	With ideology of rural production and rural consumption, 23 farmers' markets are networked
2007		
10	Agriculture Cooperative Society, Horigane Products Center, Nagano Prefecture, Azumino	Farmers' Market Agro-processing and Village Restaurant. Increase in employment of women and old villagers
11	Agriculture Cooperative Society Kanan, Osaka-fu, Kanan	Road Station Farmer's Market revitalized the cultivation and sales of traditional vegetables, and increased the income of the farmers. The station also served as venue for cultural exchanges.
12	School Lunch Program, Tochigi Prefecture, Tsuga	Transformed through use of local fresh produce. In cooperation with the City Education Committee, the Local Agricultural Association and local green grocers and farmers, the School Lunch Program aims at increased intake of fresh vegetables and regularizes the eating habits of primary and junior school students.
13	Agriculture Cooperative Society, Isawa Farmers' Center (AJISAI); Iwate Prefecture, Isawa	Farmers' Market, Processing, Restaurants in rural areas.
14	KUOTSU Fisherman Association, Kouchi Prefecture, Kubotsu	Market, Restaurant using fresh fishes

Table 3(a) – Typical RPRC Groups commended by the Ministry of Agriculture, Forestry and Fisheries, Japan in 2008

Year	Name of RPRC Group	Activities
2008		
15	Co. Genki no Sato (Village of vitality)	An agro-business with farmers' market, food-processing factory and farmers' restaurant. Creating the chances for small-scale or high-aged farmers to get income and also farmers having high profit.
16	Co. Ariake Shisui	An agro-business with 7 fields of producing, processing, transportation, marketing, sight-seeing, services and cooperation. Their activity places emphasis on eco-farming. Most farmers and dealers have license as eco-farmer.
17	Miko no Sato	A cooperative body in de-populated and mountainous area. Value-addition and marketing of local products in farmers' market or to city consumers with advertisement. Accepting and promotion of young generation in old or empty farmers' houses and farms. Owner system to cultivate local products, especially in terraced paddy fields, built on hill sides.
18	Souma Qualified Chefs' Association	695 members of licensed chefs in Souma area who are working in restaurants, schools, hospitals and shops, have promoted to use of local agricultural products and tried to traditional yet new menu specialized the area

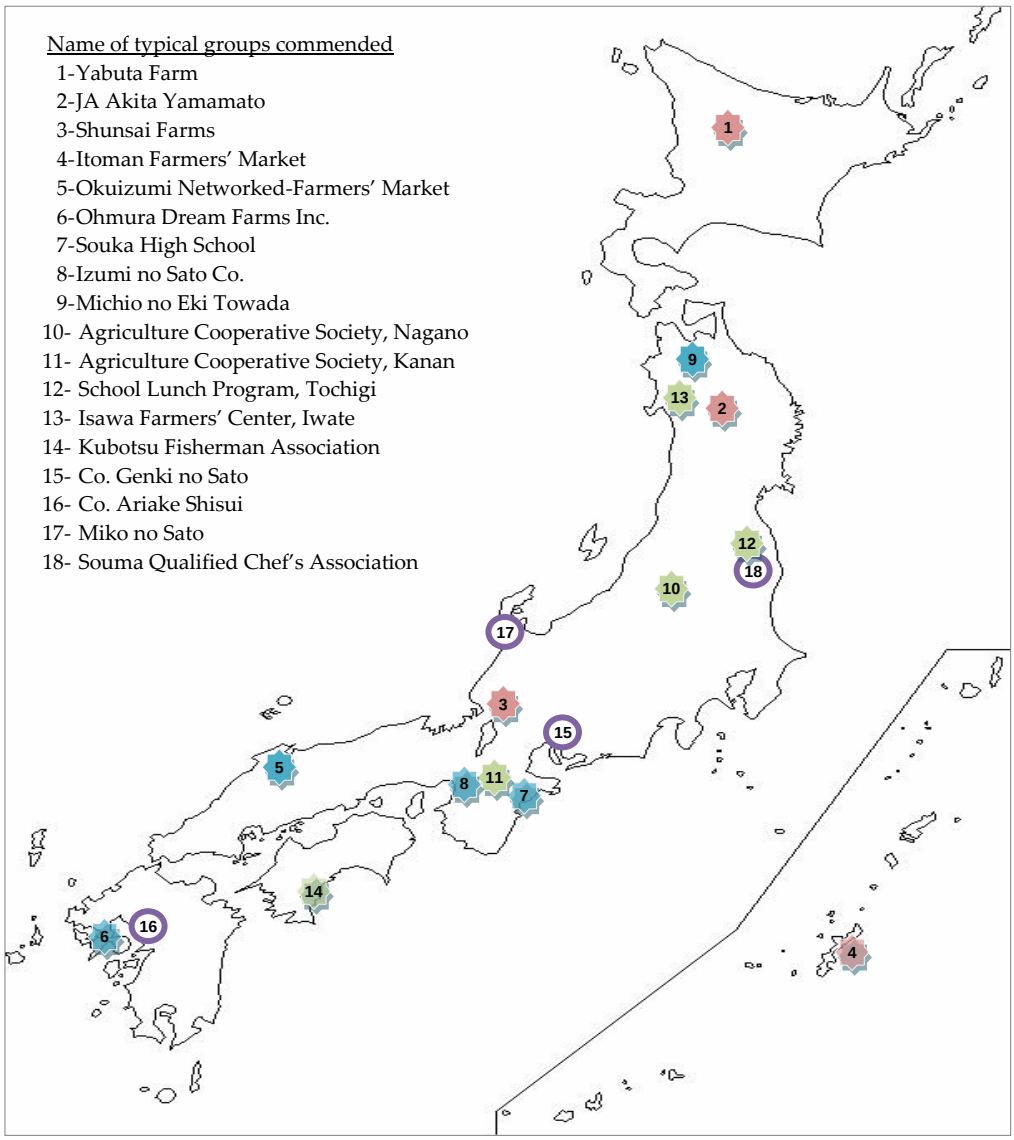

Figure 11 - Locations of typical RPRC groups commended by the government of Japan in 2005 to 2008.

VI. Regional (or Community) Food Systems

OVOP and RPRC are both regional food systems aimed at improving rural areas through the development of market channels and processing facilities that create stronger links between farmers and consumers. OVOP was initiated earlier in Oita Prefecture and spread to other prefectures in Japan and other countries in the world Recently the Ministry of Foreign Affairs and the Ministry of Economy, Trade and

Industry cited its role in international co-operation and trade. RPRC on the other hand is limited to Japanese rural districts and stems directly from fears concerning rural de-population and inadequacies in the Japanese national diet. Both movements are made up of farmers' groups, Agricultural Co-operatives, women's groups, and local community organizations such as schools, restaurants, and other local businesses. Their goals are similar: to increase rural incomes, food security and sustainability. And their methods are similar, too: creating networks for food education and training, eco-farming, developing Green Tourism, and maintaining local traditions, local agricultural crops and products.

Food security increases as relationships are created and developed between stakeholders in the system, namely, farmers, processors, retailers, restaurants, schools, consumers etc. For example, not only do farmers' markets provide consumers with fresh, local produce but they also create regular face-to-face interaction between producers and consumers and small-scale food processors and retailers.

OVOP and RPRC offer alternatives to export as a means of increasing the size of markets. This is where Value Chain Analysis comes in. Value chain is a concept from business management that was first popularized by Michael Porter in 1985. At each point in the food chain, food products gain value. For instance, in Ethiopia, coffee beans represent 80 per cent of total exports. The present domestic coffee marketing chain from farm to export includes small-holder coffee farmers or state farmers, primary collectors, suppliers, processors, service co-operatives, unions, exporters and various government institutions. Each of these points in the chain potentially adds value. It has been estimated that the final commodity is sold at prices 100 times greater than the growers' selling price. The potential exists for further adding value through marketing. Since 2001, it has been possible for Ethiopian growers to by-pass traditional coffee auction houses. Farmers could increase their returns by improving quality control all along the value chain, by such things as creating recognizable brands, improving labelling, improving the distribution (shipping).

VII. Role of *Sixth* Industry in Rural Enhancement

The concept of the sixth industry was proposed by Naoomi Imamura, a Professor Emeritus of Tokyo University. Three industries make up agriculture: production, processing and marketing. Imamura felt that the expectation that producers would conduct all three was unreasonable and proposed instead the sixth industry, or the essential condition for the

Production (1) + Processing (2) + Marketing (3) = 6. The essential condition for the sound operation of the sixth industry is the mathematical formula that states: *if one industry is zero, the 6th industry shall be zero too*:

(1)	**+**	**(2)**	**+**	**(3)**	**=**	**6**
(1)	**x**	**(0)**	**x**	**(3)**	**=**	**0;** if processing is missing

The importance of the sixth industry for regional development or community food systems is recognized by many leaders of agro-business.

VIII. Successful Cases: Food Systems in Rural Development

- ***Case 1: OVOP Movement, Oyama-machi Agricultural Cooperative, Oita Prefecture, Japan***

  Oyama-machi is a village in Oita Prefecture in Kyushu where the OVOP movement was started (Figure 12). A small village surrounded by mountains, where the arable lands were less than half the average of Japanese farmers and livelihoods depended on the cultivation of small amounts of rice and sweet potatoes.

  The chairman of the Agricultural Co-operative, Harumi Yahata, had the idea that plum or chestnut trees would be a better crop in this hilly terrain. The plum or chestnut trees were a way of turning what seemed an insurmountable difficulty to advantage. But the plum fruits harvested for the first three years were of poor quality, with thin flesh and fruit, and did not sell. They did not give up, however, and by selecting adequate lands and devising cultivating means, they gradually improved the quality of their harvest. Marketing campaigns that focused on the nutritional value of plums helped increase sales volume. Sales of *Umeboshi* , a traditional plum pickle became popular at farmers' markets.

  Fumihiko Mori began cultivating plum trees when he was 17 years old and has now built up a successful family business involving the production, processing and marketing of plums. Mori and families like his realized that while they could earn a living selling the fruit, their income could increase four-fold by processing these same fruit into plum pickle. His wife, Kamoko, makes plum pickle and his daughter,

Ayumi carries on the family business, helping out with bringing the produce to market.

In the market at Konohana Garten, 170 kinds of plum pickle are on sale, alongside other processed food items such as hand-made breads, traditional cooked waxy rice, pickled Chinese cabbage. A vegetable farmer can sell a fresh gourd for 100 Yen, turn it into pickle and sell that for 210 Yen, or special pickle soaked in rice bran for 400 to 500 Yen. New products are developed, for instance an artificially cultivated mushroom (*Flammulina velutipes*) has come on to the market. Villagers have equipped and opened a rural internet and multimedia system for the use of all residents. At a restaurant near the market, the home-cooked cuisine featuring local produce attracts hundreds of visitors.

The philosophy of the Oyama-machi Agriculture Co-operative is that all contribute to an agricultural community that responds to local needs, takes account of the environment and creates a harmonious and affluent society that members can be proud to bequeath to successive generations. The lived philosophy is spread through cultural exchanges to other villages and cities in Japan and beyond.

The popularity of the local farmers' market, Konohana *Garten*, became renowned in the area and attracted visitors from neighbouring cities.

The mountainous Oyama-machi, Oita Prefecture, Japan

Agriculture in Oyama-machi before OVOP movement

Umeboshi, the traditional plum processed into pickles and sold in the Farmers' Market

Figure 12 - Oyoma-machi, origin of the OVOP Movement. The Oyama-machi Agriculture Cooperative capitalized on processing and marketing *Umeboshi* which became popular in the Konohana *Garten* farmers' markets.

- ***Case 2 – The 6th Industry: Chou-Chou Company Ltd., Ohmura City, Nagasaki Prefecture, Japan***

  The Chou-Chou Company Ltd. is located in Ohmura city, in the north of the Nagasaki Prefecture, south-west of Kyushu (Figure 13). The port city of Nagasaki, the capital of the region, slopes gently towards Ohmura Bay. The land is good for farming, and the location, well-served by roads and an airport, make the region a popular tourist spot.

  In 1993, eight farmers got together to start a farmers' market. By 1997, they expanded into agricultural processing and established the Ohmura Dream Farm Inc. 'Chou-Chou' in 2000. They expanded yet further into making ice-cream and cakes using their local produce and were so successful that their agribusiness is now supported by a governmental foundation.

  The Chou- Chou Company is a perfect example of the enhancement of rural agriculture through the so-called 6th Industry – production, processing and marketing. Their main projects are:

  1) Farmers' Market: About 100 farmers and food workers in the area are under contract to the market. Their produce and products are regulated for quality-control using a yellow/red card system.
  2) Restaurant: A successful restaurant where the menu uses almost entirely local products. The grape vine rooftop makes it a popular venue for wedding receptions. The restaurant with its grape vine ceiling, and some sample dishes.
  3) Food education and training: Chou-Chou also runs courses for school children as well as for adults and for the retired, in an effort to revive the rural economy. Training is offered in a diverse range of skills, from harvesting strawberries or pears, to making sausages, cakes or bread, to flower arranging.

Location of the Chou-Chou Co. Ltd. in Nagasaki-ken, Japan

The Chou-Chou Farmers' Market and an assortment of products sold in the market.

Food education and training for school children, adults and retired - Training of all sorts for all ages keeps rural skills alive

Figure 13 – Enhancement of rural agriculture through the 6th industry: production, processing and marketing - The Chou-Chou Co. Ltd. in Nagasaki, Japan

- ***Case 3 – The Road Station Farmers' Market, Kanan-town***

  Kanan, located south of Osaka, at the foot of the *Kongo* and *Katsurage* mountains is a good example of a middle-scale project where marketing accelerates regional agricultural production and processing. Like many other regions, Kanan experienced a decline in agricultural production, with the ageing of the farming population and no successors to replace them. A farmers' market was opened but its irregular opening times made it an unreliable source of trade.

  In 2001 a Road Station opened in Kanan. Road Stations are controlled by the Road Bureau, Ministry of Land, Infrastructure and Transport and, since 1991, numbers have grown to about 870 stations all over Japan. Alongside the growth of the national road network came the need for comfortable and safe rest stops. Road stations can revitalize the regions in which they are sited and also serve as a hub for regional co-operation. Some road stations feature significant regional facilities such as markets, event halls, first-aid stations, short-stay hotels and even hot springs. At Kanan Road Station, a busy farmers' market (Figure 14) was set up, where now more than 90 per cent of the products sold are produced in the region.

  Consumers trust in the safety of the local produce and the food products made in the road station kitchen – such as bread made from rice powder, fermented soybean paste, fruit jams and so on. The market has spawned a revival in the cultivation of traditional vegetables of the region such as *Naniwa* (old name of Osaka). Cultural exchanges and events to promote educational efforts such as a school lunch service are organized in collaboration with the local city government. The market at Kanan has helped revitalize agriculture and increased farmers' income.

Traditional *Naniwa* vegetables now sell in the market

Figure 14 - The Road Station Farmers' Market in Kanan Town has spawned a revival in the cultivation and sale of traditional vegetables of the region.

- ***Case 4: Contract Farming and Service Provision: The Angkor Kasekam Roongroeng Rice Mill Company in Cambodia***

  Rice is a staple food in Cambodia and rice production plays a fundamental role in the ceremonial and religious life of the Cambodian people. Ninety per cent of total cultivated land is allocated to rice production and 13 per cent of GDP is contributed by rice. Rice processing and trade are also important rural activities.

  Despite this, the quality of rice produced in Cambodia is not always high. Post-harvest loss is great due to poor handling. Paddy (rough rice) treated by farmers is milled into milled rice and bran. Milling recovery and the quality of milled rice is also generally very low. A survey by IRRI (International Rice Research Institute) in 1999 found milling recovery of only 60 per cent, and head rice recovery of 50 per cent. The low recovery rates are caused mainly by the absence of quality markets and poorly performing mills. Mills in Cambodia are classified as manual milling, custom mills, or commercial rice mills. A recent report estimated numbers as follows:

Table 4 - Rice Mills in Cambodia

Type of Mill	**Number of Mills**	**Milling capacity (kg/h)**	**Estimated aggregated total capacity***	**Constraints**
Manual milling	Unknown			
Custom Rice Mills: - Micro-mill (Engleberg) - Village rice mill	 29,594	 50-200 120-300	 4,000,000	Contract millers keep the bran, therefore, they are not interested in high milling recovery
Commercial Rice Mills - Commercial rice mills - Export-oriented commercial rice mills	 948 1**	 500-2,500 240 t/day	 1,500,000	The absence of a quality market results in low quality consciousness among mills where a higher amount of broken grains increase the revenue of the millers

*The estimated aggregated total milling capacity uses a utilization of 300 days a year which is not realistic because of the seasonal patterns of rice production and limited storage capacity of the mills

Paddy moves from farmers to consumers through mills or paddy collectors and wholesalers or retailers. There is no formal inspection and little quality control. The price of paddy or milled rice is mainly based on variety and season, for example, wet season rice fetches a higher price. The timing of sales is an important determinant of price due to

seasonal price fluctuations. According to a working paper, farmers who sell rice just after harvesting will make less than those who are able to hold back the rice stocks to sell later.

The *Angkor Kasekam Roongroeng* Rice Mill Company, located in Kandal (north-west of Phnom Phen) operates in just such a market. It has a total capacity of 240 tons per day. The mill exports high-quality aromatic rice under the brand name Angkor Rice, targeted mainly at Asians living abroad in countries such as Canada, Australia, the United States and European countries.

The Cambodian farmers have contractual arrangements with *Angkor Kasekam Roongroeng* Rice Mill which encourages diversification of agriculture (Figure 14). Under the scheme, the Mill provides quality seeds of varieties in high demand, cultivation techniques and know-how, and non-chemical fertilizers. They provide training and advice on multiple farming and livestock feeding, as well as renting agricultural equipment at fair prices to the farmers. In return, the farmers return twice the amount of rice seeds after harvest and sell more paddy to the Mill. The Mill refines high-quality rice from collected paddy. The advantages to both sides are clear (Table 5).

Table 5 - Advantages for farmers and miller in contract farming schemes

Advantage for Farmer	Advantage for Miller
• High-quality seeds • Extension service for rice and other products / livestock • Access to agricultural equipment and other inputs • Guaranteed price not dependent on seasonal price fluctuation	• Highly priced homogeneous variety • Access to other products such as fruits and vegetables • Reduced risk • Controlled production volume

The farmers and farmers' associations that co-operate with the *Angkor Kasekam Roongroeung* Rice Mill Company are scattered in three provinces near Phnom Phen (Figure 15). In the southern areas, small-scale-farms are dominant so that living standards of farmers are somewhat lower than for farmers in northern areas such as *Battangbang* Province. The farming system is determined by seasonal changes in the Mekong water system. The water level of the Mekong increases in the wet season and flows backwards into the *Tonle Sap* Lake, causing flooding in the downstream river areas, and then gradually recedes in the dry season. The rice is best cultivated when the water levels rise, since the water brings fertile soils, as well as fish and other aquatic animals.

Cooperation between the farmers and the Mill helps to increase incomes without disturbing traditional eco-farming.

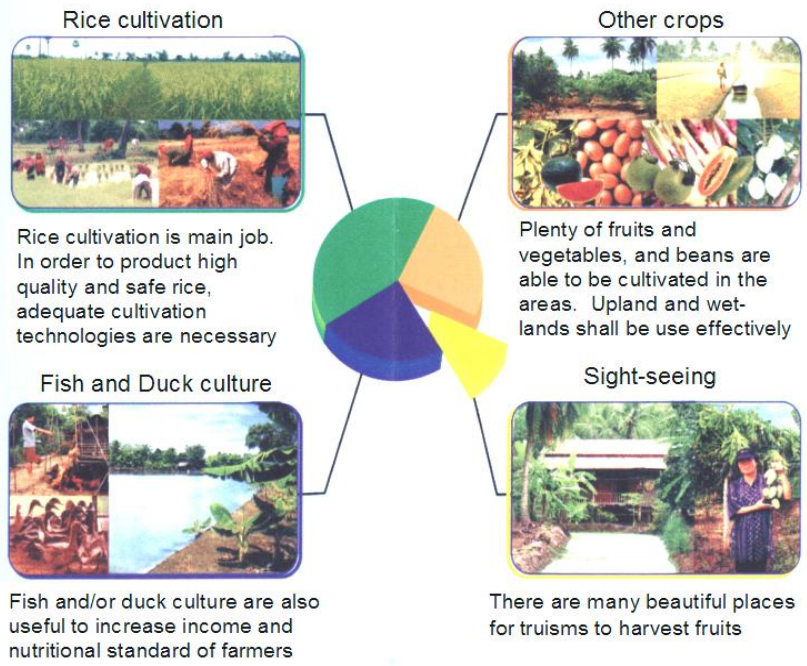

Figure 15 - Diversification of agriculture as advised by the *Angkor Kasekam Roongroeng* Rice Mill

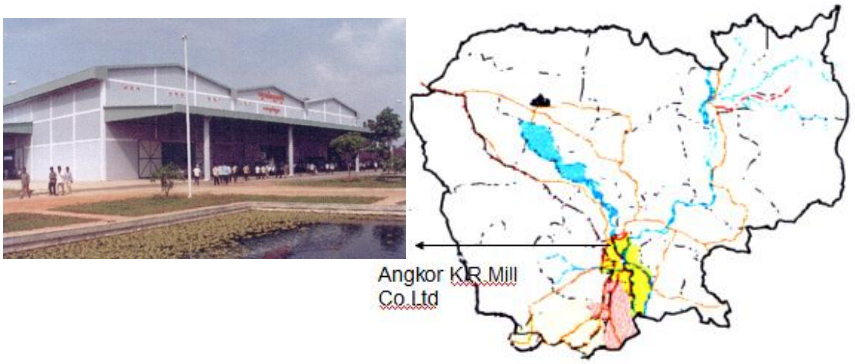

Figure 16 – Farmers from different regions collaborate with the *Angkor Kasekam Roongroeng* Rice Mill

Similar examples of this type of collaboration between the farmers who produce the raw materials and processors are found with crops such as barley (breweries), rice (rice cracker makers), sunflowers (sunflower oil millers), and so on. These relationships are important builders of community systems.

IX. Constraints for the development of adequate food system in Ethiopia

Ethiopian food shows strong influences of the ancient Mediterranean and Middle-East. Crops unique to Ethiopia, such as *teff, enset, nug*, were domesticated in ancient times, and are used to make Ethiopian staples such as *injera* (a type of bread), *kocho* (a bread made from *enset*), and *wat* (a thick sauce). Ethiopian cuisine is spicy, with the use of a wide variety of herbs and spices (often used also for their medicinal properties) and is characterized by Islamic customs such as the exclusion of pork and shellfish from the diet and fasting. Traditional foods are prepared for fasting days. *Berbere* (red pepper, or mixed condiment with red pepper) is frequently used and coffee is a regular daily drink.

- ***Interview of Home-Agents in Ethiopia***

  A survey into the Ethiopian diet, undertaken as part of a seminar in September 2007 at Melkassa Agricultural Center of the Ethiopian Agricultural Research Institute, drew some conclusions about the constraints to the development of the Ethiopian food system. Ninety per cent of those who attended the seminar completed a questionnaire that asked:

  - What systems, services or regulation are lacking in Ethiopia?
  - What difficulties do farmers face in selling their products?
  - What difficulties do food-processors face in selling the products?

  1. *Respondents' Background Information*

     · **Gender:** men – 14, women - 17

     · **Ages:** 20s - 4, 30s - 7, 40s - 8, 50s - 5, 60+ - 1, not stated – 6

     · **Religion**: Christian - 28, Islam – 1. not stated – 1

     · **Fasting habit**: fasts - 25, no fasting – 4, not stated – 2

     · **Home grounds** are approximately shown in Figure 17.

     The names of administrative states and two characteristic cities are shown. The respondents originates from; South Nations, Nationalities, People's Region (SNNPR), 8; Oromia, 6; Addis Ababa, 5; Harari, 4; and Amhara, 3; and numbers of not-filling, 5.

     The ratio of religion and fasting habit show that the respondents were not characteristic of Ethiopian society as a whole; they have a higher than average living standard; and higher level of education.

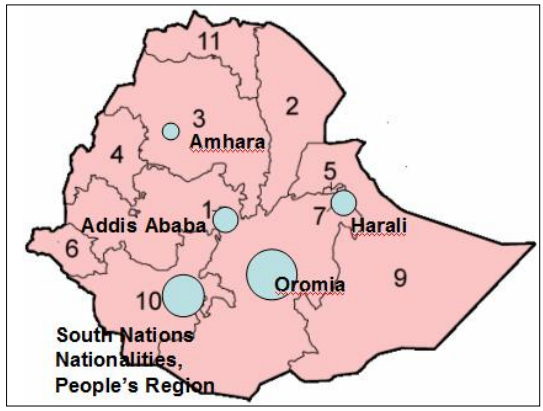

Figure 17 – Home ground of respondents

- ***Opinions of respondents on constraints in the development of food system in Ethiopia***

  The responses of the respondents to the questions are tabulated below. The responses could be classified into three categories: Shortage of Food, Farmer's Difficulty and Food Processors' Difficulty.

  Opinions about what services are lacking in Ethiopia are difficult to draw conclusions from and it should be noted that all respondents are government workers, so perhaps not representative of the general population. Shortages of water and energy sources and poor food resource are cited, as is the underdevelopment of information networks and technologies, and lack of food safety. Inflation is a problem. In terms of difficulties selling their produce, the most common responses were poor road networks, or other means of transportation; and lack of stable markets. Food processors also cited poor road and transportation networks, high prices, irregular supplies, as well as a dearth of consumers with a high enough standard of living to create stable demand A lack of knowledge of food processing techniques, preservation, and quality control also featured. There was a difference of emphasis from case to case, place to place and this needs further investigation.

Table 6 - Opinions of respondents on constraints for adequate development of food system in Ethiopia

A- Shortage of food	B- Farmers' Difficulty	C- Food Processors' Difficulty
· Shortage of food, quantity required not available; Not enough product for future consumption	· Losses during harvest and postharvest handling	· Dietary/Food habits; Strong cultural values, not easy to adopt new food*
· Lack of training on home science and food technology, and food preparation; University should train more	· Losses due to deterioration	· Process improvement; Needs Knowledge/ Awareness on food processing and value-addition – both processors and consumers
· Lack of food safety regulation; No control; Not hygienic; Poor health	· No food processors (and facilities)	· Processing, storage and distribution system not properly organized
· Centralized market distribution	· Products not impressive (poor packaging); Products could not compete in the market	· High cost of raw materials; Not stable supply; · Limited market Outlets (market shortage)
· Poor transportation and communication systems	· Could not process their crops for market	· Poor market access especially in remote areas; Poor road and transportation network
· Lack of awareness (Insensitivity for farmers)	· Lack of access to market information	· Preservation of fresh products
· Extensive but ineffective support system	· Unstable market	· Interference of middlemen
· Poor economy		· Poor sales; Low demand; Few customers; Low profit
· Poor return on farming		· Shortage of capital
· Lacks potable water		· Lack of modern technologies
· Unreliable supply of electricity		· Poor quality of products; Quality control needed for both imported and locally produced materials and products
		· Food safety not known

*Ethiopian consumers respect traditional foods and not select multiple items

X. The future development of food system in Ethiopia

The development of the food system in Ethiopia, as in many African countries, depends on stable markets for farmers, modern transportation and communication networks, and attention to quality control. The development of large-scale markets will be impeded by the general poverty of consumers. Historically, however, trade has prospered and

flourished from the Middle East to Africa and there remain very big markets in big towns and open markets in small towns, even today.

Learning from experiences in Asia and other developing countries as presented in the earlier cases, the following lessons could be drawn and could be applied to facilitate the development of regional food system in Ethiopia, in particular, and other countries of Africa, in general:

1. Co-operatives and agricultural associations enable farmers to sell their own products themselves;
2. Farmers' markets allow for small-scale direct selling;
3. Adding value by agro-processing at home can increase income;
4. Stable markets can be aided by diversification, specialization, and selling a year of commodities at a time;
5. Advertising and marketing via handbills, posters, cell-phones and newsletters can be effective;
6. Regional co-operation can ease transportation problems;
7. Quality products can be enhanced with good and creative packaging, whether modern or traditional;
8. Choose a good location for your farmers' market, where high traffic can be guaranteed;
9. Co-operate with local food industries or restaurants/hotels to sell your products;
10. Think ahead to agro-business enterprise involving markets, restaurants, food factory and green tourism farms;
11. The next stage could be exports: quality brands, quality packaging;
12. Government or related organizations and institutes shall support such agriculture-led industry in villages or local communities, politically and financially. The program of training leaders is most important.

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Book 2
Value Chain Analysis for the Development of Innovative Agro-based Industry in Africa

by:

Toshiro Mado

I. Food Demand and Value-added Agriculture in sub-Saharan Africa

Small-scale agro-processing activities are very common in sub-Saharan Africa (SSA) and are an important means of income generation in rural communities. Agro-processing methods vary from country to country, and from crop to crop, and can differ also depending on the target market and demand. In recent years, food production in SSA has gradually increased, thanks both to increased farming areas and to the application of modern technology. The increased growth in food production has kept pace with increases in population (food production per capita) in the region, Figure 1.

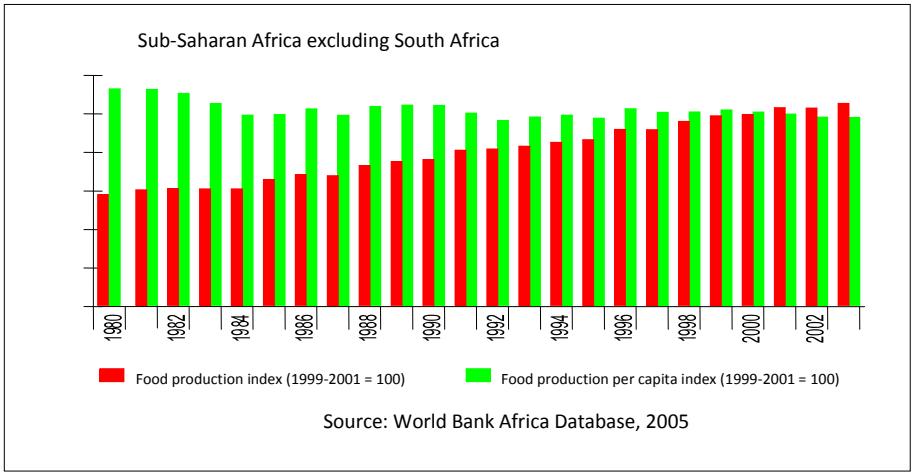

Figure 1 - Food production index in sub-Saharan Africa (1980-2002)

The sub-Saharan region has a diverse climate, with vast fluctuations in rainfall patterns creating fluctuating patterns of agricultural production within the region. Whereas some areas will suffer severe food shortages, other areas even in the same country might produce surplus crops. For example, in 2001 the drought in the north-east of Ethiopia caused food shortages; at the same time as huge surpluses in maize in western Ethiopia caused a sharp fall in the price of that crop. Farmers in the

region have learned that processing and preserving their crops can add value (Figures 2 and 3) contribute to food security and thereby help stabilize their incomes and livelihoods.

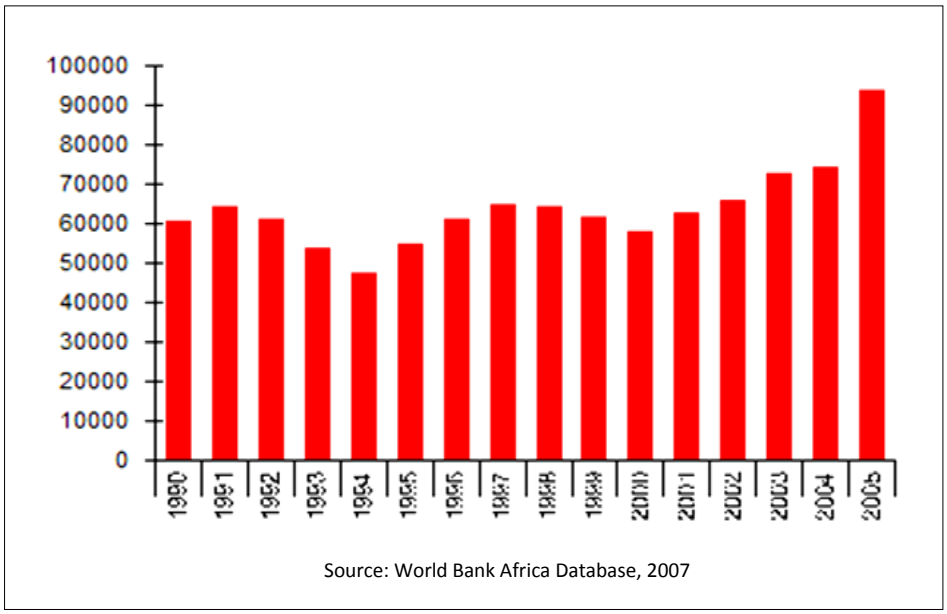

Figure 2 - Value-added agriculture in sub-Saharan Africa (Million US$)

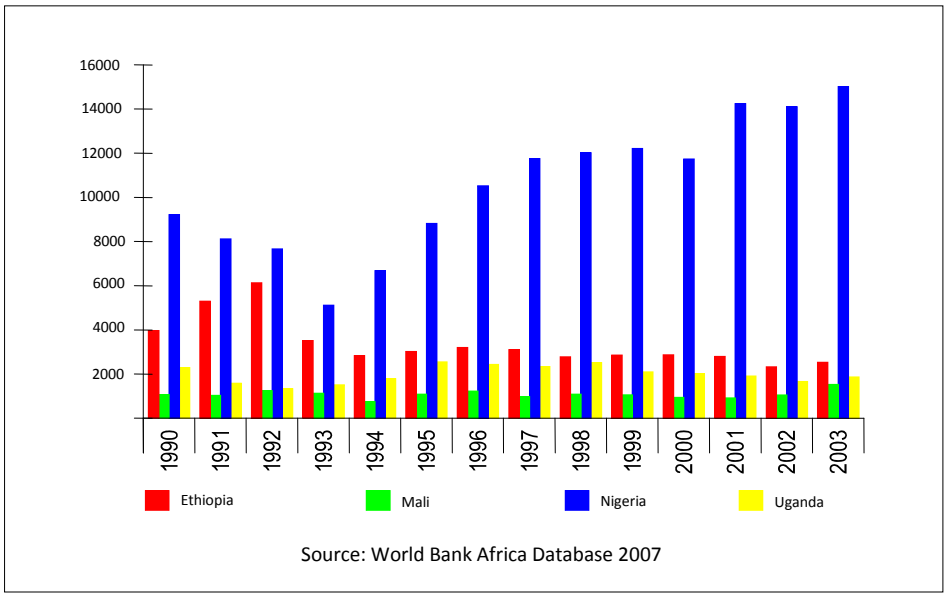

Figure 3 - Value-added agriculture in Ethiopia, Mali, Nigeria and Uganda

The sub-Saharan region has faced rapid population increases both in urban and rural areas (Table 1). The increase in the urban population in sub-Saharan Africa (SSA) is constantly at a rise, and specifically for Ethiopia, Mali, Nigeria and Uganda, the increasing trend in the urban population (Figure 4) puts a high pressure to the producing population in the rural areas. The resulting increased demand for quality agricultural products to supply the food industry and urban consumers has created an opening for the development of small-scale agri-business and primary production, which has in turn stimulated the growth of the agro-processing sector.

Table 1 - Urban population as per cent (%) of total population (North & sub-Saharan Africa)

Region	1980	1985	1990	1995	2000	2003
North Africa	44.65	46.91	48.78	50.38	51.82	52.81
Sub Saharan Africa	23.06	25.30	27.86	31.04	34.24	36.17

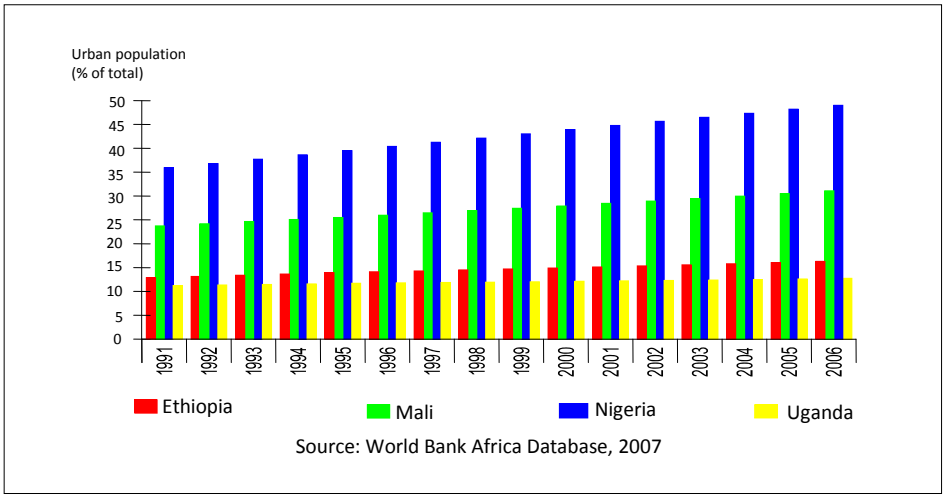

Figure 4 - Urban population in Ethiopia, Mali, Nigeria and Uganda

The food industry and agricultural sectors are strongly interrelated in most SSA countries, and can be a strong driving force towards the expansion in economic scale and activity of rural communities in the region. Agriculture and industry contributes, on the average from 1980 to 2002), more than 50% in the GDP (Figure 5) in sub-Saharan Africa. Agriculture alone contributes a significant share in the GDP of Ethiopia, Mali, Nigeria and Ethiopia (Figure 6). The agro-processing sector links

agriculture to industry by using available resources to add value to economic activities.

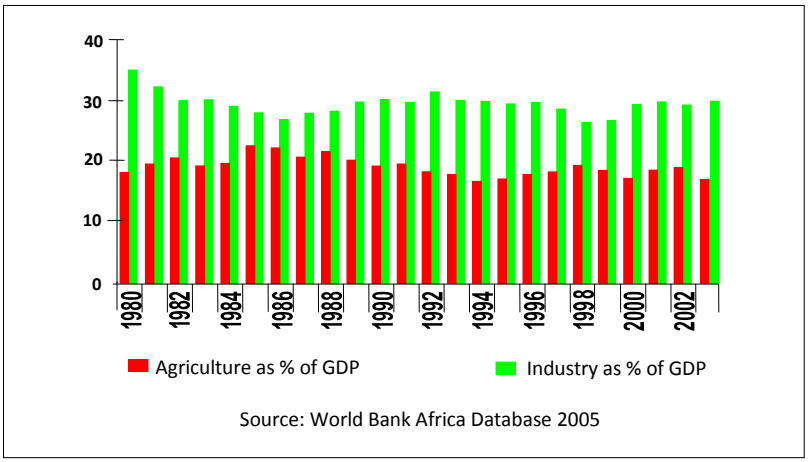

Figure 5 - Agriculture and industry as share of GDP (%) in sub-Saharan Africa

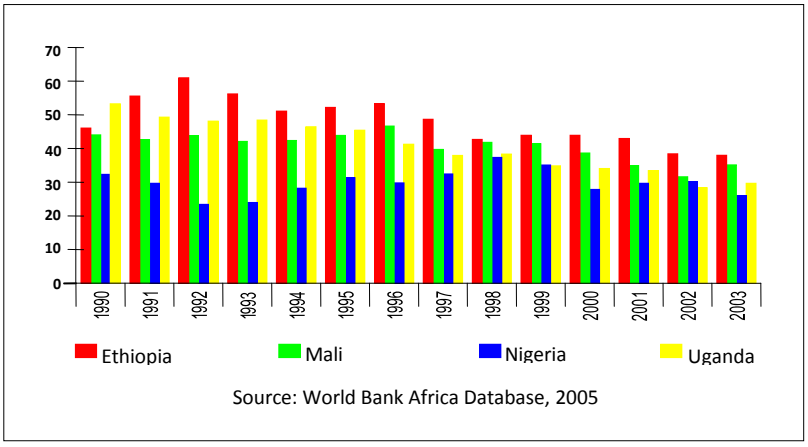

Figure 6 - Agriculture as share of GDP(%) in Ethiopia, Mali, Nigeria and Uganda

II. Market Access for Rural Farmers

A major obstacle to the development of agricultural support has been the difficulty of 'linking farmers to markets'. SSA farmers face many challenges in getting their products to consumers.

Figure 7 shows that the further down the market channel agricultural products go, the less control over quality and price have the producers. Conversely, the closer to the consumer the product gets, the more quality control is needed. The challenge for producers (farmers) is how to apply quality control down the end of the long, complex channel from rural farms to major city markets. A lack of infrastructure such as roads makes it even more difficult. In order for rural farmers to have better access to markets, different market co-ordinating mechanisms and arrangements need to be established.

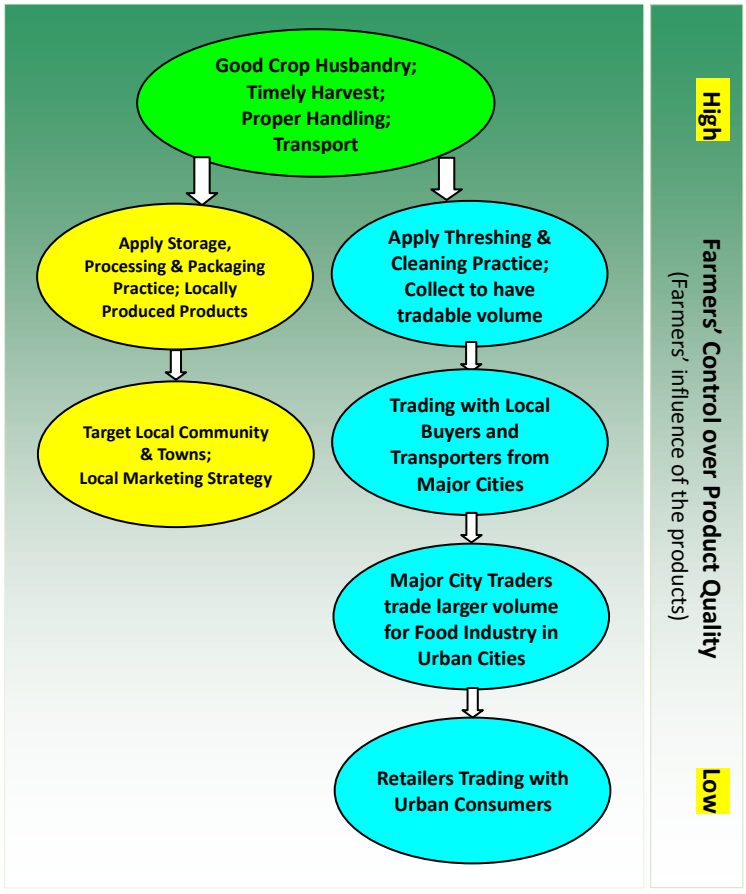

Figure 7 –The Agricultural Market Channel

According to Diao et al. (2003), Africa's domestic agricultural markets are worth US$50 billion per annum. Since the 1980s, a market-oriented approach for economic development policy became the norm in many developing countries including SSA. This has transformed rural agrarian communities, diverting them towards commercial oriented agriculture

and contributing to the structural transformation of rural economies through the market economy. The Economic Commission on Africa (ECA), the economic policy advisory body for the African Union (AU) concluded that sustainable food security and poverty reduction must be based on an agricultural and rural transformation because of the special distribution of population and poverty, and the structure of the economies of the majority of African countries. Agricultural transformation is the process by which individual farms shift from highly diversified, subsistence-oriented production towards more specialized production oriented towards the market (ECA, 2007). Agricultural transformation coincided with rapid population growth, especially in urban areas. Urban populations are in general growing about twice as fast as the overall total in developing countries, and by 2020 are expected to exceed the size of rural populations (Killick, T., 2001). As well as the obvious challenges presented by a rapidly expanding urban population can be opportunities, such as the creation of a large consumer market for local agricultural commodities. However, fragmented market channels that leave a gap between the rural producers and urban markets mean that high demand is met by importing a substantial number of processed agricultural products from outside the country.

Farmers have also faced difficulties penetrating new urban markets with produce perceived to be of poor quality, to show a lack of uniformity, and low volume and unstable supply. Market-oriented initiatives must take account of the inability of small-scale farmers to benefit from emerging markets in many cases.

Collective marketing is one means of linking small-scale farmers to markets. However, most successful collective marketing schemes are related to high-value crops rather than staple food crops (Coulter, J. 2006). The commercial potential of value-added ventures and innovations is not obvious, often is not realized, and may be frequently overestimated (Gray, A. et al., 2004). Numerous barriers, therefore, prevent the poor from more actively participating in markets, both as consumers and as producers (Mendoza and Thelen, 2008). To successfully apply a market-oriented development policy, markets must be made more inclusive for the poor. It is important to identify the constraints to market access faced by small-scale farmers, as well as to enable them to manage market resources. In this way, farmers can use the market to generate sustainable social capital.

III. Participatory Value Chain Analysis as Market Management Tool

Agricultural markets in SSA are characterized by fragmentation, seasonal production, small volumes of production unit, diversification, and lack of infrastructure. These factors limit integration and co-ordination. Market integration can be either horizontal or vertical. Horizontal integration extends the same level of market geographically to increase volume. Vertical integration (Figure 8) provides links to other levels of markets in the supply chain. Both are, in fact, interrelated. The concept of vertical integration was not applied to agricultural development in SSA until recently, possibly because it goes beyond traditional ideas of agricultural development, and can even extend to agro-industrial development.

With the liberalization of markets during the 1990s, followed by the opening of international markets and globalization, the concept of the value chain was introduced to explain the potential of the global market. According to Kaplinsky (2001), the value chain is the full range of activities required to bring a product or service from conception, through the different phases of production, delivery to final consumers, and final disposal after use. He proposed that value chain analysis could play a key role in understanding the need and scope for systematic competitiveness in the market. With the rapid penetration of the market into rural society, farmers need to be competitive in their agricultural marketing activities. The value chain approach is the preferred development strategy of several development organizations such as CIAT, GTZ, SNV, VSO, USAID and others. In many cases, however, the value chain approach has been global commodity oriented rather than domestic market oriented. Stamm (2004) cites empirical studies of the clothing industry and, more recently, of the international trade in fresh fruit and vegetables. The value chain approach has mainly been adopted for an export-oriented development strategy, which puts more focus on private export-oriented manufacturing companies. Most training in value chain analysis targets private company staff and industrial development policy officials. However, it can be modified for agricultural extension agents and rural farmers to help them understand the characteristics, function and linkages of local markets.

Facilitating and improving market knowledge was not a part of the conventional mandate of agricultural extension agents, however, it has become an important tool to help rural farmers to minimize losses and maximize benefits through markets. Participatory value chain analysis can improve understanding of the rural market system and can provide

agricultural extension agents with a useful tool to contribute further to rural farmers.

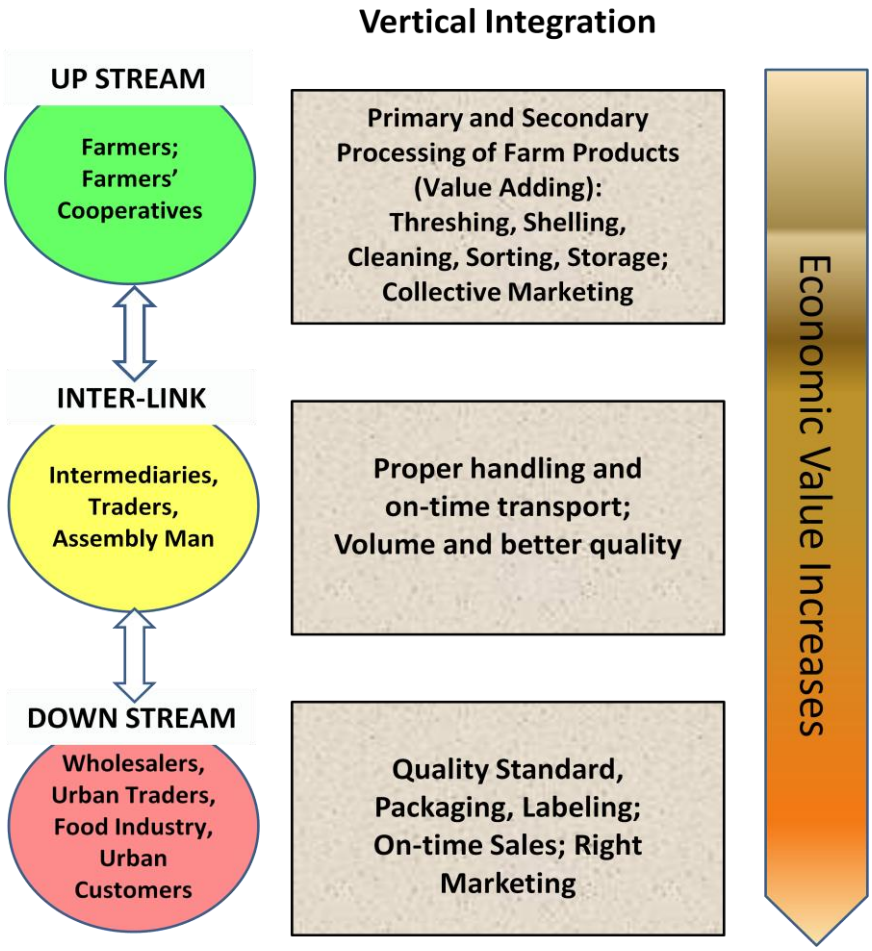

Figure 8 - Vertical integration of market forces within the value chain

IV. The Evolution of Agricultural Extension Services in sub-Saharan Africa

Agricultural extension has evolved in both concept and methodology since it began in the 60s. Agricultural Extension Reform has been debated particularly recently in light of the need to meet emerging demand. Until the 1980s, the function of agricultural extension was to disseminate the results of research and innovation to farmers (McDermott, J.K. 1987). This was known as the 'Linear Mode of Communication'. In this model, the

purpose of agricultural extension was to disseminate new technology to increase production. The 'Problem-Solving Model' introduced by Ban, A.W. Van den and Hawkins, H.S. (1985) held that the role of agricultural extension was to help farmers identify their problems and to find or to develop the information required to solve them. This model relied on a multilateral mode of communication between research, extension workers and farmers. Chambers, R (1989) introduced the 'Farmers-First Model'. He defined the agricultural extension worker as the outsider whose role was to empower farmers to learn, adapt and do better. According to Chambers, 'What is transferred by outsiders to farmers is not precepts but principles, not messages but methods, not packages of practices to be adopted but a basket of choices from which to select.' In this model innovation is not the research result, but the process made by farmers' knowledge and resource utilization. Participation became a main principle of intervention. However, Leeuwis (2000) argued that the participation approach could not handle any conflict that occurred within the process. He proposed negotiation processes to deal with conflict situations. The new role of the facilitator (or extension worker), according to Leeuwis, was to formulate sustainable agreements strategically. In this case, facilitators are not neutral, but they select the participants based on their strategy to resolve the conflicts. Recently the concept has been expanded: the Agricultural Innovation System focuses more broadly on the factors that stimulate innovative behaviour, and stresses linkages and partnerships with a wide range of actors along agricultural value chains (Anderson J.R., 2008).

The concept of agricultural extension has evolved and expanded to include new responsibilities, such as non-farm rural micro-enterprise development, marketing extension, farmers' associations and natural resource management. Despite the growth in responsibility, agricultural extension in sub-Saharan Africa is poorly funded. Most of the National Agricultural Extension Systems (NAES) in SSA were dismantled during the period of Structural Adjustment Programmes (SAP) in the 80s when they became a prime target of downsizing. Market liberalization has coincided with a sharp decline in state budgets and hence in public investment in key public goods, such as research, extension and infrastructure (Poulton, et al., 2004). Even with the hard work of individual agricultural extension agents, new demand could not be met by with the existing infrastructure and, as a result, agricultural extension was judged to be barely functioning. With the drive towards market-driven and pluralistic reforms, publicly funded agricultural extension systems were called into question when the reality on the ground in most

SSA countries was the result of chronic under-investment in research, extension and agricultural education. The geographic dispersal of rural farmers in most African countries makes reaching them with extension programmes or for trade expensive. Market-oriented economic policies put pressure on public extension services to become more efficient. However, it has proved more difficult to reach agreement on what needs to be done to improve the performance of agricultural markets. Barrett, C.B. (2008) pointed out that significant barriers to entry into commercial staple food grain markets existed that discouraged significant sales by smallholder producers. According to Christoplos (2008), small-scale producers, traders and processors have been largely unable to take advantage of available opportunities because they lack the capacity to meet market demands for quality, quantity and timeliness.

Inadequate access to information, understanding and networks are one form of capacity constraint. In many African countries, public agricultural extension services cannot cover newly emerging needs of rural farmers well and, in addition, private agricultural extension has not been well developed. There is a critical role for both public and private agricultural extension to help rural farmers to optimize their limited market resources. An additional role for agricultural extension is to gain better understanding of the characteristics of local markets in order to facilitate effective links for rural farmers with other market actors. Value chain analysis therefore can be a useful management tool for both agricultural extension agents and farmers to analyze the characteristics and value chain actors in local markets.

V. The SAA Agro-processing Technology Dissemination Programme

The Sasakawa Africa Association (SAA) introduced an agro-processing programme since 1994 to disseminate postharvest and agro-processing technologies, and to promote agro- and food- processing industries in SSA; however, its potential is yet to be achieved. The implementation of a sound resource allocation policy would help the region to fully realize the programme's potential impact.

The programme has recently applied value chain analysis, which follows six steps:

1. Identify and target crops from the point of view of food security and income generation.
2. Identify improved technology to connect value chain.

3. Identify the service providers of improved technology.
4. Identify the constraints of the service providers.
5. Identify possible intervention to minimize the constraints of service providers.
6. Identify intervention providers, and support their capacity building.

A matrix was developed that identifies possible areas of intervention to promote private sector development in the selected value chain. Table 2 shows a value chain for *Teff*, based on agro-processing activities from harvesting to milling (left column). It shows how to identify an area of intervention that can add value at each level of processing activity. A participatory approach that allows for completion of the matrix together with other stakeholders, sharing ideas and experiences, helps support institutional capacity development. A more effective role for development organizations can be to identify service providers – individuals, companies – and to build capacity at this level, as well as at producer level. Stakeholders will then have an opportunity to develop innovative approaches to meet newly identified demand.

In order to apply the value chain approach effectively, three things are needed:

1. Analyze and co-ordinate the value chain structure;
2. Capacity building of chain actors to aid integration; and
3. Improve value chain technology and methods.

The value chain approach can make an impact only when the value chain structure is well coordinated. The value chain can be coordinated from production through to consumption, or can be coordinated within some level or segment. The coordination of partial value chain and chain actors will eventually find a way to integrate up or down stream to improve productivity. The point of intervention should focus on enhancing access to markets. Improved technology can play a crucial role for farmers and other chain actors to find innovative way to connect to markets. Value chain analysis is a tool to utilize market resources.

The value chain analysis matrix (VCAM) can be used by both agricultural extension agents and farmers to understand the value chain. VCAM, illustrated in Table 3, is a simplified version of the value chain-based programme design matrix. VCAM is quick and easy to complete using farmers' own experience and knowledge as a source of information for the

value chain analysis. It is a reliable tool that combines farmers' knowledge and market information to better understand the potential of local markets.

Table 2 – Value chain-based project design matrix

Value Chain-based Project Design					Stakeholders' Meeting on Objective 2	
Value Chain of *Teff* → / ↓	Market Potential	Service Provider	Constraints	Possible Intervention	Institutional Development Project	Intervention Provider
Harvest	Mechanical harvesting service	Harvesting machine owners	Means of Transport	Improve the design of the cart	Basic design engineering/ manufacturing training for local manufacturers	AERI SG2000 University
On –farm Drying	Use of tarpaulin	Tarpaulin supplier	Access to potential customers	Field demonstration/ promotion	Training for suppliers on field demo	ARI SG2000
Threshing	Mechanical threshing service	Threshing machine owners	Maintenance; Spare parts supply	Training in maintenance; Link with S/P supplier	Basic design engineering/ manufacturing training for local manufacturers	AERI SG2000 Private Sector University
Transport	Improved cart sales	Fabricator	Manufacturer skill	Technical training	Manufacturing training	Private w/shop
Storage	Grain Silo	Grain silo Fabricator	Access to design and potential customers	Improve the design of silo; Field demonstration	Basic design engineering/ manufacturing training for local manufacturers	AERI SG2000
Milling	Mechanical Mills	Owners of mills	Maintenance	Improve design; Field demonstration	Technical	Private Sector

A farming calendar can be developed that can provide additional information on the allocation of labour, over crops, harvest times and marketing. The farming calendar enables farmers to visualize annual activities and suggest new targets. For example the Farming Calendar (Table 4) shows that farmers in Shashemene are engaged in the marketing of farm products for seven months in a year. Well-planned and diversified farming together with strategic marketing activities can reduce the seasonal risks of farming, and price fluctuations.

Table 3 -Value Chain Analysis Matrix (VCAM)

Chain characteristics analysis

Crop (Teff)	Farmers	Local Assembly	Local Market	Trader	Urban Market	Urban retailers
Price (Birr/100 kg)	850	880	900 - 930	930 - 950	1,250 (Flour) 1,100 (Grain)	1,350 1,200
Value Adding	Machanical Threshing	Storage	Cleaning Storage	Cleaning Storage	Milling Sorting	Cleaning Packing
Quality Dry/FM/S melling	3rd grade	2nd grade	1st grade	1st grade	1-2nd grade 1st grade	1st grade
Unit of sales	100 kg	100 kg	100 kg	100 kg	100 kg	5 kg 100 kg (restaurant
Means of transport	Donkey Cart	Donkey cart & Truck	Truck	Truck	Truck	Truck Taxi Hand wheel
Volume	500 kg	5 – 10 MT	7 -10 MT	20 MT	20 MT	100 kg/w
Distance	10 -25 km	5 km	3-5 km	250 km	20 -25 km	3- 10 km

Table 4 - Farming calendar developed through value chain analysis guides in farming and marketing activities (Shasemene Woreda, Oromia Region, Ethiopia); CY 2008

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Teff (Belg)	Δ	Δ	◎F	W	I	H	S	M	M			
Teff (Meher)	M					Δ	Δ	◎ F	W	H	S	M
Wheat						Δ	◎F	W	I	H	S	M
Maize			Δ	Δ◎F	◎F	W	W	I	H	S	M	
Barley	M					Δ	Δ◎F	◎F	W	I	H	S
Haricot				Δ	◎F	W	I	H	S	M		
Potato	Δ	Δ	◎F	W	I	H	M					
Onion			Δ	Δ	◎F	W	W	I	H	S	M	M
Tomato			Δ	◎F	W	I	H	M				
Cabbage			Δ	Δ	◎F	W	I	H	M			

Legend:

Meher: Main cropping season
Belg : Minor cropping season

Δ: Plowing
◎: Planting

W: Weeding
I: Insecticide

F: Fertilizing
H: Harvesting

S: Storage
M: Marketing

VI. Developing an Innovative Agro-based Industry

The SAA agro-processing is working to develop agro-based industry through the establishment of support systems that builds the capacity of technology-users to add value to their crops (Figure 9). The introduction of improved and appropriate technologies builds up the capacity of technology-users, brings about improved value of the products and in general, improvement of the food system.

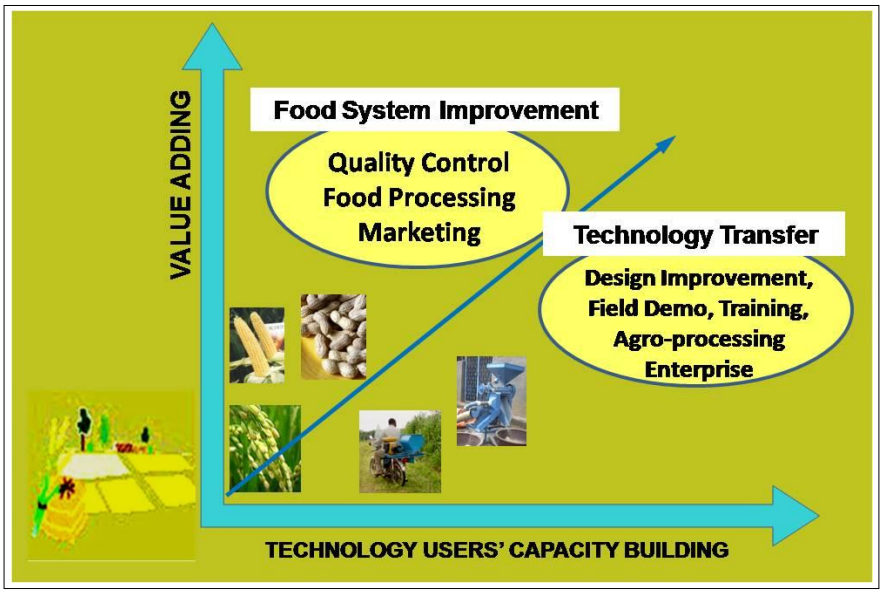

Figure 2- The concept of SAA/SG2000 Agro-processing Program

Improving the food systems provides opportunities for stakeholders including farmers and agro-processors to develop into a productive enterprise.

Through value-chain analysis, constraints are defined and several alternative solutions formulated with various stakeholders, thus the constraints are addressed accordingly.

The programme was started to deal with post-harvest issues such as product quality deterioration, price fluctuation and market access. The programme has evolved over fifteen years and still maintains five major activities to meet its overall objective to develop agriculture-based rural enterprises.

1. Research and development of agro-processing technology and equipment in collaboration with research institutions and local manufacturers;
2. Field demonstrations of improved agro-processing technology and equipment in collaboration with the Ministry of Agriculture and Extension; and local manufacturers;
3. Manufacturers' training to supply improved agro-processing equipment;
4. Promotion of private agro-processing service providers;
5. Strengthen the organizational capacity of farmers groups, especially women.

- ***Research & Development of Agro-processing Technologies and Equipment***

  Fifteen years of experience has shown that the adoption by rural farmers of new technology is key to helping them optimize available resources. Initially, improvements in the design of equipment were aimed at increasing the productivity of local agro-processing activities. Rural farmers involved in processing, mainly women, were shown new methods of packaging of crops such as cassava, maize, soybean sheanut, palm oil and others. New methods of packaging were developed to generate income and reduce post-harvest losses. Concurrently, the needs for a sufficiently stable supply of good quality raw materials, and the urgent need to save the crops from physiological and biological losses, SAA collaborated with the International Institute of Tropical Agriculture (IITA) in Nigeria and the Selam Technical and Vocational College (STVC) in Ethiopia, in the development of appropriate primary processing technologies such as grain threshing, shelling and cleaning. This collaboration yielded to the introduction of small- to medium-scale postharvest and agro-processing machines which incorporated the desired features of mobility, ease of operation and maintenance, and applicable for various crops. Among the machines which are getting popular and affordable to enterprising farmers is the grain cleaner (Figure 10).

The Grain Cleaner

Machine Specifications

- Capacity: Up to 1000 kg per hr ≅ 1 tph (ton per hr)
- Grain Purity: Up to 98%
- Power: ¾ hp electric motor, or 3.5 hp petrol engine
- L x W x H: 123 x 67 x 126cm.
- Weight: 72 kg with motor

Features

- Minimal labour requirement: one to two men to feed and bag grain
- Simple Design: Single shaft, horizontal oscillating screen and centrifugal fan
- Highly Portable: for mobility, two men can carry
- Multi - crop capability: interchangeable screens for different crops

Figure 10 - The grain cleaner being promoted by SAA/SG2000 program

- ***Field Demonstration of Improved Agro-processing Technologies***

  Field demonstration is the most important and effective means of technology dissemination. Farmers can see and experience the potential impact of the technology at first hand. It is most effective if demonstrated by an experienced user who has made a profit using the technology. These entrepreneurs can show the usefulness of technology to neighbouring farmers. The project therefore follows up the introduction of new technology with essential technical support that enables users to make best use of technology, and also provides a steady pool of users who can further promote its adoption. The advantages of field demonstrations are captured in Figure 11.

Field Demonstration of Maize Sheller

Advantages of field demonstration

- Field demonstration is an important opportunity not only to introduce improved technology to farmers, but also to get feedback that can help improve technology design.
- Maize grain can be dried well after shelling. Keeping grain moisture level low is crucial to maintain grain quality during storage.
- New maize sheller can shell 1.2 MT of maize in one hour, while it takes 3 hours with 5 people by hand shelling.

Figure 11 - Field demonstration shows the advantage of the technology and the benefits of applying it. Picture shows maize shelling demonstration by adopting farmer in Ethiopia

Agricultural extension agents require good communication skills to design and manage field demonstrations. Good advance publicity is important so that as many local farmers as possible can participate in the demonstration programme. A good understanding of the local farmers' situation and viewpoint must be taken into account in order to convey best use of a given technology in a given situation. As well as having excellent knowledge of the technology, extension agents must listen to the local farmers and ensure that all their questions are answered. If necessary, the agents must be able to seek further information from researchers to respond to particular problems in the field. Experienced agricultural extension agents derive great job satisfaction from their ability to improve the livelihood of farmers.

As well as advice on new technology, the field demonstration can include information on agricultural engineering and product marketing. If farmers can see the potential of new agro-processing equipment, they'll consider making an investment in the equipment. The most common questions asked by farmers during field demonstrations are, how much is this machine, and where can I get it?

- ***Training Local Manufacturers for Capacity Building***

  SAA's programme also provides technical training to local manufacturers to increase manufacturing capacity. The role of the agro-

processing programme is to identify potential local manufacturers, and then to provide practical training to enable the local supply of agro-processing equipment. The local manufacturers can also then offer a maintenance service to users. This creates new local manufacturing businesses as well as improves agricultural production, and provides a link between industry and agriculture.

Small-scale metal manufacturers faced two major constraints: access to the design of appropriate agro-processing equipment, and frequent turnover of skilled staff. The project provides them with new designs of cheaper, multi-function equipment. Agro-processing equipment is designed with the minimum number of parts to both reduce the total cost of the equipment and make maintenance easy. Agro-processing is a seasonal operation, and therefore multi-function equipment can reduce the amount of time needed to recover the cost of the equipment.

The programme recently organized a manufacturers' training to produce a maize sheller and grain cleaner in Mali (Figure 12). This is among the many other training programs provided to manufacturers of Ethiopia, Uganda, Nigeria, Ghana, and Benin. The training is conducted in a selected workshop in the country to make use of local resources. Training participants are identified based on their skill level and interest in promoting appropriate agro-processing equipment. The trained manufacturers in turn fabricate and sell the equipment to farmers as a commercial business.

Figure 12 - Training manufacturers in Mali on the production of grain cleaner

- ***Promoting Private Service Providers through training on Enterprise Development***

  Threshing and shelling of a harvested crop is the first step in improving the quality of the harvested grains. The project introduced a multi-crop threshing machine to thresh *teff* in Ethiopia in 2001.

  The conventional way of threshing *teff* required three or four men and five or six oxen. The conventional operation cannot separate grain from soil and sand. *Teff* threshing time overlaps with the rainy season, and it therefore has to be done as quickly as possible to avoid being spoiled by rain. During the rainy season, oxen are in high demand to plough farmlands, so finding the number needed for threshing is difficult. For these reasons, farmers were eager to use a private *teff* mechanical threshing service. The enterprise has transformed the threshing scenario from the *"oxen being driven around the threshing site'* to the *"oxen bringing the machine to the threshing site'* (Figure 13).

  In Shashemene, after the *teff* farmers started using mechanical *teff* threshers Shashemene became known for high quality *teff*. Local traders offer a 10 per cent higher price for mechanically threshed *teff*, which gives farmers a good incentive to use the threshing service from private service providers.

  It can be seen from Table 5 that the *teff* threshing service using an improved multi-crop thresher provides good benefits to both the farmers and the service providers. It is proving to be a good business. Service providers can reach break-even point after 325 hours of operation (Figure 14).

Table 5 – Features of *Teff* threshing service business

Description	**Traditional Threshing (Trampling by Animals)**	**Improved Threshing (Multi-crop Thresher)**
• Method	Trampling by animals: four or more Oxen or Donkeys	Mechanical Thresher with 7 HP Petrol or Diesel Engine
• Number of workers	Up to 20 adults and children for threshing and cleaning	1 operator of thresher with 3-4 helpers for cleaning threshed grain
• Capacity	300 kg in 6 hours	250 kg per hour
• Time to thresh 1 ton of *teff* or maize	20 hours (or 3 working days)	4 hours
• Threshing fee in 2008, (ETB: Ethiopian Birr)	Animal fee: ETB 25.00/day per Oxen plus Labor fee: ETB 5.00/day per person	Machine fee: ETB 25.00/hour + Operator' fee: ETB 2.00/hr

Traditional *teff* threshing with Oxen

Private *teff* threshing service provider

Transporting thresher by oxen-pulled cart

Figure 13 - Private Service provision enterprise for *teff* threshing in Shashemene evolved through value chain analysis

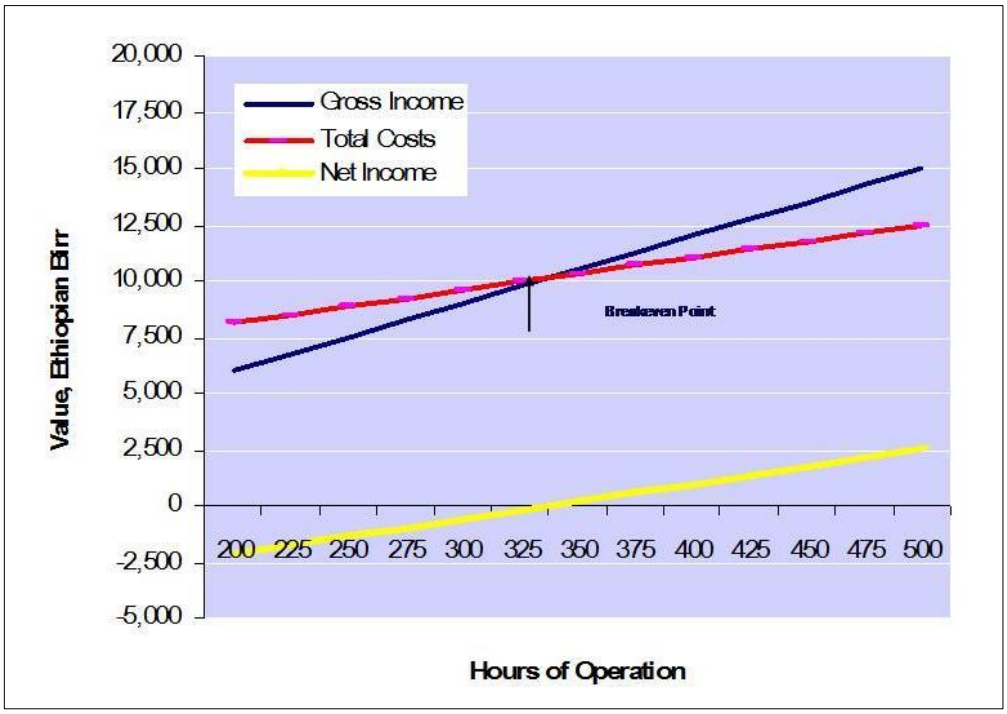

Figure 14 - Economic indices of *teff* threshing business in Shashemene, Oromia Region, Ethiopia. (Source: Halos-Kim & T. Mado, 2005)

Rural farmers can go one step up the market channel by using an agro-processing service. The users in turn feedback advice that helps the private agro-processing service providers respond to farmers' needs. For example, farmers in Shashemene requested a grain cleaner in order to add value to their products. In Ethiopia, farmers and private service providers bought over 100 multi-crop threshers, spreading out of Shashemene to neighbouring districts (Figure 15). One thresher can service up to 150 farmers in one season.

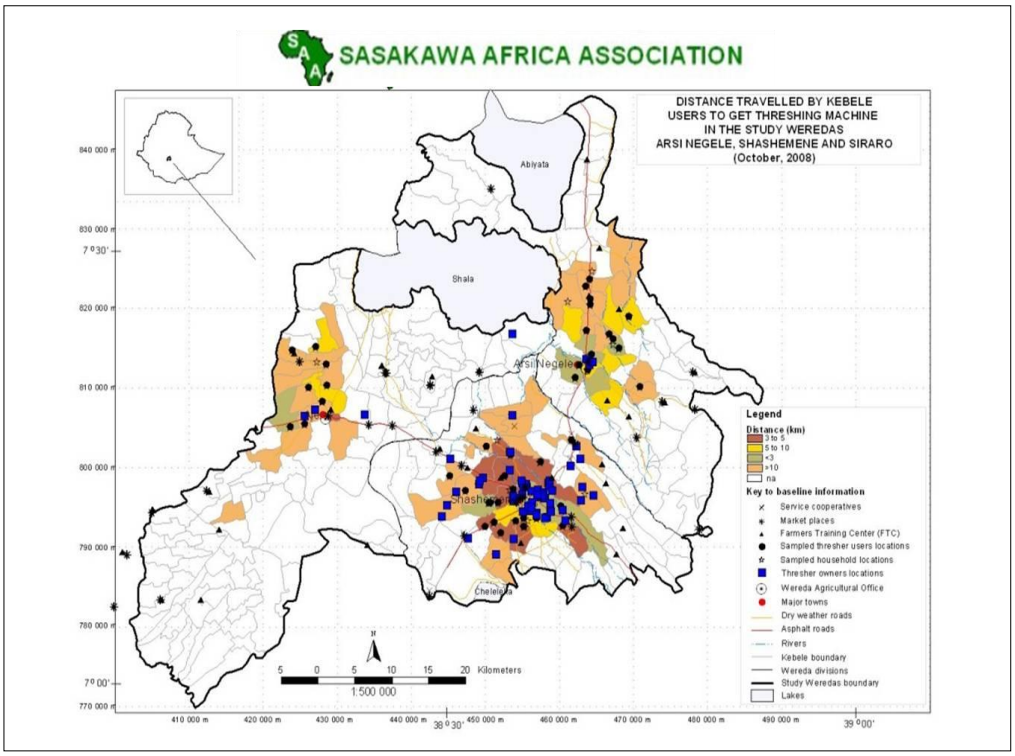

Figure 15- Geographic expansion of *teff* threshing business in Shashemene, Arsi Negele, and Siraro Woredas, Ethiopia (Thresher Machine Service Study, SAA. 2007, Unpublished).

- ***Strengthening the Organizational Capacity of Farmers' Groups***

  The local capacity to process high-quality food products is still low, and many SSA countries still import large quantities of processed foods. The programme encourages rural farmers to use locally available harvested crops to produce marketable food products both for local community and major cities. These food products are based on household recipes.

  Technical advice is provided by Home Economists to rural processors to improve nutritional value and hygiene to make the products more market competitive.

  Food processing can also contribute to the price stability of local agricultural products. For example, the price of groundnut in *Babile* District in Ethiopia increased more than 20 per cent since a farmers' co-operative started the production and sale of groundnut butter and groundnut-based cake. These products, popular in the local community and in major cities, illustrate how farmers' groups can go up the value

chain by applying agro-processing technology and marketing development.

Agro-processing and value-adding activities can widen the size and type of market for locally produced food items. The programme is encouraging more groups of rural women to mine their household knowledge to develop potential food products for future agri-business.

The SAA/Agro-processing Programme works closely with Home Agents (female extension agents) and women farmers. Rural women tend to have less access to improved technology and information; there are also fewer Home Agents than male extension agents. The role of the Home Agents in rural community development has not been well recognized by policy makers, nor are they well supported financially.

SAA's work with the Home Agents and women groups had built up confidence both of the extension agent and the clients, and food processing business is emerging. The women are being sensitized on the importance of good food processing and to generate income from it. Good packaging, product presentation, and quality control are also taught. Home Agents help support efforts of product quality control by regular visits to their groups. The better the quality control, the higher the sales recorded consequently the greater earnings for the group.

Many more food products are now being processed by the women groups and sold in the local markets or in their own food kiosk/shops. Each item is labelled with the product name, the name of the producer, variety, volume and price. This activity is captured in Figure 16.

Institutional and technological innovation can play a crucial role in improving market access to resource-poor rural farmers. The examples above show the increased market potential that can be created through institutional development and simple agro-processing activity. With the help of Home Agents who introduce better processing technology and methods, members create innovative quality control systems, which in turn improve market access. Success is down to the commitment of Home Agents, who are trusted by the rural women's groups. Increasing the numbers of Home Agents would make a real difference in improving the transfer of appropriate technologies to rural women farmers.

Training: packaging & quality control by Home Agent

Sample taste test packs of products for consumers

Food products prepared by Women's Groups

Bottled groundnut paste for urban consumers

Kiosk stuffed with ground condiments, others

Successful Partners: Home Agents and Women Processors

Figure 16 - Agro-processing business by women groups developing facilitated by female Home Agents

VII. The Role of the SAA Agro-processing Programme

Sasakawa Global 2000 Agricultural Extension Project (SG2000) has focused on the dissemination of production enhancement technology since it started in 1986. The assumption was that the marketing of agricultural input and output would be taken care of by the government or private sector, however, the absence of this proved a major constraint for technology dissemination.

Four countries (Ethiopia, Mali, Nigeria and Uganda) recently began to apply a market-oriented approach. SG2000 also began to focus on institutional building to enhance marketing capacity through the formation of rural farmers' groups to enhance market access.

In Uganda, SG2000 started a One-Stop Centre (OSC) Scheme. SG2000 in Mali now focuses on primary processing and grain marketing through 20 selected Development Centres at village level. Development centres are integrated with local financial institutional development schemes, called CREP (*Caisse Regionale d'Epargne et Pret*) to facilitate credit service.

In Nigeria, SG2000-sponsored institutional development features the application of a crop commodity-base groups such as QPM (quality protein maize) or NERICA (New Rice for Africa) in selected villages where several production, storage, processing, utilization and marketing components integrate as a model.

SG2000, Ethiopia focuses on farmers' co-operatives as a base for technology dissemination. The individual SG2000 country projects show the importance of rural institutional development alongside efforts to promote improved technology.

Increased demand for improved agro-processing technology adds value to agricultural products. As shown in their project design matrix (PDM), Table 2, each country project applied a market-oriented and value added approach to increase the availability of products, and improve economic value.

Through application of the value chain approach, the agro-processing industry has gained its position in the market place. The chain actors are sensitized on their roles and takes up value-adding technologies to pursue their businesses. Women groups are more confident in processing their crops and participate actively in the market.

The role of the SAA regional agro-processing programme is to identify the actors at each level of the value chain, analyze the constraints and provide

technical support to national projects in order to link chains effectively to improve rural farmers' market access.

The value-chain support role by SAA regional agro-processing programme is illustrated in Figure 17. The programme links the various players to provide the necessary value chain supports in the production, storage and processing of agricultural produce and makes sure that a favourable environment is provided at all stages by the various chain players. The process results in the increased economic value of farm products.

Value-chain approach to promoting agriculture-based enterprise helps understand the requirements of the business and the SAA agro-processing program will continue to play its value chain support role to make agro-processing a profitable enterprise.

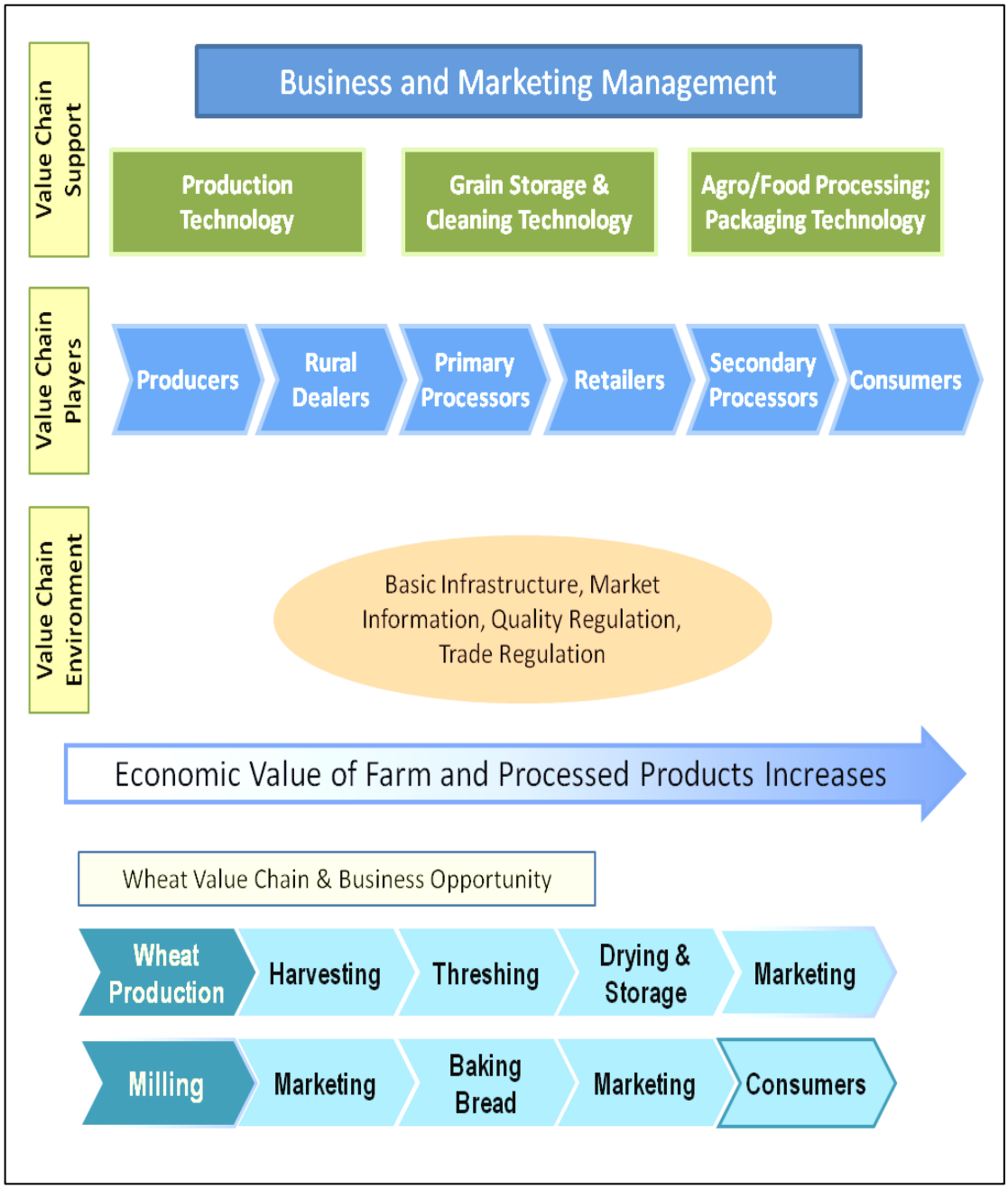

Figure 17 - Value chain activities that support business opportunities. An example is given for market opportunities within the wheat value chain

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Edited by:

- *Raitt Orr & Associates Ltd.*, London SW1 &
- *L. Halos-Kim*, Sasakawa Africa Association, Ethiopia