

TOOLKIT
for
Developing and Implementing
Poverty Reduction through Irrigation and Smallholder Markets
(PRISM) Programs

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International Development Enterprises

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Overview

PRISM is a knowledge base around the goal of poverty reduction. The PRISM Guidelines explain the goals and principles of PRISM and provide an overview of the phases of the PRISM strategy. This Toolkit provides specific tools and strategies that can be used to develop, implement, monitor and evaluate PRISM. These tools are flexible and adaptable and can be used and revised as needed.

The Toolkit is organized into sections, corresponding to the phases of developing and implementing PRISM projects:

Section 1: Tools for Designing a PRISM Project includes market opportunity identification and assessment; gender analysis; a general review of irrigation potential; selecting a promising opportunity; intervention design; partnership development.

Section 2: Monitoring and Evaluation of PRISM Projects provides tools to monitor and evaluate the effectiveness and efficiency of PRISM projects.

Tools for Designing a PRISM Project

Designing an intervention to increase smallholder income requires an understanding of the dynamics – driving forces and constraints - of various sectors in which smallholders could potentially participate, and identifying potential sources of leverage within these sectors. This overall process is illustrated in Figure 2: Diagnostic Procedures for Leveraged Interventions, below, and described in detail in this section Toolkit.

Identifying Promising Market Opportunities for Smallholders

Guiding points to facilitate identification of market opportunities that increase small-farm income include:

- Look for promising market opportunities and explore many different ideas, even if these ideas seem crazy. The PRISM approach is based on the business model, so it is important to have an entrepreneurial outlook and approach when exploring different opportunities.
- Select opportunities that provide significant income for smallholders and/or opportunities to meet the food needs of smallholders.
- Focusing on crops that are currently being grown can be cost-effective, minimize risk and utilize existing smallholder knowledge and skills.
- Focus on sub-sectors with low start-up costs and sub-sectors that promise a rapid return on investment. This helps ensure that smallholders can invest and maintain and increase investments in the future.
- Focus on sub-sectors with large and growing demand.
- Focus on non-perishable crops.
- Consider ways to minimize smallholder risk (e.g. crop diversification and ensuring that smallholder household food needs are met helps to minimize smallholder risk). See below for additional discussion on risks faced by smallholders and reducing those risks.
- Focus on high-value crops for which smallholders have or can develop a comparative advantage (e.g. crops that require a high degree of labor intensity or attention to detail and/or crops that benefit from intercropping).
- Focus on crops for which smallholders can be organized as a group and assisted to compete effectively with industry.
- Examine sub-sectors where gains can be made through improving land and water productivity rather than labor productivity.
- Examine areas where processing facilities are available.
- Focus on sub-sectors that sustain the natural resource base.
- Understand the value chain and identify how to integrate smallholders into the value chain.
- Examine off-season production potential through irrigation to assess whether this would generate additional income.
- Examine possibilities for import substitution.
- Examine possibilities for differentiation of smallholder products (through branding, etc.).
- Focus on crops that rely on the unique land or produce characteristics (regional branding, agro-ecological advantage)
- Examine emerging markets.
- Consider the value chain and sustainability from beginning, during the process of identification, assessment and selection of opportunities.
- Formulate projects around expressions of interest from private companies, which can provide valuable assistance (e.g. free market assessments, in-country technical expertise, and contracting assistance).

Figure 2 -- Diagnostic Procedures for Identifying Leveraged Interventions

A. Understand Dynamics

Usual suspects

- market demand
- technological change
- input supply
- profitability
- large firm behavior
- barriers to entry
- policies

1. Driving forces
Channel 1, 2, ...

2. Constraints
Channel 1, 2, ...

3. System dynamics and potential interventions
 a. thriving channels and niches
 b. waning channels
 c. opportunities for smallholders
 d. what's required to get them there?
 e. who can supply those requirements most cost effectively?

B. Identify Sources of Leverage

4. Sources of leverage
 • large-firm intermediaries
 • clustering
 • policies

C. Convergence Identifies Opportunities for Leveraged Interventions

5. Opportunities for leveraged interventions
 • policies
 • large-firm intermediaries
 • partner institution provides
 • direct provision?
 • non-intervention

Figure 2 from GEMINI Manual with permission from Steve Haggblade.

Characteristics of Attractive Sub-Sectors for Smallholder Market Development

In selecting a sub-sector, it is useful to determine which criteria, or characteristics, of the sub-sector are most important. IDE has identified the following characteristics of sub-sectors that often benefit smallholders:

- Large number of smallholders served
- Low risk to farmer (see section below regarding risk)
- Short payback period
- High potential income impact
- Expanding market
- Full-spectrum markets available (low-end to high-end, local to export, season to season)
- Key “logjams” in the value chain are easily identified and resolved at low cost
- Low entry cost for smallholders
- Low requirement for new knowledge by smallholders
- More intensive crop management adds extra value (capitalizing on smallholders’ labour advantage)
- Involvement of women in production and marketing
- Positive or neutral environmental impact
- Synergy with other intervention programs
- High donor interest

Questions to Help Identify Promising Opportunities for Smallholders

Questions to understand the project context and the smallholder context are provided below. These questions focus on understanding the situation of smallholders, the natural resource base, markets, the socio-cultural environment, partnership opportunities, etc.

Questions that help planners understand the **project context** include:

Poverty: Who are the poor? Where are the poor? When are they poor (e.g. chronic poverty or seasonal poverty)? Approximately how many are poor? What are the population patterns (density, migration, urbanization)? Is there a need to help the poor meet nutritional needs or raise income or both? What are some ways to identify and reach those poor?

Natural resources: What are the current land-use patterns (soil conditions, cropping systems)? How are these changing? Are there important macro-level natural resource issues that may impact land and/or water use (large-scale deforestation, conflicts over natural resources, desertification)? Are there laws / policies / customs at the regional, national, or international level that impact use or control over natural resources?

Markets: Are there laws or policies at the regional, national, or international level that impact market access? Are there current/potential businesses or business development services that could impact a large number of smallholders? Are there supply systems to support new crops? What are the demand patterns and trends in demand? How do government policies impact potential sub-sectors?

Socio-cultural: Are there ethnic groups with differing roles in potential sub-sectors? What laws/policies/customs impact gender use or control over resources, access to the market or role in meeting household nutritional and other needs? Does this role and status vary in different regions? Are these laws / policies / customs changing?

Partnership: Are there potential partners at the national level, regional or local levels, such as government agencies, private sector, research institutions, donors, or NGOs?

Information to address the questions above can be gathered through literature reviews, collecting and analyzing secondary data from government agencies, research institutes, business associations, local universities, donor agencies, other knowledgeable sources and field visits. This information provides an

understanding of the patterns and trends affecting potential projects. It also helps identify regions and markets where a PRISM intervention would be successful.

Questions that help planners understand the **smallholder context** include:

Water: Usually, water is the single most important factor limiting smallholders from earning more income. Other inputs generally do not limit smallholders. For example, labor is usually widely available and not expensive. Seed, fertilizer, and pesticides are required in small quantities. Water, however, is heavy and is required in large quantities. Natural rainfall is often variable. Reliable crops require a reliable water supply and efficient use of that water supply. See section below for information and data collection recommendations regarding water.

Crops: What crops are traditionally grown and in which regions? Which of these crops are high-value? Can these crops be stored? Can these crops be exported? Which crops can generate the most income for poor farmers? Are there gender or environmental implications of the crop choice?

Land: What land ownership and land use patterns exist in the region(s)? Do small farm families own their land? Do they lease the land? Do they share the land with other smallholders? Are their rights to use the land permanent? Are they willing to invest in equipment needed to grow crops on the land?

Soil and Inputs: What are the soil types for the given region(s)? What are the pest issues for a given region and crop? What are the pesticide and fertilizer requirements? Does the smallholder gather their own seeds or purchase them? Can these inputs be easily obtained at reasonable prices?

Labor: What are the labor requirements for the crops? How do these requirements change during the growing season? What are the gender aspects of labor? What are the likely impacts of intervention on the labor equation?

Credit: What (if any) are the potential sources of credit? Are there other credit systems in the region/country that might be made available? Are there ways of organizing groups of smallholders to obtain credit?

Markets: What are the potential local, regional, national, and international markets? How 'open' are the markets - can smallholders access the markets and receive a fair price? What is the price of the crop at the market? Does the price depend on quality? How do the prices vary in different seasons?

Transport: What is required to bring produce to the market? What is the transportation cost? How much time is needed? Will the roads damage sensitive produce? Do smallholders transport the produce themselves, organize to transport it, or sell to middlemen at the farm gate?

Organizations: What organizations can help the smallholder obtain knowledge, credit, inputs, access to water, marketing, and transport?

Information to answer the questions above is gathered primarily through interviews with the smallholder farmers and local smallholder organizations. Other valuable sources of information include local agricultural extension agents, non-governmental and governmental organizations.

Criteria for Identifying Promising Opportunities for Smallholders

The table below presents criteria that IDE has used to identify promising opportunities for smallholder income generation. This table also provides recommended data that may be collected to assess potential opportunities for developing PRISM.

Table 1: Criteria for Identifying Promising Opportunities

Criteria for Selecting Promising Opportunities	Details	Recommended Data to be Collected
Potential to benefit smallholders	<p>Benefits accrue to smallholders who own between .05 and 2.5 acres of land</p> <p>Potential for increased revenues at all levels of the sub-sector</p> <p>Projected increases in sales, profits or returns to labor</p> <p>Low risk for smallholder (see below for more information on smallholder risk)</p>	<ul style="list-style-type: none"> • Number of smallholder farmers involved (current and potential), disaggregated by gender • Capital, credit, and technology available or potentially available to smallholders • Potential to effectively and efficiently organize smallholders • Identification of high-value crops in which smallholders have an advantage • Capital investment costs for smallholders and return on smallholder investment (amount of return and timeframe of return) • Number of business development service providers (current and potential), disaggregated by gender • Increased potential for income generation of small enterprises, including smallholders, and service providers, disaggregated by gender • Primary crops grown in area • Current use of high-yielding seeds by small farmers • Seasonality of identified crop and assessment of price fluctuation by season • Cost advantages for smallholder involvement • Smallholder able to meet household needs • Diversification of smallholder crops • Smallholders continue to grow current crops • Smallholder risk (see risk section below) • Potential agro-industrial competitors in sub-sector • Average daily wage for rural labor and demands (seasonal fluctuating) on rural labor • Agricultural markets within a selling distance for the small farmer
	<p>Potential to positively benefit women</p> <p>Increase women's access to and control over productive assets / processing / marketing</p> <p>Increase skills</p>	<ul style="list-style-type: none"> • Different roles, attitudes, and interests of women and men in agriculture and the market economy • Social relations between women and men pertaining to their access to, and control over resources, benefits and decision-making processes • Different perspectives of women and men toward potential interventions • Current and potential number of women who are self-employed, own businesses or work as employees of other firms in the sub-sector • Differential perspectives, roles, practical needs, and strategic interests of women and men in the sub-sector, household, economy, and project area.

Criteria for Selecting Promising Opportunities	Details	Recommended Data to be Collected
	<p>training and capacity development opportunities for women</p> <p>Increase women's income</p> <p>Decrease women's workloads</p> <p>Maintain or improve social relations within the household and the community</p>	<ul style="list-style-type: none"> • Social relations between women and men pertaining to their access to, and control over resources, benefits and decision-making processes. • Intervention would increase women's access to and control over productive assets/processing/marketing
	Potential for employment generation	<ul style="list-style-type: none"> • Current employment statistics, disaggregated by gender • Estimates of employment projects, disaggregated by gender • Potential for enterprises (large and small) to create new employment opportunities as the sub-sector develops or expands
	Benefit/cost ratio	<ul style="list-style-type: none"> • Benefits to smallholders outweigh the costs of facilitating support services. This includes quantifiable benefits (net financial benefits compared to program costs) and non-quantifiable benefits (e.g. social benefits, policy benefits)
Agricultural potential for smallholders	Water availability, access and quality	See section below for more details.
	Land availability, access and quality	<ul style="list-style-type: none"> • Land availability • Land use patterns (including land clearing and land alteration practices) • Access to land with agricultural potential • Soil types, quality and fertility • Average farmer plot size and number of plots • Percentage of irrigable land • Current soil management practices and sources of degradation

Criteria for Selecting Promising Opportunities	Details	Recommended Data to be Collected
		<ul style="list-style-type: none"> • Currently grown crops • Agricultural imports, and imports related to agricultural production • Land tenure rights (ownership, tenancy, landless)
	Physical environment can support high-value crops without environmental degradation	<ul style="list-style-type: none"> • Number of high value crops possible without negative environmental impact • Number of high value crops possible but not grown • Number of (all) crops currently grown in the area • Percentage of farmers using drip irrigation • Percentage of farmers using treadle pumps • Percentage of farmers using bucket irrigation • Current farming techniques (e.g. pest management, crop diversification, use of inputs) • Projected impact on land, water and soils of current agricultural practices
	Sufficient average landholding size	<ul style="list-style-type: none"> • Average size of smallholder farms • Plot sizes for the farmers • Number of plots of land that the average farmer owns • Percentage of farmers per plot size
	Sufficient number of farming households in the marketshed	<ul style="list-style-type: none"> • Percentage of households with livelihoods in agriculture
	Potential for increases in productivity	<ul style="list-style-type: none"> • Potential for technologies or management systems that increase the productivity/earnings of smallholders or enterprises in the sub-sector
Minimize negative environmental impact	Sub-sector development does not have significant negative impacts on the natural resource base	<ul style="list-style-type: none"> • Potential environmental impacts (direct and indirect impacts at the input, on-farm and output levels)
Existing or potential market opportunities (based on market demand and	Links to larger markets	<ul style="list-style-type: none"> • Access to markets that currently or potentially serve large markets (e.g. national, regional or export markets)

Criteria for Selecting Promising Opportunities	Details	Recommended Data to be Collected
growth potential)	<p>Evidence of strong demand for products being produced</p> <p>Demand for products exceeds supply</p> <p>Unmet demand from municipal authorities or large public works projects</p> <p>Sub-sector has potential to be competitive in relation to larger (regional / world) market</p> <p>Number of current market participants and number expected to operate in the sub-sector</p>	<ul style="list-style-type: none"> • Information on location, size, and potential for growth • Market prices for select vegetables, grains, cash crops • Opinions and data from key informants on market trends and sub-sector competitiveness • Market analysis to understand consumer behavior and preferences (e.g. price, packaging, quality) • Information from existing statistics/studies • Examples of businesses that have problems meeting demand • Current or past initiatives (even failed ones) by small farmers, businesses, organizations • Comparisons within the region (based on opinions from key informants of market information) • Number of business development service providers (current and potential), disaggregated by gender • Seasonality – assessment of price fluctuation by season • Gender roles
	Sufficient market size/number	<ul style="list-style-type: none"> • Number of markets in each area • Market players • Market institutions • Trends in demand patterns
	Adequate infrastructure linking markets	<ul style="list-style-type: none"> • Miles/kilometers of paved roads and road conditions • Percentage/total population linked to markets by surfaced roads • Average time/distance from household farms to markets • Average distance from farms to paved roads • Transport facilities • Average cost for farmers to transport crops (50 kg) to market • Availability/access to refrigeration and/or storage facilities

Criteria for Selecting Promising Opportunities	Details	Recommended Data to be Collected
	Sufficient market sector for agriculture	<ul style="list-style-type: none"> • Percentage of environmentally possible high value crops currently sold in the area markets • Number of wholesale/retail points of sale for technology and inputs • Size of the manufacturing base capable of producing irrigation components that is linked to a market • Number of manufacturers capable of producing irrigation equipment that have plants located in the area marketshed • Number of distributors of manufactured goods in the marketshed • Size of the agricultural input production base linked to the market • Percentage of the market devoted to agriculture (number of sellers, number of buyers, percentage of sales volume) • Availability of credit and/or subsidies
	Potential for value-addition to smallholder products	<ul style="list-style-type: none"> • Potential for enterprises to add value to raw materials and gain higher earnings • Market demand for value-added products • Standards • Packaging • Storage
	Opportunities for upstream and downstream linkages	<ul style="list-style-type: none"> • Description of the different kind of transactions that place among domestic market actors in the sub-sector • General description of the volume and number of these transactions between a given number of firms • The number and volume of transactions that take place among domestic market actors in the sub-sector • Potential forward/backward linkages between large and small enterprises • Large buyers overlook micro-, small-, and medium scale enterprises as a source of supply or are unable to organize them to meet their demands
	Potential for increases in productivity	<ul style="list-style-type: none"> • Potential for technologies or management systems that increase the productivity/earnings of enterprises in the sub-sector
Socio-economic / demographic factors	Low household income in the marketshed (poverty higher than national average)	<ul style="list-style-type: none"> • Average household income (percentage of income from farm, percentage of income from non-farm sources). • Information on differences in poverty within communities and within households. • Ethnic/caste/religious and gender analysis of poverty

Criteria for Selecting Promising Opportunities	Details	Recommended Data to be Collected
	Ethnic / caste / religious groups accept and succeed with market-based interventions	<ul style="list-style-type: none"> • Ethnic/caste/ religious composition and attitudes towards market-based interventions
	Sufficient human labor potential	<ul style="list-style-type: none"> • Human labor potential available for agriculture (including migration rate, disease rates, rates of child-headed households, etc.) • Total population of the area and population density • Average daily wage for rural labor, demand for rural labor and labor capacity • Household family size (average range)
Enabling environment	Host government priorities, policies, support project intervention	<ul style="list-style-type: none"> • Government policies that affect small farmers and small-scale irrigation, including: <ul style="list-style-type: none"> – land use, land access and land tenure policies – water use and access policies – marketing of appropriate technologies – agricultural commodity pricing – subsidies – property rights – rule of law – export – transportation – marketing – effective institutions • Legal differences between women and men in the agricultural sector (e.g. land ownership and tenure rights, taxation)
	National, regional and local political processes enable project intervention	<ul style="list-style-type: none"> • National, regional and local political systems and informal decision-making structures and processes • Legal aspects of registering and working as an NGO • Government labor laws and documents required to work in country
	Donor priorities and policies agreeable to project intervention	<ul style="list-style-type: none"> • Donor priorities and policies that impact on project area selection
	National and	<ul style="list-style-type: none"> • National and local security history and trends, including

Criteria for Selecting Promising Opportunities	Details	Recommended Data to be Collected
	local security stable	travel restrictions and/or security concerns
Other	Potential for collaboration	<ul style="list-style-type: none"> • Donors (bilateral, multi-lateral), NGOs, and CBOs that are active in the area, their activities and attitudes and potential for collaboration • Government extension and agricultural university organizations that conduct relevant research, demonstration, educational programs, and promotional projects
	Logistics of project implementation feasible	<ul style="list-style-type: none"> • Educational level of national staff • Banking system, currency regulations (e.g. possibility to open hard currency account), currency exchange rate • Availability and cost of housing and office space • Road conditions • Cost and availability of vehicles and fuel • Quality of communications networks in the region

Assessing Smallholder Market Opportunities

Understanding Smallholder Opportunities

Guiding points to understand smallholder opportunities include:

- Examine 3 – 4 key crops, with the flexibility to broaden the examination if other possibilities emerge. This number allows for the possibility of smallholder crop diversification.
- Understand the primary actors operating in the input-production-output chain of the sub-sector (producers, manufacturers, input suppliers, wholesalers, retailers, etc.). This includes understanding the roles of women, ethnic groups and religious affiliations of smallholders as they relate to the sub-sector.
- Understand the entire vertical chain of the sub-sector, because one stage of a sub-sector affects other stages. Understand the implications of sub-sector structure for current and future economic performance of the sub-sector.
- Understand forces of change affecting the sub-sector, such as changes in technologies and supplies of competing products, and the implications of those changes on sub-sector performance.
- Understand the dynamics of national and international demand, which pulls goods and services through the vertical chain.
- Understand market channels and how well those coordinate activities of actors in the sub-sector, the incentives to improve productivity, competition between/among channels and how it might be modified to achieve better economic performance.
- Understand current and potential environmental impacts of the sub-sector.
- Understand the role of financial markets in relation to the sub-sector, including access to finance, current financial sources, whether finance improves smallholder opportunities, if finance is a constraint and at what level, and what financial services are needed.

The following questions may assist in the process of identifying which channels smallholders can compete:

- Quantify which channels are growing and which are waning.
- What market intermediaries are key to connecting smallholders to those opportunities?
- Measure relative profitability (returns to labor or land) of principal alternatives to see where smallholder incentives lie.
- Who imposes quality, grades and standards? Can smallholders meet these requirements?
- Can the smallholder sector compete effectively with the agro-industrial sector through organizing smallholders, identifying agricultural products where smallholders have an advantage, and developing integrated services designed specifically to meet smallholder needs (e.g. capital, credit, technology, training, information systems)?
- Can smallholder access any of the three main sources of leveraged interventions (large firm intermediaries, policies, geographic clustering)?

Information to assess smallholder market opportunities can be gathered from key informants in government, civil society and the private sector using:

- Key informant interviews
- Focus groups
- Validation workshops with smallholders, small enterprises, government and civil society organizations

It may be useful to consider the following points when gathering information:

- Ensure that the questionnaires and surveys are not too long or complex;
- Ensure that the questionnaires and surveys are flexible and allow for open-ended discussion where needed;
- Pre-test and finalize all tools before using them on a large scale;
- Use two people to gather information, which allows one person to ask questions and the other person to take notes;
- Although it may be necessary at times to contract out information-gathering, if time and resources are available, it is optimal to collect this information “in-house”.
- Selective visits to production and marketplace facilities and to important infrastructure may be useful to verify information gathered from sub-sector participants and to provide additional information if good data are unavailable.

The survey forms in Appendix A can assist in the process of identifying opportunities and constraints for smallholders in a particular sub-sector under examination. These surveys are useful to gather information regarding participants in the sub-sector; market relationships; advantages and disadvantages of current crops; volume produced, sold and consumed and profits in different seasons; transport; consumption preferences; constraints, etc. The surveys were developed and used by IDE in Cambodia and focus on the vegetable sub-sector, but the forms can be modified for use in any context for any sub-sector. Appendix A provides a survey form for each of the following actors in the value chain: input dealers; farmers; distribution players; consumers; and restaurants.

Sub-sector Mapping and Sub-sector Analysis

The analysis of market opportunities can be confirmed and refined through sub-sector analysis. As there are many guides to sub-sector analysis, these tools are not duplicated here. Examples of sub-sector analyses completed for PRISM are provided in the following appendices:

1. *Appendix B: Pineapple Sub-sector Market Assessment in India* provides findings from a pineapple sub-sector assessment, including the structure and dynamics of the sub-sector; sub-sector actors; supply chain and product flow; and sub-sector map.
2. *Appendix C: Vegetable Sub-sector Market Assessment and Intervention Design, Bangladesh* provides an overview of market assessment area; market analysis findings; and two intervention designs developed for the vegetable market describing the market service, market information channels, supply of the service, potential impact, financial sustainability, facilitation activities, and intervention methodology.

Preparation of a sub-sector map provides a graphic representation of the major actors and their interrelationships and facilitates identification of participants to interview. The pages below present the following maps:

1. *Figure 1 – Sub-sector Mapping Conventions* outlines a general sub-sector mapping form.
2. *Figure 2 - Sub-sector Map of the Vegetable Sub-sector at the Pokhara Market in Nepal* shows a vegetable sub-sector map developed by IDE-Nepal.
3. *Figure 3 - Banana Product Flow Map* depicts a simplified sub-sector map for the Jamner marketshed area in India.
4. *Figure 4 - Sub-sector Map of the Porker Sub-sector* map the pork sub-sector in the Dakrong District, Quang Tri Province of Vietnam.

Figure 1 -- Subsector Mapping Conventions

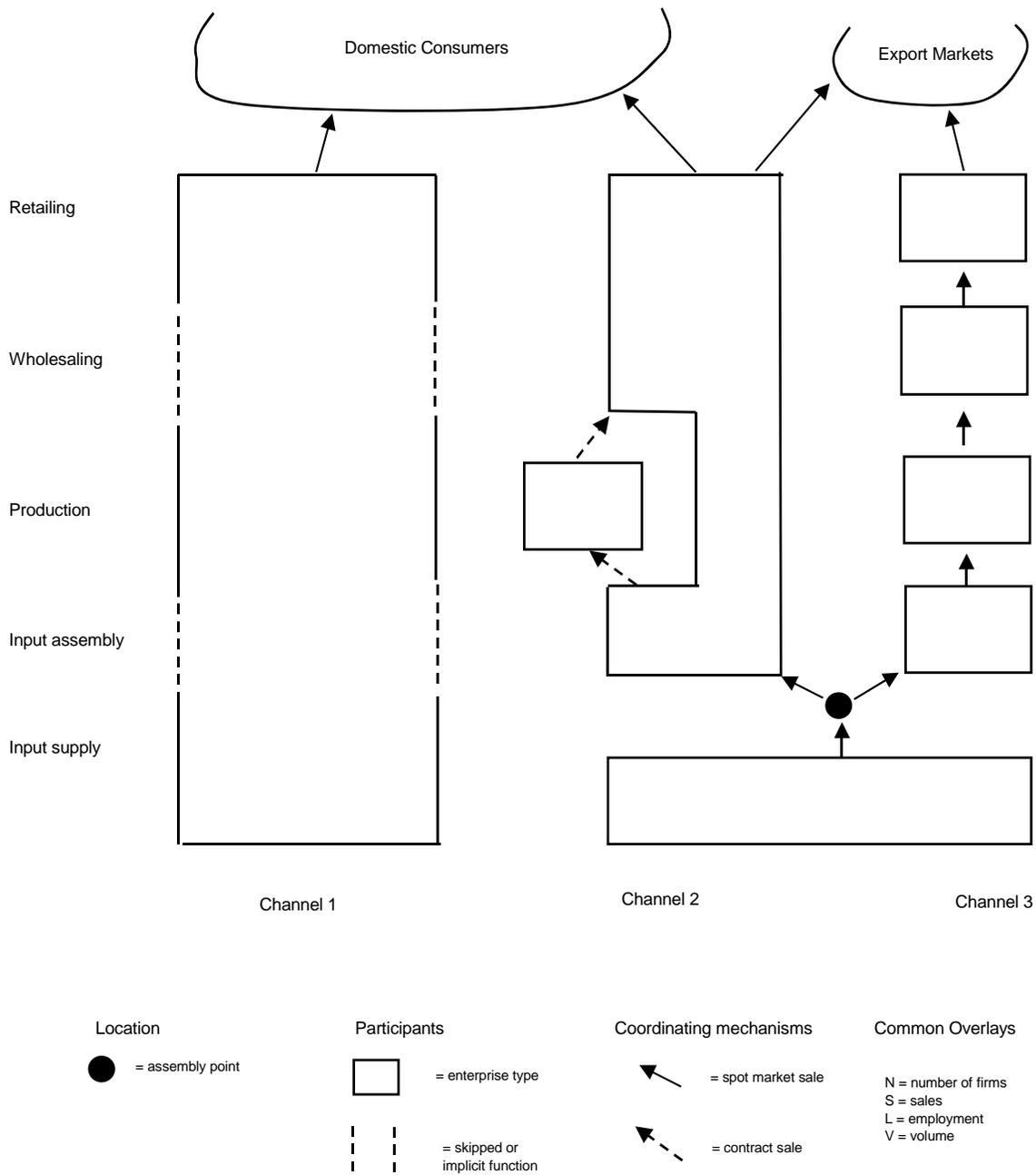


Figure 1 from GEMINI manual, with permission from Steve Haggblade.

Figure 2: Sub-sector Map of the Vegetable Sub-sector at the Pokhara Market in Nepal

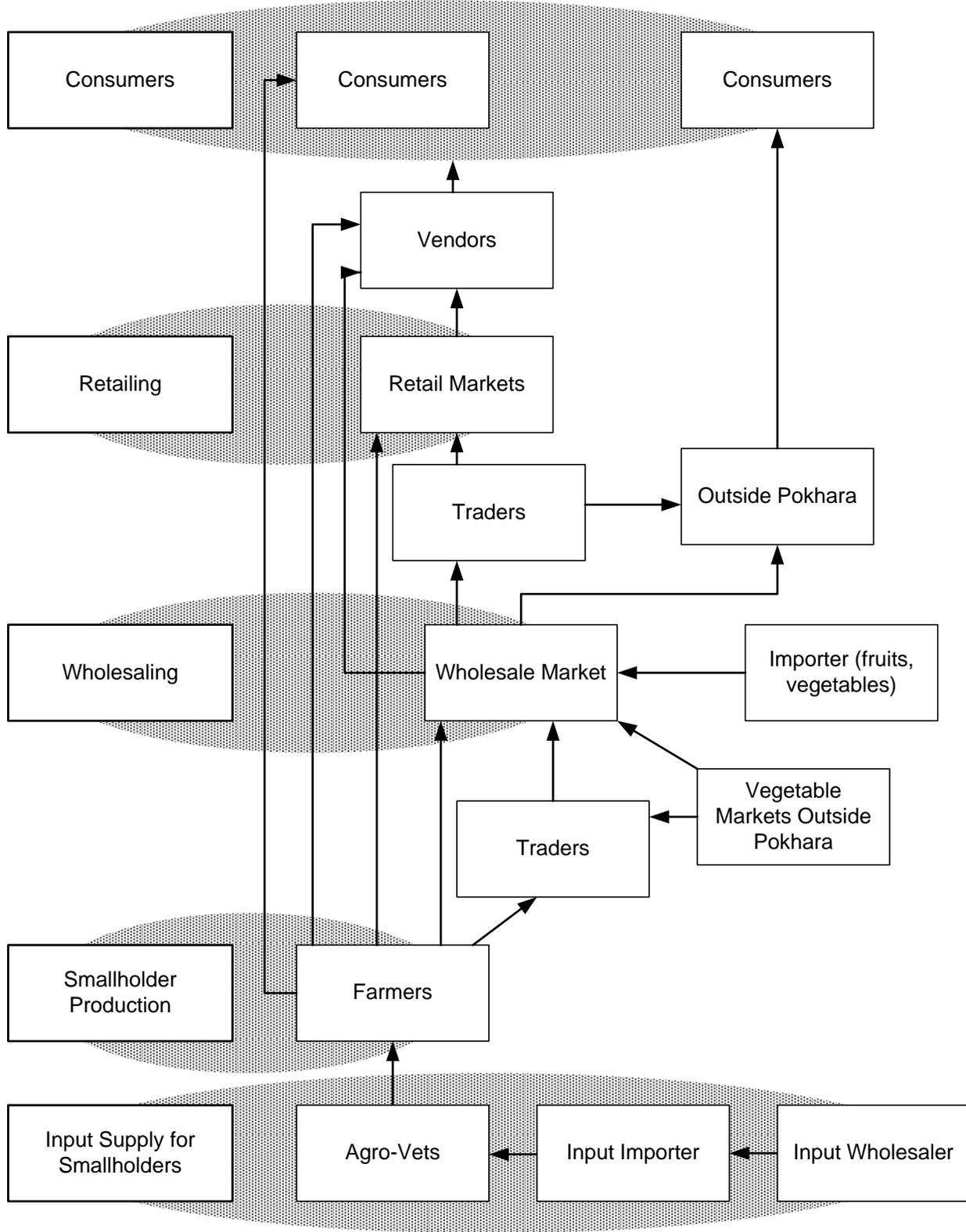


Figure 3: Banana Product Flow, Jamner marketshed area, India

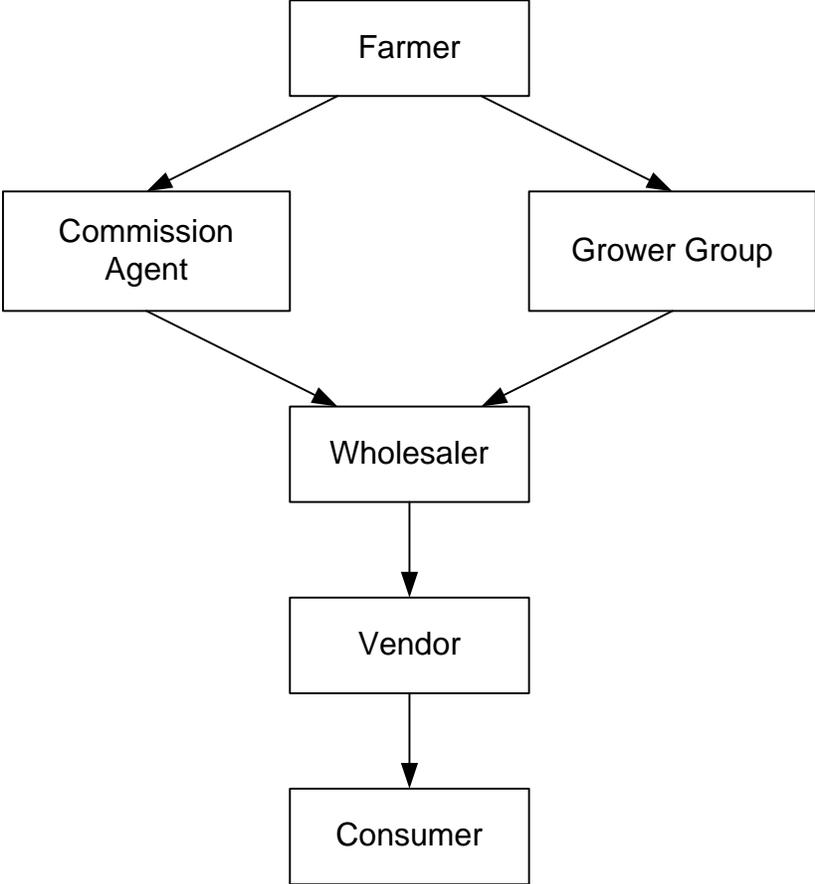
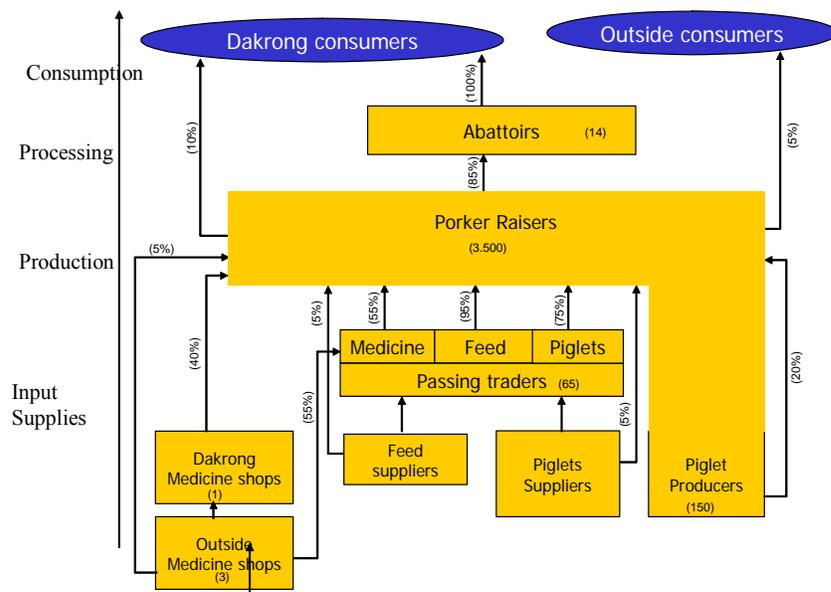


Figure 4: Sub-sector Map of the Porker Sub-sector, Vietnam



Identifying Key Constraints in the Sub-Sector

Once channels have been identified in which smallholders can compete, it is useful to examine what prevents smallholders from accessing the growing channels. The sub-sector map can be used to identify key linkages in input, on-farm and output markets. Constraints may occur at one of three levels in the vertical value chains within which smallholders operate:

1. The input market - the enterprises and organizations that provide the goods, services, and information required for agricultural production.
2. The small farm - the household production unit that consumes inputs to cultivate crops for self-consumption and for sale to output markets.
3. The output market - the enterprises and organizations that provide the goods, services and information required to move the small farm production from field to consumers at economically rewarding prices.

When identifying constraints within the value chain, it is helpful to provide enough detail to facilitate a specific solution. It is also useful to state who specifically is affected by the particular constraint.

Analyzing constraints at each market level and in each constraint category may result in a long list of market constraints. In order to focus on promising areas of intervention, constraints can be prioritized to identify “key logs and in the logjam” that can benefit large numbers of smallholders. Such leverage points may be found by identifying nodes in the value chain where a small number of firms act as intermediaries for a large numbers of smallholders or by taking advantage of geographic clustering of similar enterprises or production systems or by identifying policy levers that will remove constraints for many market actors at once. The following questions can also assist in this process:

- What are the sources of leverage: large firm intermediaries, geographic clustering, and policy levers?
- How many smallholders will benefit? By how much?
- What is the least costly means of addressing smallholders’ needs?
- Will the envisaged intervention be cost-effective? Will it generate more benefits than costs?

Constraints faced by smallholders typically fall into one or more of the following categories: technology/product development, market access, input supply, finance, policy, management/organization, infrastructure, information, large-farm competition, and/or social, cultural or legal constraints. *Table 2: Potential Smallholder Constraints* below lists these common categories of constraints. The table also provides examples of each category of constraint at the input level, small farm level, and output market level.

Table 2: Potential Smallholder Constraints

Constraints Faced by Smallholders	Inputs	Small Farm	Output Market
1. Technology / product development	Inappropriate or nonexistent tools/ machinery / technologies	Lack of access to technologies Lack of technical skills to produce to buyer specification	Lack of information on product demand
2. Market access	High transportation costs	Inability of smallholder to produce or supply to buyer specifications	Lack of market High transportation costs

		Lack of marketing techniques/methods	Lack of marketing organizations or brokers
3. Input supply	High prices Poor quality raw materials Lack of suppliers Existing suppliers have limited outreach High transportation costs for suppliers	High transportation costs for smallholders	
4. Finance	Lack of supplier credit Lack of access to commercial funding No alternatives to traditional bank lending	Lack of access to commercial funding Inability to provide adequate collateral No alternatives to traditional bank lending	Lack of access to commercial funding No alternatives to traditional bank lending
5. Policy	Artificial price subsidies Lack of regulations	Import taxes that penalize local producers Lack of government contracting procedures that favor smallholders	Artificial price subsidies Lack of regulations
6. Management and organization	Poor organization of large suppliers Lack of communication and/or cooperation between different actors	Inability of smallholder producers to organize for economies of scale Lack of smallholder actors with training in specific areas (financial management, production skills, marketing)	Poor organization of large buyers
7. Infrastructure	Poor road, electricity, refrigeration facilities, etc.	Poor road, electricity, refrigeration facilities, etc.	Poor road, electricity, refrigeration facilities, etc.
8. Information	Lack of information on product demand Lack of information on financing, prices, etc.	Lack of information on product demand Lack of information on financing	Lack of information on potential markets

9. Large-firm competition		Larger firms have more knowledge, skills and information than smallholders	Larger firms able to produce at lower cost
10. Social, cultural and legal constraints		<p>Women or marginalized groups unable to access credit</p> <p>Women or marginalized groups unable to own land or other productive resources</p> <p>Women or marginalized groups unable to market product</p>	

Gender Analysis

What is Gender Analysis?

Gender analysis is a cultural and societal study, at the productive, household and community levels, of the:

- Different roles of women and men;
- Resources, activities and benefits women and men have access to and control over;
- Daily workloads of women and men;
- Practical and strategic needs, interests and priorities of women and men; and
- Capacity of institutions, the private sector and other organizations to program for gender equality in order to assess the role of the PRISM intervention in addressing these issues.

Why Use Gender Analysis?

To meet the goal of increased incomes for women and men smallholders, PRISM seeks to integrate gender analysis in project planning, implementation and monitoring. Information gathered through gender analysis can be used to identify objectives, constraints, and opportunities for integrating women into market systems development programming. This ensures that the intervention benefits women and respects cultural norms. The information can also be utilized to establish a baseline and gender indicators against which to monitor gender equality results achieved over time. Gender analysis and the resulting gender programming can:

- Promote equal access to and control over land and other productive resources.
- Enhance women's opportunities for employment and income.
- Increase women's control over discretionary income generated from project interventions.
- Increase skills training and capacity development opportunities for women.
- Improve access to and control over credit, training, and services for women entrepreneurs.
- Reduce women's workloads.
- Increase women's participation in decision- and policy-making in the private sector and participation in decision- and policy-making in the household.
- Strengthen the capacity of partner institutions, governments and civil society to promote, design and implement policies, programs and projects that reflect the needs, priorities and interests of women.

Guiding Questions for Gender Analysis

The following guiding questions are designed to assist in the process of gender analysis:

1. *Access (use), control (decision-making) and "ownership"* of the land and water, as well as other farm, business and household assets: Do women and men benefit equitably from the intervention? If not, could a different strategy in intervention distribute the benefits more equally? What are the benefits for each? What are the adverse effects and how could these be mitigated?
2. *Management* of the land and/or business: With the introduction of irrigation technologies and high-value crop production, how will decisions regarding crop location, number and size of productive plots be made and who will be involved in making these decisions? In the small- to medium-input enterprises, how will decisions be made regarding which product to carry, pricing, etc and who will be involved in making these decisions?
3. Provision of *labor* on the farm and/or business: What is the workload of women and men in food production and input/output marketing? Will the introduction of smallholder irrigation and high-value crops increase the workload (time spent in irrigation, caring for, harvesting and marketing crops) for either women or men?
4. Rain-fed and irrigated *planting decisions* in relation to food security crops and cash crops: What is the involvement of women and men in deciding which crops to irrigate and which to grow as rain-fed?

- Are particular crops considered women's crops or men's crops? How will the intervention affect the production of food security and cash crops?
5. Access and participation in *training* in relation to farm management/production and business management: How can training and site visits ensure equitable participation by both men and women? What are the constraints to ensure equitable participation and how training mitigate these constraints?
 6. Access to *credit* to purchase inputs such as irrigation technologies, seeds, fertilizer: Who requests credit and who will use the credit for economic activity? How can the constraints be mitigated to ensure equitable access to credit?
 7. *Marketing* of cash crops: Who markets cash crops? How and where is each type of crop marketed? Who receives the cash income received through the marketing of the crops?
 8. *Family cash income* from farming and business: Who makes the decision in relation to family expenditure? What are the expenditure priorities of women? Of men? How do they view each others' priorities?
 9. Responsibility for *care and maintenance of the family* (including the ill) and the home: Who carries the primary responsibility for the maintenance and care of the family and household? When illness strikes, who provides primary care for the sick? Will the planned intervention put an additional strain on family/household care and management? Who attends and assists in the preparation of funerals?
 10. *Participation at the community level* through membership and decision-making roles: Who is involved in organizations at the community level and what is the level of involvement? What decision-making roles are held by men and women at the community level?
 11. *Priorities, opportunities, constraints (problems) and solutions*: What are the priorities for women and men and what are the opportunities and constraints in running their farm or enterprise? How do they mitigate the problems encountered and what solutions could they identify? What are their views on the priorities, opportunities and constraints of the opposite gender?
 12. *Attitudes* of staff and service providers on gender issues: What level of comfort is there in the organization, internally, across gender lines? Is affirmative action implemented in the hiring of staff to work towards greater equity in the staff composition? What training is provided to staff and service providers to ensure healthy gender relations and a greater comfort level with beneficiaries of the opposite gender?

Gender Analysis at the Farm Level

The following suggestions may assist in conducting gender analysis at the farm level:

1. Using a relatively informal format in the interview process provides the opportunity to be more personable in the process and to be dynamic and responsive to the information being provided by the person being interviewed.
2. The collection of information should be done in a participatory process using easily understood methods, which are relational and considerate of the respondent's responsibilities. The interview process needs to be responsive to the workloads and commitments of the smallholders, particularly women. To glean information required to complete a comprehensive gender analysis using participatory approaches requires a significant amount of time, and although a participatory process is the most effective and valued method of gathering information, the interviewer should be sensitive to other responsibilities of the person being interviewed. In most situations this will require a number of visits with the smallholder before the information is gathered.
3. To ensure women's participation, address constraints to their participation (e.g. timing meetings so that they are convenient, providing childcare, holding meetings within a home, etc.).

Assessing Water and the Potential for Irrigation Technologies

This section provides general guidance in understanding the water situation of smallholders and in understanding whether an intervention involving appropriate water technologies could be beneficial to smallholders. Understanding this situation can help to determine a) whether or not to proceed with an irrigation intervention; b) the type of technology to be promoted; and c) the type and level of involvement in the intervention.

Some minimum factors to consider in the process of assessing the potential for irrigation technologies are:

1. Labor rates;
2. Size of farms and size of smallholder plots;
3. Market demand for grains, vegetables and cash crops;
4. Farmer's level of experience with irrigation;
5. Conditions of major river deltas;
6. Climate, including rainfall patterns, length of growing season(s) and dry season(s);
7. Status of water as a market or commodity.

The following questions can assist planners in understanding smallholders' water situation and potential opportunities for an intervention based on improved water technologies.

1. *Water Availability*

- a. Average depth of groundwater
- b. Annual rainfall, frequency, and deviations. What are the weather patterns and nature of the seasons? Is there a dry season? If so, for how many months?
- c. Percentage of area with "good access" to ground water
- d. Quality of water for agricultural purposes
- e. Rainfall accumulation and dispersion
- f. Percentage of year with adequate ground water
- g. Percentage/number of farmers with year-round access to surface water
- h. Percentage of area that would need access to ground water at least 33 percent of the year
- i. Percentage of year that surface water is accessible to at least 50 percent of farmers
- j. What is the depth and sustainable draw-down capacity of aquifers throughout the country and per region? Gather any available country and/or regional hydro-geological maps.
- k. How many square miles of land are located where the aquifer is less than 25 feet?
- l. Water replenishment rates
- m. Out of the irrigable land, what is the percentage of the rain-fed sector?
- n. To what extent is limitation in availability of water a key limitation to small farmer crop volume?
- o. In each key geographic region, is water use greater than replenishment? Are wells drying up, with a strong trend to go to deeper aquifers for water source?

2. *Cost of Water for Smallholders*

- a. Cost of water to small farmers
- b. Average cost of digging wells in the area
- c. Is water free, subsidized, or made available at a fair market price to small farmers?

3. *Smallholder Use of Water*

- a. Current irrigation practices and current water conservation techniques

- b. Where do smallholders currently obtain water (river diversions, pumping from lakes, household wells, community wells, etc.)?
 - c. What is the current role of water in production of crops for markets, subsistence crops, water for household needs, community uses of water, etc.?
 - d. What is the impact of water availability on the poor?
 - e. What is the role of irrigation in primary cropping patterns?
 - f. What is the role of irrigation in increasing yields of key subsistence crops? What are the current water conservation techniques?
4. *Regulations Influencing Water* Are there laws or policies at the national, regional, or international level that impact water availability, use, and quality? Are there restrictions on irrigation from ground or surface water sources?
5. *Water Technologies*
- a. What are the current pumping and irrigation technologies available (mechanical, animal and human powered)? What are the current drilling technologies and their costs? What are the advantages and disadvantages to each?
 - b. What are the potential opportunities for making more water available (treadle pumps, shared community pumps, diversions) and/or for making more efficient use of the available water (storage systems, drip irrigation)? Is market research information available on the small-scale irrigation needs of small farmers?
 - c. Do farmers have experience growing crops under irrigation?
 - d. What is the practical experience of organizations involved in the construction of tube-wells/bore-holes?
 - e. What is the potential economic impact of the irrigation technology on the small farmer?
 - f. What is the availability of credit for the technology?
 - g. What is the quality of existing technical follow-up and maintenance, and training of farmers for correct operation and maintenance of the irrigation technology?
 - h. Are there subsidies for the technology?
 - i. Is there a well driller system available to install small-scale irrigation pumps? If not, can it be developed? How?
 - j. Estimating demand for low-cost irrigation technologies:
 - Numbers of small farmers and acreage in the country already growing crops suitable for irrigation;
 - Breakdown of farm size and the proportion of farms under five acres in the country that are suitable for irrigation;
 - k. Manufacturing:
 - Are there manufacturers available for the production of the technologies? If not, can this be developed? How?
 - What is the current capacity of the private sector to manufacture irrigation and small-scale irrigation technologies?
 - What are the key raw materials available in-country? What are their costs?
 - What is the minimum project sales volume required to motivate entry of producers in the marketplace?
 - l. Irrigation technology sales:
 - What is the country-wide gross sales of irrigation equipment? What is the breakdown of sales by region?
 - What is the demand for different types of irrigation equipment?
 - What is the estimate of price elasticity?
 - What are the leading local private sector firms and approximate annual sales volumes?

- What is the approximate sales volume of importers of irrigation equipment?
- What is the potential interest of existing private sector enterprises in producing and marketing low-cost irrigation technologies?
- What is the current marketing and distribution structure for irrigation technology?
- What are the current profit margins expected by manufacturers, dealers, distributors and installation technicians?
- Is there a potential sales and dealer network available for the selling of the technology? If not, can it be developed? How?
- What are the currently used marketing and promotional strategies and media?

Comparing, Ranking and Selecting Promising Opportunities

There are many methods to compare and select promising opportunities. These methods include:

1. Define and refine issues, priorities and questions. Evaluate opportunities through a process of assessment and discussion. Worksheet 1, below, “Evaluating Subsector Dynamics and Potential Interventions” can be used to evaluate different options.
2. Map areas that satisfy selected criteria. Overlay maps to see where all selected criteria overlap.
3. Utilize crop budgets to understand better a smallholders’ net return to land, water and labor and to estimate income that smallholders will earn in different circumstances. The crop budgets in Tables 3 and 4 below allow planners to compare yields, inputs required and expected income for four different types of farmers: relatively inexperienced smallholder farmers; very experienced smallholder farmers; experienced smallholder farmers using supplemental irrigation; and experienced smallholder farmers using winter irrigation.
4. Compare and rank opportunities by determining the relative importance of each selected criterion and then determining how well each area satisfies that factor. Two methods to accomplish this are described below: “Attractiveness Matrix” and “Weighted Ranking Methodology”. The Attractiveness Matrix compares options when there are only two important selection criteria. Where there are more than two selection criteria, the Weighted Ranking method should be used.

Worksheet 1 -- Evaluating Subsector Dynamics and Potential Interventions

	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
a. What channels are growing most rapidly?	_____	_____	_____	_____	_____
b. What driving forces (+) and constraints (-) are responsible?					
• market demand	_____	_____	_____	_____	_____
• technological change	_____	_____	_____	_____	_____
• input supply	_____	_____	_____	_____	_____
• profitability	_____	_____	_____	_____	_____
• large firm behavior	_____	_____	_____	_____	_____
• barriers to entry	_____	_____	_____	_____	_____
• policies	_____	_____	_____	_____	_____
c. Where can smallholders most effectively compete?	_____	_____	_____	_____	_____
d. What is required to enable this transition?	_____	_____	_____	_____	_____
e. Who can supply this service most cost effectively?	_____	_____	_____	_____	_____

Crop Budgets

Crop budgets are tools that can be used to understand better a smallholders' net return to land, water and labor. Crop budgets allow planners to estimate the amount of income smallholders will earn in different circumstances. The crop budgets below allow planners to compare yields, inputs required and expected income for four different types of farmers: relatively inexperienced smallholder farmers; very experienced smallholder farmers; experienced smallholder farmers using supplemental irrigation; and experienced smallholder farmers using winter irrigation.

The crop budgets below were developed to better understand smallholder paprika production in Zambia. These crop budget tables are for a one-hectare field of paprika grown during different crop windows and with different levels of farming expertise and inputs. These examples can be modified for other places and for different crops. In addition, these crop budgets can be scaled to any smallholder plot size. For example, to use the tables below for a quarter-hectare plot of land, divide the numbers by four. (Note that it will be necessary to make additional adjustments to price capital costs of the dug well and treadle pump, which can supply water for up to one hectare, but would still be needed for a quarter-hectare plot).

Data used in the crop budget tables below was collected in March 2004 in Zambia. They are modified from budgets provided by Cheetah, a Zambian paprika buyer and exporter. The crop budgets below assume that nurseries are used and the paprika seedlings are transplanted after 4 to 6 weeks for all cases. The depths of the irrigation applied water are based on an assumed crop cover of 80 percent and irrigation application efficiency 90 percent for agro-climatic Region II. It is assumed that the plants will be in the nursery for the first month of growth, so no field irrigation will be required during that time period.

The columns in the tables below refer to:

- The "Typical Smallholder" columns represent the yields and production inputs under relatively inexperienced smallholder management conditions.
- The "Optimum Rain-fed" columns represent the yields and production inputs under very experienced smallholder management conditions.
- The "Supplemental Irrigation" columns represent the yields and production inputs under very experienced smallholder management conditions using winter supplemental irrigation. For this column, the *IDEeal Drip* systems will provide water if the rainy season is delayed, there are dry spells during the rainy season, and for post rainy season irrigation through May. The total irrigation water requirement is computed from data using the CIR for Paprika Option # 3 as follows:

$$\text{Irrigation Requirement} = 0.8(526 - (62 + 35) - 80)/0.9 = 310\text{mm}$$

- The "Winter Irrigation" columns represent the yields and production inputs under very experienced smallholder management conditions with the transplants set out in April and irrigated using an *IDEeal Drip* system from April through October. The total irrigation water requirement is computed from data using the CIR for Paprika Option # 2 as follows:

$$\text{Irrigation Requirement} = 0.8(909 - 29)/0.9 = 782\text{mm}$$

Chemical inputs for "Winter Irrigation" production were reduced by half (as compared to the inputs for "Supplemental Irrigation" production) because fewer pest and disease problems are experienced during the dry season.

Calculating Financial Returns to Land and Water

Crop budget Tables 3 and 4, below, provide financial returns to family land and labor water for smallholder paprika production. In this analysis, it was assumed that the net return to land and labor would be allocated to labor. This assumes that there is excess land available and - where shallow

groundwater or surface water is available - it is also in excess. This would not be an accurate way to proceed where land and water are in short supply. But it would be valid for comparing returns to family labor for other crops under any circumstances.

The returns to smallholder family land and labor in both Tables 3 and 4 are the same for both the “Typical Smallholder” and “Optimum Rain-fed” production. However, the returns to labor are considerably higher as progress is made from typical production inputs and skill at growing paprika to the more advanced capabilities and greater cash inputs represented by the optimum rain-fed possibilities, i.e. \$1.37 vs. \$3.56 per person day. But the cash inputs and thus the risks are much greater, i.e. \$254 for the “Typical Smallholder” production vs. \$634 for a smallholder who has learned to optimize production under rain-fed conditions.

Tables 3 and 4 show the returns to smallholders who are experienced at growing rain-fed paprika and elect to install *IDEal Drip* systems. Table 3 is for the first year, during which it is assumed that the well, mainline and drip system are paid for out of the first year’s crop sales. It is interesting to note that the returns in the first year are large enough to pay for these capital costs and still have enough money remaining to provide the family workers with a reasonable return on their labor inputs (i.e. \$1.53 or \$2.30 per person day). The cash inputs are much higher than for optimum rain-fed conditions, i.e. \$634 vs. \$2,546 or \$2,387; however, the risks are considerably smaller because of the assurance of having adequate water regardless of the rainfall pattern.

Table 4 shows the returns for the 2nd through 4th years, based on the assumption that the irrigation system will have a life of at least four years. During this period, smallholders with *IDEal Drip* irrigation systems make considerably higher returns than they would have made without irrigation. Their net return to land and labor is increased from \$719 to \$2,080 or \$3,043 per hectare. Thus, even a two lima field of irrigated paprika will raise a farm family’s income to above the poverty level.

Table 3. Paprika Crop Budgets for Smallholders

Based on a 1.0-hectar field, in US \$, for the 1st crop season, during which the irrigation system is completely paid for

F.O.T (Delivered Lusaka)	Units	Typical Smallholder Nov -- April Period		Optimum Rain-fed Nov - April Period		Supplemental Irrigation Nov - May Period		Winter Irrigation April - Oct Period		
Yield (kg/ha)			800.00		1,600.00		3,200.00		4,000.00	
Yield of Paprika skin	kg/ha		576.00		1,152.00		2,304.00		2,880.00	
Yield of Seed	kg/ha		224.00		448.00		896.00		1,120.00	
Price Paprika (300 ASTA)	\$/kg		-		-		1.35		1.35	
Price Paprika (275 ASTA)	\$/kg		1.10		1.13		0.00		0.00	
Price Seed (28% seed)	\$/kg		0.12		0.12		0.12		0.12	
Revenue Paprika	\$		633.60		1,298.88		3,110.40		3,888.00	
Revenue Seed	\$		26.88		53.76		107.52		134.40	
Total Revenue	\$		660.48		1,352.64		3,217.92		4,022.40	
Direct input costs	\$		406.27		633.81		2,545.83		2,387.04	
Return to Land and Labor	\$		254.21		718.83		672.09		1,635.36	
Labor - Person-Day (pd)										
Nursery & Cropping	pd		100.0	100.00	100.0	100.00	160.0	160.00	180.0	180.00
Treadle Pumping (mm/crop)	pd						310.0	155.00	782.0	391.00
Harvest & Handling	pd		85.0	85.00	85.0	85.00	100.0	100.00	112.0	112.00
Management										
Management	pd				2.0	2.00	3.0	3.00	3.0	3.00
Supervision	pd				15.0	15.00	20.0	20.00	25.0	25.00
Total Family Labor (pd)	pd		185.00		202.00		438.00		711.00	
Return per Day of Labor	\$/day		1.37		3.56		1.53		2.30	
Return per Day of							1.77		3.77	

Family Labor with Hired Pumping @ \$1.10/pd									
Item	Price \$	quantity	costs	quantity	costs	quantity	costs	quantity	costs
Seed (kg/ha)	35.00	1.0	35.00	1.0	35.00	1.0	35.00	1.0	35.00
Fertilizers									
Compound D (kg/ha)	0.30	350.0	105.00	400.0	120.00	450.0	135.00	450.0	135.00
Urea (kg/ha)	0.30	150.0	45.00	150.0	45.00	150.0	45.00	150.0	45.00
AN (kg/ha)	0.30	-				150.0	45.00	150.0	45.00
Potassium Nitrate (kg/ha)	0.70	-		-		150.0	105.00	150.0	105.00
Potassium Sulphate (kg/ha)	0.45			150.0	67.50	200.0	90.00	200.0	90.00
Potassium Chloride (kg/ha)	0.33	100.0	33.00						
Trace elements (kg/ha)	3.80	-		2.0	7.60	6.0	22.80	6.0	22.80
Chemicals									
Methyl Bromide (tin)	4.00	-				10.0	40.00	5.0	20.00
Lasso (lt/ha)	14.00	-		-		2.0	28.00	1.0	14.00
Ronstar (lt/ha)	19.60	-		-		2.0	39.20	1.0	19.60
Karate (lt/ha)	30.00	0.5	15.00	0.6	18.00	0.6	18.00	0.3	9.00
Lannate (kg/ha)	10.00	-		0.8	8.00	1.2	12.00	0.6	6.00
Methamidophos (lt/ha)	8.00	-		-		2.0	16.00	1.0	8.00
Confidor (1 application) (lt/ha)	100.00	-		-		0.6	60.00	0.3	30.00
Copper oxychloride (kg/ha)	2.80	6.0	16.80	10.0	28.00			-	
Copper hydroxide (kg/ha)	5.25	-		-		8.0	42.00	4.0	21.00
Dithane M45 (kg/ha)	4.70	4.0	18.80	20.0	94.00	4.0	18.80	2.0	9.40
Sulphur (Wettable) (kg/ha)	2.00	-		3.5	7.00	7.5	15.00	3.8	7.50

Benomyl (kg/ha)	12.50	-	-	0.7	8.75	0.4	4.38
Machinery							
Treadle Pump	100.00	-	0.00	-	0.00	1.0	100.00
Irrigation							
Well	100.00	-	0.00	-	0.00	1.0	100.00
Mainline Pipe	100.00	-	0.00	-	0.00	1.0	100.00
Drip System							
Depreciation (\$/ha)	800.00	-	0.00	-	0.00	1.0	800.00
Drying							
Dry racks (50 m ² /ha)	30.00	0.8	24.00	0.8	24.00	1.0	30.00
Packing							
Hessian (3 m ² /100kg papr.) (bales can be re-used 4 times)	0.92	-	0.00	12.0	11.04	24.0	22.08
Twine (per roll)	9.70		0.00	0.3	2.43	1.0	9.70
90 kg polypropylene bags	0.40	20.0	8.00	-		-	
Transport							
Cost \$ / tons /100 km	12.00	1.4	16.80	2.3	27.60	4.3	51.60
Interest 28% of variable costs		-	88.87	0.28	138.65	0.3	556.90
Total costs			406.27		633.81		2,545.83
							2,387.04

Notes regarding Table 3:

- Pumping labor based on irrigation water requirements for agro-ecological Region II, 90 percent irrigation efficiency, and 1/2 day of treadle pumping per 1.0mm water applied.
- Interest is computed as 4 percent/month for 7 months = 28 percent.
- Prices are in \$US and are indicative only.

Table 4. Paprika Crop Budgets for Smallholders Based on 1.0-hectar field (in US \$).
(For the 2nd through 4th years after the irrigation system has been paid for.)

F.O.T (Delivered Lusaka)	Units	Typical Smallholder Nov -- April Period		Optimum Rain-fed Nov - April Period		Supplemental Irrigation Nov - May Period		Winter Irrigation April - Oct Period	
		quantity	costs	quantity	costs	quantity	costs	quantity	costs
Yield (kg/ha)		800.00		1,600.00		3,200.00		4,000.00	
Yield of Paprika skin	kg/ha	576.00		1,152.00		2,304.00		2,880.00	
Yield of Seed	kg/ha	224.00		448.00		896.00		1,120.00	
Price Paprika (300 ASTA)	\$/kg	-		-		1.35		1.35	
Price Paprika (275 ASTA)	\$/kg	1.10		1.13		0.00		0.00	
Price Seed (28% seed)	\$/kg	0.12		0.12		0.12		0.12	
Revenue Paprika	\$	633.60		1,298.88		3,110.40		3,888.00	
Revenue Seed	\$	26.88		53.76		107.52		134.40	
Total Revenue	\$	660.48		1,352.64		3,217.92		4,022.40	
Direct input costs	\$	406.27		633.81		1,137.83		979.04	
Return to Land and Labor	\$	254.21		718.83		2,080.09		3,043.36	
Labor - Person-Day (pd)									
Nursery & Cropping	pd	100.0	100.00	100.0	100.00	160.0	160.00	180.0	180.00
Treadle Pumping (mm/crop)	pd					310.0	155.00	782.0	391.00
Harvest & Handling	pd	85.0	85.00	85.0	85.00	100.0	100.00	112.0	112.00
Management									
Management	pd			2.0	2.00	3.0	3.00	3.0	3.00
Supervision	pd			15.0	15.00	20.0	20.00	25.0	25.00
Total Family Labor (pd)	pd	185.00		202.00		438.00		711.00	
Return per Day of Labor	\$/day	1.37		3.56		4.75		4.28	
Return per Day of Family Labor with Hired Pumping @ \$1.10/pd						6.75		8.17	
Item	Price \$	quantity	costs	quantity	costs	quantity	costs	quantity	costs
Seed (kg/ha)	35.00	1.0	35.00	1.0	35.00	1.0	35.00	1.0	35.00
Fertilizers									
Compound D (kg/ha)	0.30	350.0	105.00	400.0	120.00	450.0	135.00	450.0	135.00
Urea (kg/ha)	0.30	150.0	45.00	150.0	45.00	150.0	45.00	150.0	45.00

AN (kg/ha)	0.30	-				150.0	45.00	150.0	45.00
Potassium Nitrate (kg/ha)	0.70	-			-	150.0	105.00	150.0	105.00
Potassium Sulphate (kg/ha)	0.45			150.0	67.50	200.0	90.00	200.0	90.00
Potassium Chloride (kg/ha)	0.33	100.0	33.00						
Trace elements (kg/ha)	3.80	-		2.0	7.60	6.0	22.80	6.0	22.80
Chemicals									
Methyl Bromide (tin)	4.00	-				10.0	40.00	5.0	20.00
Lasso (lt/ha)	14.00	-			-	2.0	28.00	1.0	14.00
Ronstar (lt/ha)	19.60	-			-	2.0	39.20	1.0	19.60
Karate (lt/ha)	30.00	0.5	15.00	0.6	18.00	0.6	18.00	0.3	9.00
Lannate (kg/ha)	10.00	-		0.8	8.00	1.2	12.00	0.6	6.00
Methamidophos (lt/ha)	8.00	-			-	2.0	16.00	1.0	8.00
Confidor (1 application) (lt/ha)	100.00	-			-	0.6	60.00	0.3	30.00
Copper oxychloride (kg/ha)	2.80	6.0	16.80	10.0	28.00			-	
Copper hydroxide (kg/ha)	5.25	-			-	8.0	42.00	4.0	21.00
Dithane M45 (kg/ha)	4.70	4.0	18.80	20.0	94.00	4.0	18.80	2.0	9.40
Sulphur (Wettable) (kg/ha)	2.00	-		3.5	7.00	7.5	15.00	3.8	7.50
Benomyl (kg/ha)	12.50	-			-	0.7	8.75	0.4	4.38
Machinery									
Treadle Pump	100.00	-	0.00		0.00	-	0.00	-	0.00
Irrigation									
Well	100.00	-	0.00		0.00	-	0.00	-	0.00
Mainline Pipe	100.00	-	0.00		0.00	-	0.00	-	0.00
Drip System Depreciation (\$/ha)	800.00	-	0.00		0.00	-	0.00	-	0.00
Drying									
Dry racks (50 m ² /ha)	30.00	0.8	24.00	0.8	24.00	1.0	30.00	1.0	30.00
Packing									
Hessian (3 m ² /100kg papr.) (bales can be re-used 4 times)	0.92	-	0.00	12.0	11.04	24.0	22.08	30.0	27.60
Twine (per roll)	9.70		0.00	0.3	2.43	1.0	9.70	2.0	19.40
90 kg polypropylene bags	0.40	20.0	8.00		-			-	
Transport									
Cost \$ / tons /100 km	12.00	1.4	16.80	2.3	27.60	4.3	51.60	5.1	61.20
Interest 28% of variable costs		-	88.87	0.28	138.65	0.3	248.90	0.28	214.17
Total costs			406.27		633.81		1,137.83		979.04

Notes regarding Table 4:

- Pumping labor based on irrigation water requirements for agro-ecological Region II, 90 percent irrigation efficiency, and 1/2 day of treadle pumping per 1.0mm water applied.
- Interest is computed as 4 percent / month for 7 months = 28 percent.
- Prices are in \$US and are indicative only.

Attractiveness Matrix

The methodology for the Attractiveness Matrix is:

1. Rank each potential option high, medium, or low in terms of how well the option meets Criteria 1.
2. Rank each potential option high, medium, or low in terms of how well it meets Criteria 2.
3. Plot each option within the Attractiveness Matrix, as shown below.

The options appearing in the upper right hand portion of the matrix are the “attractive” options. Those placed toward the lower left are considered “not attractive.” In the Illustrative Example provided below, green beans and dairy best satisfy the two selected criteria.

Attractiveness Matrix

Criteria 2	High		Attractive	
	Medium			
	Low	Not Attractive		
		Low	Medium	High

Criteria 1

Illustrative Example of Attractiveness Matrix

Criteria 2: Potential to Increase Smallholder Income	High		Handicrafts	Green beans Dairy
	Medium	Avocados Beef		Tourism
	Low		Poultry Building Wood furniture	
		Low	Medium	High

Criteria 1: Potential Market Demand

Weighted Ranking Methodology

The Weighted Ranking methodology provides a systematic way to compare options. It does not offer any “magic,” but facilitates the decision process by forcing assumptions to be clearly stated, allowing the incorporation of both qualitative and quantitative assessments, and revealing the sensitivity of the final outcome to the various assumptions and assessments made in the analysis. The example below uses hypothetical data to assess potential project areas.

1. Assess the Importance of Criteria

Selected criteria are assigned a weight, based on project staff assessment of the importance of that criterion. Weights are as follows:

Very Important = 5, Somewhat Important = 4, Neither Important nor Unimportant = 3
Unimportant = 2, Almost no Importance = 1, Completely Unimportant = 0

(Note that any criteria to which project staff assign a weight of “0” should be dropped since, by definition, it is completely unimportant.)

Example Weights:

1. Maximum annual depth of water table: 5
2. Average literacy rate: 1
3. Average time to get to nearest urban market: 3
4. Availability of transport connections to international export market: 0
5. Number of days/year when temperatures are below freezing: 3
6. Existing local facilities that offer microcredit to smallholders: 4
7. Percentage of households that earn their livelihood from agriculture: 5

2. Assess How Well Each Area Satisfies Each Criterion

For each criterion, assign a value to every candidate area according to how well that area satisfies the criterion. This value, or “score,” represents the extent to which each area offers project success, as defined by that criterion alone. Scores are assigned as follows:

Very Well = 5, Fairly Well = 4, OK = 3, Poorly = 2, Very Poorly = 1

Example Area Values for the Criterion: “Average time to get to nearest urban market”:

- 1 Area A (time = 1.5 hours): 3
- 2 Area B (time = 0.25 hours): 5
- 3 Area C (time = 1.8 hours): 3
- 4 Area D (time = 0.75 hours): 4

Note that project staff judge how well each area offers project success as defined by each criterion. In the above example, staff judged the time to access urban markets for each of the four areas and decided that Area B (0.25 hrs travel time) satisfies “access to urban markets” very well (score =5) and Area C (1.8 hr travel time) satisfies this criterion at an “OK” level (score =3).

3. Calculate Results for Each Criterion

Project staff calculate results for each criterion by multiplying the weight assigned to each criterion by the score for how well each area satisfies that criterion. In the example provided below, the criterion “Average time to get to nearest urban market” was assigned a weight of 3 (Neither important nor Unimportant). Area A, with a travel time of 1.8 hours, scored 3 (“OK”) for this criterion. To determine the results for Area A, the weight of 3 is multiplied by the score of 3, for a result of 9 for Area A.

- 1 Area A: $3 \times 3 = 9$
- 2 Area B: $3 \times 5 = 15$
- 3 Area C: $3 \times 3 = 9$
- 4 Area D: $3 \times 4 = 12$

The example below focuses on the criterion “Percentage of households that earn their livelihood from agriculture” (weight = 5). The scores for this criterion are the percentage of the population working in agriculture in the different areas. The result for each area is calculated by multiplying the weight for each criterion by the percentage of the population that fits that criterion.

Example calculation for “Percentage of households that earn their livelihood from agriculture” (weight = 5)

1. Area A (% = 85): $5 \times 4 = 20$
2. Area B (% = 20): $5 \times 1 = 5$
3. Area C (% = 95): $5 \times 5 = 25$
4. Area D (% = 65): $5 \times 3 = 15$

3. Calculate the Total Score for Each Area

In order to compare the different areas, results for each area from the above step are added together for a total score. In the example below, the Area A result for the criterion “Average time to get to nearest urban market” (Result = 9) is added to the Area A result for the criterion “Percentage of households that earn their livelihood from agriculture” (Result = 20), for a total score of 29 for Area A.

Example total scoring for each area:

- 1 Area A: $9 + 20 = 29$
- 2 Area B: $15 + 5 = 20$
- 3 Area C: $9 + 25 = 34$
- 4 Area D: $12 + 15 = 27$

4. Rank Areas and Review Results

Rank the areas highest to lowest according to Total Score calculated above. The higher the Total Score for an area is, the more preferable that area will be for a project intervention that satisfies the selected criteria.

Example ranking:

- 1 Area C: Total Score = 34 (highest rank)
- 2 Area A: Total Score = 29 (2nd ranking)
- 3 Area D: Total Score = 27 (3rd ranking)
- 4 Area B: Total score = 20 (4th ranking)

After completing these calculations, project staff review the rankings to assess whether the results seem reasonable. This “reality check” is useful to ensure that an arithmetic procedure does not produce unrealistic results. If this does occur, project staff should review the assignment of criteria weights and scores, and repeat the necessary steps of the procedure.

Table 5, below, includes the example data used in the above discussion and provides a sample worksheet that can be used to implement this procedure. This sample worksheet is limited to four criteria and four potential project areas, but it can be expanded as needed.

Table 5: Weighted Ranking Methodology - Example Data

Area	Criteria							
	Criterion 1: Average distance to nearest urban market (km)	Criterion 2: Average time to nearest urban market (hours)	Criterion 3: Average annual water table depth (meters)	Criterion 4: Percentage of households whose primary livelihood is agriculture	Criterion 5: Population (thousands)	Criterion 6: Extent of paved roads (km)	Criterion 7: Households currently using drip irrigation (%)	Criterion 8: Number of high value crops sold in local and urban markets
Area A	10	1.5	15	85	35	55	20	5
Area B	0.5	0.25	2.5	20	80	150	45	10
Area C	35	1.8	35	95	20	75	15	2
Area D	15	0.75	5	65	45	100	30	5

Table 6: Weighted Ranking Methodology - Suggested Worksheet

Area	Criterion 1 Weight	Area Score 1	Product: Criterion 1 x Area Score 1	Criterion 2 Weight	Area Score 2	Product: Criterion 2 x area Score 2	Criterion 3 Weight	Area Score 3	Product: Criterion 3 X area Score 3	Criterion 4 Weight	Area Score 4	Product: Criterion 4 X area Score 4	Sum of shaded columns (Total Score)
Area 1													
Area 2													
Area 3													
Area 4													

Ranking Order

- District 1: _____
- District 2: _____
- District 3: _____
- District 4: _____

Designing a PRISM Intervention

Designing an Intervention that Addresses Sub-sector Constraints

The intervention design should address constraints identified through the market analysis phase. The following process was outlined by IDE-India to develop interventions that address constraints (this process is detailed in the tables below):

1. List all identified constraints and identify the most critical constraints for smallholders.
2. Group the critical constraints into categories, such as input, on-farm, and output constraints.
3. Identify existing or probable providers of services that can address identified constraints. Service providers are enterprises that provide services to members of the input-production-output chain to

IDE Nepal Intervention Design

Due to the hilly terrain in Nepal, transportation of smallholder-grown produce is a major constraint. A highly successful IDE intervention was the establishment of commercial collection centers for smallholder produce. In addition, smallholders are trained in harvesting techniques that decrease travel spoilage.

facilitate management and expansion of their operations. Examples of service providers include: input suppliers; produce buyers; brokers/traders; exporters; transporters; associations; training organizations. When assessing smallholder market opportunities, it is important to identify current and/or potential services to address key constraints and improve the capacity of smallholders directly or through enterprises that serve smallholder needs.

4. Develop market mechanisms for needed products and services. Facilitating establishment or strengthening of commercial services to address sub-sector constraints rather than providing services

directly helps to ensure sustainable solutions to constraints; avoids market distortions; expands outreach through a number of providers; and generates in-depth analysis and knowledge of private sector services available. At times, however, particularly in very underdeveloped markets, it may be necessary to support a particular business development service provider or launch a new service or model to demonstrate its potential, but as the provider or service becomes viable, it is important to switch to the role of facilitator.

Group Critical Constraints and Identify Service Providers

The tables below present the most critical constraints identified by IDE-India at the input, on-farm and output levels. For each constraint, IDE identified services, providers of those services, recipients of the service and how the services would be paid.

Table 7: Services to Address Input Constraints

Critical Input Constraint	Service to Address Constraint	Service Provider	Recipient of Service	Payment for Service
Poor quality seeds	Quality seeds	Agri-input dealer	Farmer	Direct by farmer
Lack of quality saplings	Quality saplings	Nursery	Farmer	Direct by farmer
Poor quality fertilizer and pesticide and in amounts not	Appropriate quality and quantity fertilizer	Agri-input dealer	Farmer	Direct by farmer

useable by small farmers	and pesticide			
Lack of water control	Water tech system	Manufacturer	Distributor	Direct by distributor
	Water tech system	Distributor	Dealer	Direct by dealer
	Water tech system	Dealer	Farmer	Direct by farmer
	System installation	Installer/assembler	Farmer	Direct by farmer

Table 8: Services to Address On-Farm Constraints

Critical On-Farm Constraint	Service to Address Constraint	Service Provider	Recipient of Service	Payment for Service
	Agricultural Tech	Agri-input dealer	Farmer	Embedded
	Crop selection	Agri-input dealer	Farmer	Embedded
	Crop selection	K.V.K	Farmer	Free

Table 9: Services to Address Output Constraints

Critical Output Constraint	Service to Address Constraint	Service Provider	Recipient of Service	Payment for Service
Lack of market information	Market information	Internet kiosk	Farmer	Direct by farmer
	Market information	Agri-Watch	Farmer	Direct by farmer
	Market linkages	IDE	Farmer	Free
Lack of value addition to farmer products	Value addition training	Local experts	Farmer	Initially paid by IDE, later by farmer

Similarly, the table below summarizes examples of business services that address key constraints affecting smallholder market-oriented production.

Table 10: Examples of Business Services that Address Key Constraints

Type of Constraint	Business Service
1. Technology / product development	<ul style="list-style-type: none"> • Access to information on new technologies • Product research and development for new

	technology/product development <ul style="list-style-type: none"> • Access to vocational training • Access to machine and equipment rental services
2. Market Access	<ul style="list-style-type: none"> • Identification of new markets • Providing linkages to buyers • Provision of market research services • Access to export services • Access to information services
3. Input supply	<ul style="list-style-type: none"> • Grouping smallholders • Access to material inputs • Brokerage of linkages with suppliers
4. Finance	<ul style="list-style-type: none"> • Provide linkages with financial institutions • Training in procedures/requirements for accessing credit • Access to supplier credit
5. Policy	<ul style="list-style-type: none"> • Training in advocacy • Policy/advocating for improved regulatory environment • Access to policy studies
6. Management and organization	<ul style="list-style-type: none"> • Training in management and business skills • Access to development of business plans • Provision of accounting services • Developing management information systems

Assess Service Providers

In addition to identifying current and potential service providers, it is important to assess these services in order to understand demand for the services and feasibility of utilizing the services. Table 11, below, summarizes suggested information-gathering to assess business services and methods for collecting this information.

Table 11: Information Gathering on Business Services

<u>Information Needed to Assess Business Services</u>	<u>Suggested Methods to Collect Information</u>
<ul style="list-style-type: none"> • Existing providers • Market size and penetration • Frequency of use • Constraints and opportunities on the demand side (business service users) • Constraints and opportunities on the supply side (business service providers) • Awareness of the business service among potential users • Satisfaction with the business service among users • How costs are covered (fee for service or embedded) • Proposed providers to target for intervention 	<ul style="list-style-type: none"> • Focus groups • Surveys/questionnaires of business service users • Surveys/questionnaires of business service providers • Business plans or pilot testing to determine feasibility

After current and potential commercial services have been identified, these services can be compared and selected based on criteria such as:

- Number of smallholders or enterprises that will benefit
- Increase in income/efficiency/effectiveness of smallholders or enterprises
- Increase in smallholders' income
- Positive environmental/social impacts
- Cost-effectiveness of the intervention
- Chances of intervention resulting in establishment of sustainable business service(s)
- Capacity of existing facilitators to implement/manage the intervention
- Synergy of interventions among various business services
- Feasibility of intervention (time frame, resource availability, donor interest)

Develop Market Mechanisms that Address Constraints

**Intervention Design to Address Opportunities and Constraints
Sherpur, Bangladesh**

A market assessment conducted by IDE in Bangladesh highlighted high demand for vegetables, with significant potential to increase profits and reduce chemical fertilizer use. Constraints in the vegetable market included lack of knowledge, skills, and information on vegetable cultivation. To address this constraint, IDE implemented an intervention focused on capacity-building to improve vegetable production knowledge and skills. This intervention is described in detail in Appendix C.

General suggestions for developing a market-based intervention that addresses constraints limiting smallholder income generation include:

1. Promote competition, efficiency, and innovation through the intervention.
2. The intervention should be flexible and responsive to dynamic market opportunities and changes.
3. Develop linkages with other agents who can provide the required services to address constraints. For example, where there is a financial constraint that limits smallholders from purchasing needed inputs, a variety of financial institutions (e.g. credit unions, co-ops, commercial banks) may provide financial services to smallholders in the form of micro-finance, savings, credit, micro-insurance, and micro-leasing.
4. Target interventions at pre- and post-service delivery. Examples of pre-delivery activities include: development of service products, test marketing, capacity building, and raising awareness. An example of a post-delivery activity is gathering consumer feedback.
5. Improve sustainability by strengthening mechanisms that ensure long-term provision of unsubsidized services needed within the market system.
6. Develop an exit strategy linked to sustainability of the intervention's market development objectives and through which market development facilitators disappear as the market functions effectively.

To develop market mechanisms that address identified constraints, it is useful to add further details to Tables 7, 8, 9, and 10 above in relation to creating or improving each identified business service. For example, to address the "Input supply" constraint in Table 10, one potential business service listed is "grouping smallholders" in order to purchase supplies in bulk, analyze market demand and gain more favorable prices. The intervention design team can develop details on how to accomplish this, such as through providing advice on the formation of smallholder enterprise groups (e.g. trade group associations).

Tables 12 and 13, below, highlight intervention measures developed by IDE-Nepal and IDE-India to address specific constraints identified in the assessment phase of the project design. Figure 5 (following the tables) illustrates IDE-Vietnam's intervention design process to re-structure and develop service markets for the poor, including the objective, approach and key strategies in this process.

Table 12: IDE-Nepal Intervention Design to Address Market Constraints

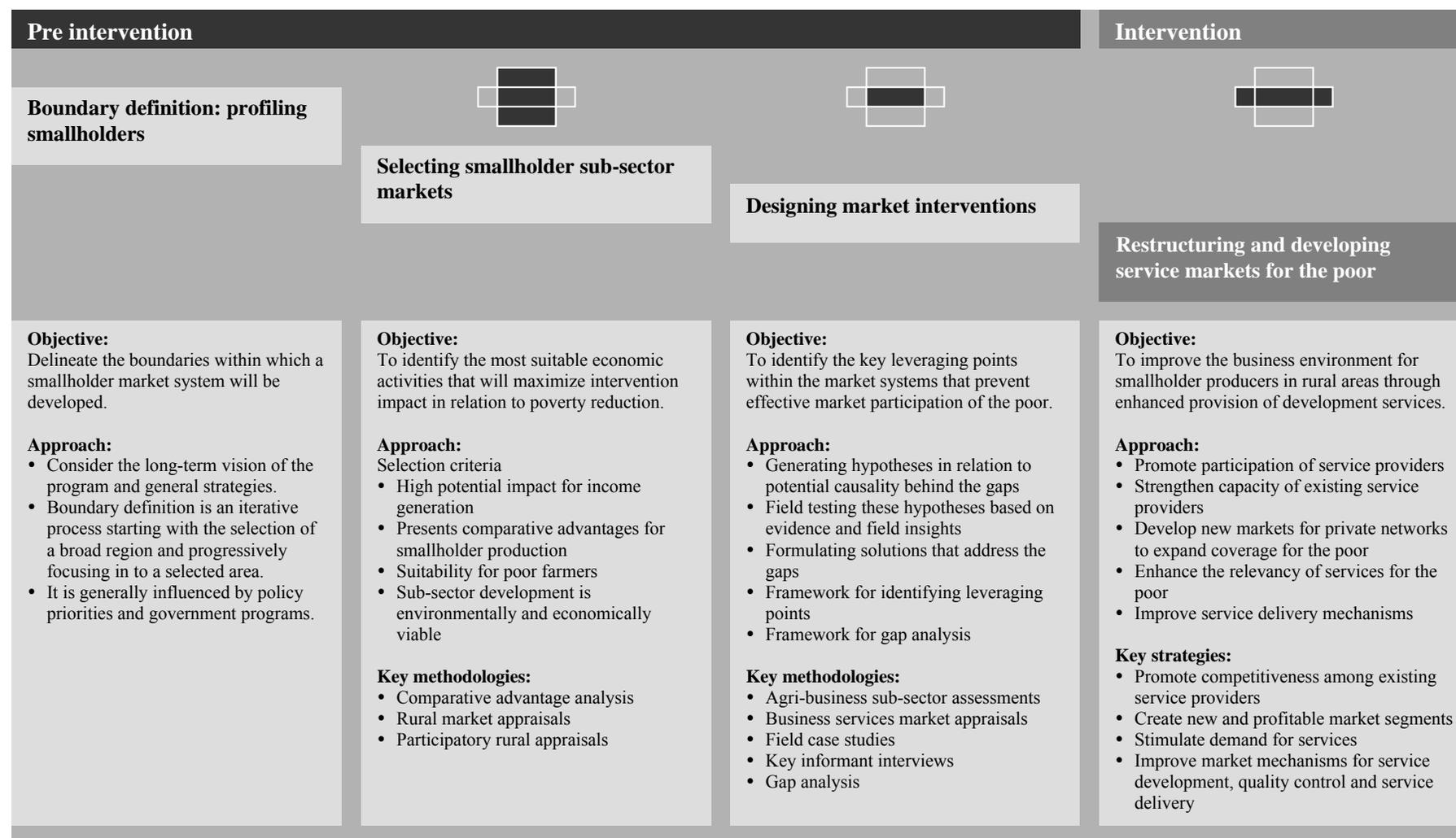
Constraint	Intervention
Weak supply	Capacity building of dealers Product development
Weak demand	Promotion of MIT
Few transactions	Workshop between suppliers and farmers

Table 13: IDE-India Intervention Design to Address Smallholder Constraints

	Constraints	Intervention
Input Constraints	<ul style="list-style-type: none"> • High input cost for fertilize, pesticide, etc. • No awareness or access to low-cost drop irrigation technology 	<ul style="list-style-type: none"> • Promote vermi-wash¹, vermi-compost, neem oil and cake • Promote drip irrigation
On-farm Constraints	<ul style="list-style-type: none"> • Lack of knowledge about appropriate agronomic practices • Lack of knowledge about alternative crops 	<ul style="list-style-type: none"> • Promote integrated pest management, organize farmer training by local experts • Exposure visits and interaction with entrepreneurial farmers • Promote input availability (seed, sapling) • Promote alternative crops
Output constraints	<ul style="list-style-type: none"> • Lack of price information in alternative markets • Heavy dependence on seasonal crops, which creates a dip in the market price 	<ul style="list-style-type: none"> • Promote ICT usage for price exploration • Promote off-season crops • Promote crop diversification for risk hedging • Promote bamboo, shisham for long-term security

¹ Vermicompost is a micro-nutrient plant solution that increases yield and plant resistance to disease; it made at the household level using locally available materials (earthen pots, brick pieces, sand, soil from an ant hill, compost, earth worms, leaves, and water).

Figure 5: Intervention Design Process to Improve Service Provision to the Poor



Coordination with Stakeholders in Intervention Design

It is highly useful to organize workshops, focus groups, interviews, etc. to identify potential interventions that improve the business services selected earlier in the intervention design process. The objectives of coordinating with stakeholders are to:

- Validate major sub-sector constraints and related business services within the targeted sub-sector;
- Validate business service assessment information, including supply and demand side constraints of targeted services;
- Discuss and review actual interventions needed to develop the targeted business services;
- Coordinate efforts of donors, government, and other stakeholders in order to avoid conflicting messages.

Designing an Intervention that Addresses Policy Constraints

Constraints to smallholder market-oriented production often include policy constraints. Suggestions for addressing policy constraints include working together with donors and governments to:

1. Create a facilitating policy framework;
2. Develop quality guidelines;
3. Reduce the risks and costs involved in sourcing from smallholders through policies;
4. Facilitate access to finance along the value chain and ease financing bottlenecks;
5. Create an enabling environment that enhances competitiveness within the sector (e.g. appropriate infrastructure development, research and development).

Designing an Intervention that Addresses Smallholder Risks

Farming in general and market-oriented production in particular entails risks for farmers, particularly if farmers invest in irrigation technologies and other inputs. Risks can be grouped in the following three categories:

1. Market risk
2. Technology risk
3. Production risk

In relation to these three types of risk, small-scale farmers often have experience managing production risks; market risks and technology risks are often more challenging for farmers to manage. To develop an intervention that addresses these risks, it is helpful to understand the different variables of each potential PRISM intervention and to quantify (e.g. through crop budget analysis – see the Crop Budget section above) how much money a farmer will spend, what her or his expected income will be, and what risks are involved for the smallholder. Below are recommendations developed by IDE-China to help to reduce risks to smallholders.

- a. Working with a proven market ensures that there is market demand for the smallholder product. For example, vegetables are often a good proven market, because most people eat vegetables. However, new or exotic vegetables may not be a proven market because consumers may not buy a new and different type of vegetable.
- b. Ensure that smallholders have a long-term cost advantage compared to competitors. Even for a proven market, smallholders may not make money if there is no cost advantage over larger farms.
- c. Smallholder production for a full-spectrum market may help to reduce risk. A full-spectrum market includes both less expensive products (e.g. vegetables for the local market) as well as more expensive products (e.g. vegetables for supermarkets and export markets). If smallholders produce only for the export market, they face higher risks. Production for a full-spectrum market provides flexibility and potential for differentiation.

Price Information for Farmers

Accessing accurate, timely information on crop prices is critical for farmers. In Nepal, the Chamber of Commerce provides daily crop price information. IDE links farmers to this information. IDE also builds farmers' capacity to utilize price information for improved bargaining power with buyers and to adjust their activities – including harvest and storage - in accordance with prices.

- d. It is important to have good knowledge about the selected crop in order to provide good technical support to smallholders. For example, risk of failure can be reduced with good market intelligence, obtained from industry experts.
- e. Use proven technology to reduce risks.
- f. Use information from local entrepreneurs regarding successful and failed ventures. Entrepreneurs are risk takers and therefore can provide much useful information about risks.
- g. Connect smallholders with outside sources of expert knowledge.
- h. Establish demonstration plots and work at first with innovators who are willing to take risks to demonstrate to farmers who are more risk-averse.

IDE-Cambodia utilizes a portfolio approach to reduce smallholder risk. This approach is based on smallholder production for several sub-sectors, balancing potential returns with length of time to achieve these return and risk involved. This approach is depicted in the table below.

Table 14: Portfolio Approach to Reduce Smallholder Risks

		Medium Potential Return	High Potential Return
Short Term	Low risk	<ul style="list-style-type: none"> • Improve staple crop production for food security 	
	Med Risk	<ul style="list-style-type: none"> • Improve productivity of existing income crops/products 	
Medium Term	Low risk	<ul style="list-style-type: none"> • Expand market for existing crops to new areas 	<ul style="list-style-type: none"> • Add value to existing crops through processing
	Med Risk	<ul style="list-style-type: none"> • Introduce new crop for local market 	<ul style="list-style-type: none"> • Introduce new crop for expanding market
Long Term	Low risk		<ul style="list-style-type: none"> • Tree crops for children's education (e.g., teak)
	Med Risk		<ul style="list-style-type: none"> • Long-term investment crops (e.g., coffee)

Tools for Partnership Development

Why Develop Partnerships for PRISM?

Developing partnerships is important in order to implement PRISM on a large scale to achieve the goal of widespread poverty alleviation. In some situations, it is necessary to involve other organizations/service providers to fulfill the many different roles of creating sustainable smallholder market systems. These roles may involve facilitation or direct provision (technology, finance, information, policy) at multiple levels (input, on-farm, output) to develop pro-poor smallholder markets. Partnerships also help to ensure that indigenous knowledge and experience are incorporated into project design, encourage local organizations to take ownership of the process, and build local capacity to apply the PRISM approach for more widespread poverty reduction.

The role of IDE in partnership development is the formation and maintenance of “platforms”, or consortiums, upon which participating organizations work together toward a common goal of sustainable market participation by the rural poor. Such platforms for collaboration and coordination generate synergy by combining the efforts of numerous players in a targeted fashion. Different partner types and different partner organizations may be brought into the PRISM process at different points of the project cycle and partners may participate to a greater or lesser extent in individual project formulation and implementation activities.

In Nepal, IDE concluded that a weakness of earlier government development programs was excluding the private sector. IDE-Nepal established partner networks that focused on sustainable market development through building the capacity of market actors - including smallholders and small enterprises - along the value chain. Organizations participating in the network included NGO, government, research, and private sector organizations. The networks focused on the following domains: agricultural technologies; social mobilization; institutional development; infrastructure (water source development and marketing structures development); and policy influence.

Identifying and Selecting Partners

Potential partners may include government, civil society, donors, and/or private enterprises. Selecting partners is largely dependent on local needs and capabilities. Careful selection of partners will ensure that the full range of identified constraints are adequately resolved to develop sustainable smallholder market systems, and that the process of smallholder market development will become self-sustaining over time. Partners may be selected based on a search of options against a specific set of expertise or experience required. Partners may also appear opportunistically in the context of a given initiative. Potential partners may also be identified through networking, workshops, or tender. The task is to judge whether the potential partners are suitable, will add value to the whole, and whether they bring new opportunities.

A simple process for identifying partners is to list the key aspects of identity, strategy, expertise, goals, capacity, financial security, etc. of each potential partner to judge whether there is an overlap or a complementary linkage. The partnership can then be built on features that bring the organizations together and processes can be developed to manage the characteristics that may drive the partnership apart.

Defining and Structuring the Partner Relationship

It is important to outline clearly what each partner brings to the partnership and to structure the partnership to ensure that this happens. Key issues regarding definition and structure of the partner relationship include:

- *Clear Purpose and Objectives.* It is important to understand the benefits that each partner brings into the partnership because attaining these benefits will be a key factor in sustaining the partnership relationship. The nature of the benefits varies according to the specific component of the PRISM process or production/market value chain that the initiative addresses.

- *Responsibilities and Tasks.* Identifying and writing responsibilities and tasks for each partner clarifies roles and responsibilities prior to project intervention. It is also important to institute monitoring and review processes to ensure that each partner fulfills these responsibilities and tasks, the partnership is moving in the right direction, barriers are overcome, etc. Procedures for clarifying roles, responsibilities and tasks may include informal, MoU, joint proposal, or sub-contractor.
- *Assets* of each partner.
- *Overlap and Complementarity.*
- *People.* Although a partnership is defined by the context of material and technical aspects - money, skills, information, technology, etc. - in reality, it will be a partnership between defined people in those organizations. At the early stages, key people need to be identified and processes instituted to enable productive and trusting relationships to be built. Development of internal communication and decision-making rules and procedures assists in managing the process of change in people in the partnership.
- *Space* for growth.
- *Structures.* Structures for decision-making.
- *Internal Communication Procedures.* It is important to establish procedures for the internal flow of information and communication between different key people and offices, following a defined structure and discipline.
- *Problem Solving Mechanisms.*
- *Capacity building* of partners.

Monitoring and Evaluation of PRISM Projects

Table 15: IDE Goal and Core Indicators presents core indicators to measure, aggregate, compare and demonstrate impacts of PRISM programs and to assess progress in achieving goals in relation to value chain development. This information can be collected through household surveys; farming system case studies to monitor households in relation to specific crops and farming practices to learn about the effectiveness and sustainability of the PRISM intervention; livelihood impact case studies to assess changes in intra-household relationships, household expenditures and well-being; studies on the enabling environment and support structures around value chain development to identify causal links and attribution of impact; natural resource impact assessments; focus group discussions with smallholders to understand primary stakeholder perspectives, changes in farming systems and perceptions of strengths and weaknesses; and customer satisfaction surveys to receive feedback on the use and appropriateness of technologies and services.

Table 16: IDE Country Program Objectives presents five objectives established to achieve the goals of PRISM. For each objective, there are suggested guideline indicators that can be adapted as relevant to the context and project intervention. Measuring progress in relation to these objectives will enable an assessment of the effectiveness, efficiency, relevance and impact of interventions and activities.

In both tables below, indicator-based information is complemented with PRISM learning questions and learning methods to generate a more complete picture of change processes and impacts on wellbeing and to advance PRISM learning for improved impact. Learning approaches include story harvesting techniques to collect, discuss and synthesize change processes and intervention methodologies within each country and throughout IDE; engaging researchers to study and document in detail specific issues of interest to IDE country programs; and PRISM seminars to exchange, systematize and document experiences implementing PRISM.

Table 15: IDE Goal and Core Indicators²

Goal	IDE Standard Indicators	IDE Standard Means of Verification	Required Data	PRISM Learning Questions and Information Sources
<p>XX rural families (a majority of whom live on less than \$1/day and all of whom live on less than \$2/day) that sustainably increase their net annual income by YY dollars as a result of IDE activities.</p> <p><i>[XX and YY to be specified for each country program]</i></p>	<p>Cumulative and year-on-year increase in the number of project customers, disaggregated by:</p> <ul style="list-style-type: none"> - Products/services purchased or adopted; - Length of time using the products/services; - Starting income level (<NPL, <1\$/person/day, or <\$2/person/day in PPP terms) <p>Median of the amount and rate (%) of net annual income changes of project beneficiaries, disaggregated by:</p> <ul style="list-style-type: none"> - Products/services purchased or adopted; - Length of time using the products/services; - Starting income level (<NPL, <1\$/person/day, or <\$2/person/day in PPP terms) <p>Total net farm HH income generated (absolute value</p>	<ol style="list-style-type: none"> 1. Register of customers/beneficiaries (to be used to select a representative sample for monitoring surveys) 2. Yearly monitoring surveys of 200 households per country 	<ol style="list-style-type: none"> a. Names of households purchasing/adopting products/services promoted by the project, with a HH identification number linked to GIS a. Household composition (# of males; # of females, age, level of education, marital status, ethnic/cultural/religious affiliation, access to land) b. Geographical location by village c. Net annual household income this agricultural year and indication whether this was bad, regular, good d. Net annual household income of preceding agricultural year and indication whether this was bad, regular, good e. Number of months/years of involvement in each type of product/service adopted f. List of products/services that can be adopted by HH (e.g. water technology; agricultural production technology; market access services; financial services), including products/services received from 	<p><u>Learning Questions:</u></p> <ul style="list-style-type: none"> - How do we facilitate poor rural families to sustainably increase their net income? - Does increased income result in significant sustainable livelihood improvements for smallholders? - Are specific conditions needed for the successful application of PRISM? - What adjustments are recommended to apply PRISM in other locations? <p><u>Sources of Information:</u></p> <ul style="list-style-type: none"> - Story harvesting of 'best practices' and/or 'key challenges' of poor rural families increasing net income, with sufficient detail to understand change

² The following will be calculated using data collected from Table 1:

- a. Financial Return on Investment, based on the net present value of household income changes and donor investment;
- b. Economic Return on Investment, incorporating economic multipliers to assess economic impacts, including the intended and unintended spin-off effects of the intervention in the local economy;
- c. Social Return on Investment, assigning weighted factors to the economic costs and benefits that reflect the social valuation of poverty reduction.

³ Total net farm HH income calculated as: Total Net Income ÷ Donor Investment. Donor investments are calculated according to project budget of IDE, co-investments by other donors are not included, if this information is not available.

Goal	IDE Standard Indicators	IDE Standard Means of Verification	Required Data	PRISM Learning Questions and Information Sources
	and per dollar of donor investment) ³	<p>3. Detailed Farming System Case Studies (25-50 households per country); interview after each crop season</p> <p>4. Quarterly focus group discussions with customers/beneficiaries to assess the importance and relevance of support interventions in their village/region</p> <p>5. Project budget</p> <p>6. Retailer records to assess the number of secondary adopters</p> <p>7. Annual progress reports - to include the actual value for project period to-date and the net present value of this annual income increase.</p> <p>8. Demographic statistics - comparisons with regional averages of poverty and population (GIS)</p> <p>9. Sub-sector studies: 2 in-depth qualitative descriptions of the dynamics in the institutional environment of the smallholder sector (in 2007 and 2010)</p>	<p>other NGOs and GOs</p> <p>a. More detailed information than in the survey</p> <p>a. Identify key factors in relation to adoption/non-adoption of technologies or market channels and the relevance of other NGO or GO support activities in this decision making</p> <p>a. Income statistics, poverty maps, demographic information</p> <p>a. Tendencies/dynamics in the sector/value chains (i.e. business practices, role of associations, governmental regulation, market dynamics, politics context, etc.)</p>	<p>processes</p> <p>- Expenditure analysis in a sample of participants on uses of income and impact on their lives (MonQI)</p>

Goal	IDE Standard Indicators	IDE Standard Means of Verification	Required Data	PRISM Learning Questions and Information Sources
		10. Inter-institutional coordination reports: quarterly reports on activities of other NGOs and GOs in the project area with a checklist to assess the level of support and expected impact of their interventions	a. Products/services provided by other supporting organizations: government, NGO, private sector, banks, BDS providers, etc.	
IDE Cross-Cutting Goals				
Market sustainability	Body of evidence on market sustainability	<p>1. Value chain analysis for products/technology introduced by IDE, to include:</p> <ul style="list-style-type: none"> - Profit margin of each supply chain operator - Level of subsidy from IDE or others - Trend in sale of products/services (expanding, stable, declining) - Evidence of new actors entering the market independent of project activities - Evidence of innovation, adaptation, and diversification of products/services independent of project activities <p>2. Quarterly focus group discussions with communities to discuss and assess smallholders' and service providers' perceptions of changes over time in relation to country-specific key enabling environment parameters</p>	<p>a. Prices and (attributable) costs for each chain operator in the supply chains of technologies</p> <p>b. Level of subsidy of (attributable) costs by IDE or other support organization (NGO and GO)</p>	<p><u>Learning Questions:</u></p> <ul style="list-style-type: none"> - How do we facilitate change in the enabling environment (e.g. markets, policies) to improve the lives of smallholders? - What were the key challenges and lessons learned in the process of improving the enabling environment? <p><u>Sources of Information:</u></p> <p>Story harvesting of 'best practice' and 'key challenges' in relation to market sustainability and enabling environment.</p>
Natural resource	Assessment of potential	1. Qualitative or semi-quantitative assessment of natural resource	a. High resolution GIS overlays with current and future water availability,	<u>Learning Questions:</u>

Goal	IDE Standard Indicators	IDE Standard Means of Verification	Required Data	PRISM Learning Questions and Information Sources
sustainability	natural resource impacts Changes in specific environmental parameters over the project period (e.g., groundwater levels)	impacts conducted for each project area. Factors may include: - Water quantity: total water use relative to total resource availability - Soil and water quality: changes in salinity - Land use: change in irrigated area, slash-and-burn area, erosion	soil quality, slopes	<ul style="list-style-type: none"> - How do we define and involve stakeholders in managing natural resources sustainably (with particular attention to women and disadvantaged groups)? - What were the key challenges and lessons learned in the process of improving natural resource sustainability? <p><u>Sources of Information:</u> Systematically gathered detailed case stories of 'best practice' and 'significant change' in relation to NRM practices</p>
		2. Farming System Case-Studies (MonQi) to monitor changes in efficiency in natural resource use of traditional and IDE-promoted farming systems (irrigation, horticulture, crop varieties, etc.)	a. Detailed information on cropping patterns, rotations, livestock-agriculture linkages, input use, etc. to assess nutrient balance and water efficiency	
		3. Quarterly focus group discussions with communities to discuss and assess smallholders' perceptions of changes over time in relation to country-specific key NRM parameters, using LAST-type method		
Gender/Social Impact	Percentage of customers from marginalized groups ⁴ Qualitative impact on marginalized households and/or individuals within households	1. Livelihood Impact Case Studies for detailed assessment of changes in intra-household relationships, household expenditures and wellbeing	a. Changes in workloads, access to assets, control over benefits, use of additional income, household well-being	
		2. Gender disaggregated data on customers, training participants and technology/service adopters	a. Unique ID for each household with customer data disaggregated by gender	

Note: All data to be disaggregated by gender where feasible.

⁴ Type of "marginal group" to be specified for each project (e.g., women, ethnic minorities, low castes, disabled).

Table 16: IDE Country Program Objectives and Guideline Indicators

IDE-Wide Objectives	Guideline Indicators	Suggested Means of Verification	Suggested Data Needs	PRISM Learning Questions and Information Sources
<p>Farmers have increased/improved interaction with output markets</p>	<ul style="list-style-type: none"> • Farmers' net margin and sales volumes • Percentage of retail price received by the farmer • Percentage of net-income derived from crop sales • Ability among farmers to identify and respond to market opportunities • Sales volume to the specific output markets (through the value chains) • Number and organizational strength of marketing networks • Number of smallholders/micro-small entrepreneurs (MSEs) linked with marketing networks • Farmers' risk management strategies to respond to market dynamics (prices, quality requirements, contract compliance, etc.) 	<p>1. Subsector analysis - farm sales into agricultural value chains (product flow)</p>	<p>a. Gross sales volume in the chain/output market b. Profit margins for smallholders in producing and marketing their crops in the agricultural value chain c. # of marketing committees</p>	<p><u>Learning Questions:</u> What were the key challenges and lessons learned in increasing and improving farmer interaction with output markets? What were the main challenges and key lessons learned in the process of improving farmer production practices?</p> <p><u>Sources of Information:</u></p> <ul style="list-style-type: none"> - Deduct lessons learned from an analysis of systematically gathered detailed case stories of 'best practice' and 'significant change stories' in relation to farmer-market interaction. - Discuss country experiences in IDE PRISM seminars - Participate in workshops etc for feedback from other organizations and researchers
		<p>2. Monitoring survey – income impacts on household level</p>	<p>a. Percent of net-income derived from sales of production to markets b. Knowledge of the market dynamics in relevant agricultural value chains</p>	
		<p>3. Annual focus group discussions with: -Chain operators to discuss SWOT and assess changes in chain performance and quality control -Smallholders to assess their perception of change in relation to key parameters of farmer-market interaction and related risks/opportunities, differentiating among smallholders (e.g. female-headed, caste.)</p>	<p>a. Stakeholder relationships and transaction costs, constraints and opportunities b. Transaction costs and profit margins</p>	
		<p>4. Organizational assessment to assess marketing committees / producer organizations</p>	<p>a. Organizational rights and obligations of members / non-members b. Income generation capacity to cover (recurrent) operational costs c. Dependency of subsidies d. Financial transparency and accountability</p>	

IDE-Wide Objectives	Guideline Indicators	Suggested Means of Verification	Suggested Data Needs	PRISM Learning Questions and Information Sources
Improved on-farm production practices	<ul style="list-style-type: none"> • Productivity per unit land⁵ • Productivity per unit labor⁵ (i.e. implicit rural wage rate) • Change in knowledge/capacity in production practices • Change in area for commercial production using improved production practices • Abandonment rate of improved production practices • Farmers' risk management strategies to respond to production condition dynamics (plagues, weather) 	<ol style="list-style-type: none"> 1. Baseline and bi-annual monitoring survey to monitor impacts on household level 2. Farming system case-studies (MonQi) <ul style="list-style-type: none"> - Monitor net-income impacts of changes in farming systems - Monitor changes in risk reduction comparing traditional and IDE-promoted farming systems (irrigation, horticulture, crop varieties, etc.) 3. Annual focus group discussions with smallholders to assess their perception of change in relation to key parameters of production practices 	<ol style="list-style-type: none"> a. Productivity measured as net value which results from adoption of particular technology or input. (urea briquettes, solarization, quality seeds, IPM etc) b. # of farmers adopting specific technologies and improved use of inputs <ol style="list-style-type: none"> a. Detailed information on cropping patterns, rotations, livestock-agriculture linkages, input use, etc. to assess nutrient balance and water efficiency 	<p><u>Learning Questions:</u></p> <p>What were the main challenges and key lessons learned in the process of improving farmer production practices?</p> <p>What process is recommended to ensure that the measures undertaken address the needs and constraints of women and other disadvantaged community members?</p> <p><u>Sources of Information:</u></p> <ul style="list-style-type: none"> - Deduct lessons learned from an analysis of systematically gathered detailed case stories of 'best practice' and 'significant change stories' in relation to farmer-market interaction. - Discuss country experiences in PRISM seminars - Participate in workshops, etc for feedback form other organizations and researchers
Increased/improved use of irrigation by small holders.	<ul style="list-style-type: none"> • Change in irrigated area⁶ using specific irrigation technologies • Abandonment rate of specific irrigation technologies • Change in productivity per unit water • Change in knowledge / capacity in irrigation practice and efficient use of water resources 	<ol style="list-style-type: none"> 1. Sales records of producers, distributors, and/or providers of products/services 2. Customer Satisfaction surveys with market acquired technologies 	<ol style="list-style-type: none"> a. # of farmers using specific irrigation technology b. # of m² under irrigation as a result of that technology <ol style="list-style-type: none"> a. Percentage of customers who say they have recommended a technology/service minus those who would not recommend a technology/service b. Abandonment rate 	<p><u>Learning Questions:</u></p> <p>What were the key challenges and lessons learned in the process of improving smallholder access to and control over water resources?</p> <p>Did the irrigation technologies meet the needs of smallholders? Why or why not? What recommendations do farmers have to improve the technologies?</p>

⁵ These indicators may also apply to Objectives 3 and 4 but should be reported only once.

⁶ Irrigated area must account for cropping intensity (e.g., 1 ha of land irrigated twice per year equals 2 ha of irrigated land)

IDE-Wide Objectives	Guideline Indicators	Suggested Means of Verification	Suggested Data Needs	PRISM Learning Questions and Information Sources
		3. Farming system case-studies (MonQi) <ul style="list-style-type: none"> - Monitoring net-income impacts of changes in farming systems - Monitoring changes in risk reduction comparing traditional and IDE-promoted farming systems (irrigation, horticulture, crop varieties, etc.) 	c. Availability of technology for farmers a. Productivity measured as net value of production per area irrigated b. Effect on water availability and quality of increased irrigation in the watershed area c. Detailed information on cropping patterns, rotations, livestock-agriculture linkages, input use, etc. to assess nutrient balance and water efficiency	What process is recommended to increase and/or improve irrigation use by women, disadvantaged community members and the very poor? <u>Sources of Information:</u> <ul style="list-style-type: none"> - Deduct lessons learned from an analysis of systematically gathered detailed case stories of 'best practice' and 'significant change stories' in relation to farmer-market interaction. - Discuss country experiences in IDE PRISM seminars - Participate in workshops for feedback form other organizations and researchers
4. Improved supply of agricultural inputs ⁷	<ul style="list-style-type: none"> • Change in use of purchased inputs by farmers • Change in knowledge/capacity of farmers in proper use of inputs • Customer satisfaction with inputs (including quality, timeliness, etc.) • Customer satisfaction with input suppliers (including service, technical advice, etc.) 	1. Sales records of producers, distributors, and/or providers of relevant quality inputs 2. Baseline and bi-annual monitoring survey regarding knowledge of quality attributes of (selected) quality inputs 3. Customer Satisfaction surveys with market acquired improved inputs	a. # of farmers that are using improved inputs a. Knowledge about quality attributes of inputs and meaning of information a. Percentage of customers who say they have recommended a technology/service minus those who would not recommend a technology/service b. Abandonment rate c. Availability of improved inputs for farmers	<u>Learning Questions:</u> What process is recommended to ensure that women and disadvantaged community members access and effectively utilize quality inputs? What were the key challenges in the process of increasing timely access to quality inputs? What were the key lessons learned in this aspect of the program? <u>Sources of Information:</u> <ul style="list-style-type: none"> - Deduct lessons learned from an analysis of systematically gathered detailed case stories

⁷ Type of "agricultural inputs" to be specified for each country program

IDE-Wide Objectives	Guideline Indicators	Suggested Means of Verification	Suggested Data Needs	PRISM Learning Questions and Information Sources
		4. Farming system case-studies (MonQi) to <ul style="list-style-type: none"> - Monitor net-income impacts of changes in farming systems - Monitor changes in risk reduction comparing traditional and IDE-promoted farming systems (irrigation, horticulture, crop varieties, etc.) 	b. Productivity measured as net value of production per area for which improved inputs are used	of 'best practice' and 'significant change stories' in relation to farmer-market interaction. <ul style="list-style-type: none"> - Discuss country experiences in IDE PRISM seminars - Participate in workshops for feedback form other organizations and researchers
5. Increased and improved delivery of business support services ⁸ to farmers and value chain actors	<ul style="list-style-type: none"> • Change in number of service providers • Change in number of clients of service providers • Use of services by farmers and VC actors • Costs to obtain services • Customer satisfaction with services • Quality of service to smallholders 	1. Sales records of producers, distributors, and/or providers of relevant services disaggregated by gender and economic status	a. Change in number of service provider clients who are smallholders and women b. Change in customer satisfaction	<u>Learning Questions:</u> What were the key challenges in the process of increasing/improving service delivery? What were the key lessons learned in this aspect of the program? What process is recommended to ensure that women and disadvantaged community members access services? <u>Sources of Information:</u> <ul style="list-style-type: none"> - Deduct lessons learned from an analysis of systematically gathered detailed case stories of 'best practice' and 'significant change stories' in relation to farmer-market interaction. - Discuss country experiences in
		5. Annual focus group discussions with smallholders to assess their perception of change in relation to key parameters of quality assessment of inputs		
		3. Customer Satisfaction surveys with business support services	a. Percentage of customers who say they have recommended a technology/service minus those who would not recommend a technology/service b. Abandonment rate c. Availability of technology/service for farmers	
		2. Baseline and bi-annual monitoring survey: <ul style="list-style-type: none"> - Access to relevant services provided by IDE, NGOs, GOs, private sector (specific to each country context) 	a. Change in number and types of SPs (soil testers, paravets, credit, new types of SPs) based on local context	

⁸ Type of "business support services" to be specified for each project

IDE-Wide Objectives	Guideline Indicators	Suggested Means of Verification	Suggested Data Needs	PRISM Learning Questions and Information Sources
		3. Inter-institutional coordination reports <ul style="list-style-type: none"> - Quarterly reports on activities of other service providers in the project area with a checklist to assess the level of support and expected impact/outreach of their services 	<ul style="list-style-type: none"> a. Level of subsidy from IDE or other organizations b. Number of clients c. Quality or intensity of service delivery to average client 	IDE PRISM seminars <ul style="list-style-type: none"> - Participate in workshops to get feedback form other organizations and researchers
		4. Focus groups <ul style="list-style-type: none"> - Annually with smallholders to assess their perception of the quantity and quality of service provisioning in the area - Learning from focus group discussions with selected service providers to discuss outcome of community focus group discussions. 		

Note: All data to be disaggregated by gender where feasible.

Appendix A: Survey Forms

The survey forms in this appendix can assist in the process of identifying opportunities and constraints for smallholders in a particular sub-sector under examination. These surveys are useful to gather information regarding participants in the sub-sector; market relationships; advantages and disadvantages of current crops; volume produced, sold and consumed and profits in different seasons; transport; consumption preferences; constraints, etc. The surveys were developed and used by IDE in Cambodia and focus on the vegetable sub-sector, but the forms can be modified for use in any context for any sub-sector. Below is a survey form for each of the following actors in the value chain: input dealers; farmers; distribution players; consumers; and restaurants.

Vegetable Survey for Distribution Players/Actors

Q # _____

Interviewer name: _____	Interview date: _____
Respondent name: _____	Village: _____
Commune: _____	District: _____
	Province: _____
Market name: _____	Player type: _____

Questions for Actors in the Sub-sector:

Approximately how many other actors would you say operate in your market? _____

Vegetable/Fruit Types:

What are the crops that you usually sell?

Where do you get these vegetables in each season?

- In the dry season:
- In the wet season:

What are the three best/most profitable vegetables you sell and why?

Three best crops	1	2	3
Advantages			
Disadvantages			

If currently dealing in these vegetables (specific statistics):

Dry season volume			
Wet season volume			
Dry season source			
Wet season source			
Average purchasing price per kg in:			
Dry season			
Wet season			
Average selling price or profit margin per kg in:			
Dry Season			
Wet Season			

What are the three best/most profitable processed products you sell and why?

Best processed products	1	2	3
Advantages			
Disadvantages			

If currently dealing in these vegetables (specific statistics):

Dry season volume			
Wet season volume			
Dry season source			
Wet season source			
Average purchasing price per kg in:			
Dry season			
Wet season			
Average selling price or profit margin per kg in (circle the applicable one):			

Dry season			
Wet season			

General statistics (for all vegetables/fruits, including the three specific crops). Fill out the following areas regarding total vegetables in kg that the actor sells/imports/exports, average prices and percentage of wastage or spoilage:

	Dry Season	Wet Season
Volume <ul style="list-style-type: none"> Local vegetables sold Local vegetables exported Imported vegetables sold 		
Average purchasing price per kg		
Average selling price per kg		
Average percentage of wastage or spoilage		

Fill out the following areas dealing with the total processed products (in kilogram) that the actor sells/imports/exports, average prices and percentage of wastage or spoilage.

	Dry Season	Wet Season
Volume <ul style="list-style-type: none"> Imported processed product sold Local processed product sold Local processed product exported 		
Average purchasing price per kg		
Average selling price per kg		
Average percentage of wastage or spoilage		

Market Relationships

Who do you buy from?

Who do you sell to?

How do you do your work? Describe a typical day:

Are there special purchasing/buying relationships? For example, do you purchase/sell on credit?

What is the smallest quantity you sell?

At which quantity do you start to sell/buy at wholesale prices?

Suggested Follow-up/Additional Questions:

When selling to markets, what percentage of markets are commune level _____, district center _____, provincial center _____, and capital city _____ ?

What are the transport arrangements? Do you pick up the produce or is it delivered?

If involved in more than one channel, what percentage goes through each?

Are you a farmer yourself?

Constraints

What makes this type of work difficult?

What would make it easier and/or more profitable?

What constraints do you face in the following areas?

Would you benefit from training/knowledge about managing a business?	
Would you benefit from additional training/technical knowledge?	
How do you finance your business? Do you have problems accessing credit to operate or expand your business?	
Does lack of infrastructure (such as poor roads and poor communications systems) hurt your business or prevent market access?	
How do you receive information on market prices, demand, customer preferences etc? Do you have difficulty finding this information?	

Vegetable Survey for Input Dealers

Q# _____

Interviewer name: _____	Interview date: _____
Respondent name: _____	Village: _____
Commune: _____	District: _____
	Province: _____
Market name: _____	Player type: _____

Actors in Sub-sector:

Approximately how many other input dealers operate in your market/commune? _____

What products do you currently sell (e.g. seeds, fertilizers, pesticides, equipment)? Are these products used to produce both rice and vegetables?

Do you sell animal feed and maintenance products?

Do you sell any non-agricultural products? If yes, what?

Vegetable/Fruit Input Types:

What kind of vegetable/fruit seeds/fertilizer/pesticides do you sell?

Where do you get these inputs?

- In dry season:
- In wet season:

How do you decide what to stock?

What three types of seeds are most profitable, popular, etc.?

Seed – Crop	1	2	3
Advantages			
Disadvantages			
Dry season volume			
Wet season volume			
Dry season source			
Wet season source			
Average purchasing price per kg/can in:			

Dry season			
Wet season			
Average profit margin per kg/can in:			
Dry season			
Wet season			

What three types of fertilizer are most profitable, popular, etc.?

Fertilizer - Crop	1	2	3
Advantages			
Disadvantages			
Dry season volume			
Wet season volume			
Dry season source			
Wet season source			
Average purchasing price per kg/bag (50kg) in:			
Dry season			
Wet season			
Average profit margin per kg/bag (50kg) in:			
Dry season			
Wet season			

What three types of pesticide are most profitable, popular, etc.?

Pesticide - Crop	1	2	3
Advantages			
Disadvantages			
Dry season volume			
Wet season volume			
Dry season source			
Wet season source			
Average purchasing price per bottle/packet (.....g) in:			
Dry season			
Wet season			
Average profit margin per bottle/packet in:			
Dry season			
Wet season			

General Statistics for all Seeds, Pesticides, and Fertilizers (including the specific items detailed above)

Fill out the following areas regarding average total volume, price and percentage of wastage or spoilage.

	Dry Season	Wet Season
Volume of:		
Seeds – kg/can		
Fertilizers – kg/bag		
Pesticides – bottle/packet		
Average purchasing price per kg/can/bag/bottle/packet:		
Seeds		
Fertilizers		
Pesticides		
Average profit margin per kg/can/bag/bottle/packet:		
Seeds		
Fertilizers		
Pesticides		
Average percentage of wastage or spoilage:		
Seeds		
Fertilizers		
Pesticides		

Market Relationships

Where do you purchase your seeds, fertilizers, and pesticides?

Who do you sell to?

Are there special purchasing/buying relationships such as credit arrangements?

Constraints

What makes this type of work difficult?

What would make it easier and/or more profitable?

Do you provide training to farmers with your products? If so where do you get your information from?

Are you a farmer yourself?

What constraints do you face in the following areas?

Would you benefit from training/knowledge about managing a business?	
Would you benefit from additional training/technical knowledge?	
Do you have problems accessing enough inputs for your work? Are these inputs of adequate quality?	
How do you finance your business? Do you have problems accessing credit to operate or expand your business?	
Does lack of infrastructure (such as poor roads and poor communications systems) hurt your business or prevent market access?	
How do you receive information on market prices, demand, customer preferences etc? Do you have difficulty finding this information?	

Vegetable Survey for Farmer

Q # _____

Interviewer name: _____	Interview date: _____
Respondent name: _____	Village: _____
Commune: _____	District: _____ Province: _____

Actors in the Sub-sector:

Approximately how many other vegetable farmers are in your village? _____

Vegetable Types:

What are the crops you currently grow?

What are the advantages/disadvantages of each of these vegetables/fruits?

What are the three best vegetable crops to grow and why?

Best crop name	1	2	3
Advantages of this crop			
Disadvantages of this crop			
Input source			

If currently growing these vegetables/fruits (specific statistics):

Dry season volume			
Wet season volume			
Dry season profit			
Wet season profit			

General Statistics (for all vegetables/fruits that the farmer produces, including the three specific crops above)

How many total fruits/vegetables (in total kg) do you produce in each season?

Dry season: _____ Wet season: _____

What price, on average, do you pay for inputs/investment (total price in local currency) in each season?

Dry season: _____ Wet season: _____

What is the average profit margin for your produce (total price in local currency) in each season?

Dry season: _____ Wet season: _____

For what price, on average, do you sell your produce (in local currency) each kg?

Dry season: _____ Wet season: _____

What is the average percentage of wastage or spoilage? _____

How much land is used for growing your crops? _____

How many times do you grow in each season? Dry season: _____ Wet season: _____

Which months of the year do you produce vegetables?

Market Relationships

Where do you get your inputs from? _____

Who do you sell to? _____

How do you do your work? Describe a typical day.

Do you also grow rice or have other sources of income?

Are there special purchasing/buying relationships (e.g. credit)?

What are the transport arrangements? If involved in more than one channel, what percentage goes through each channel? (For example, for farmers, how much do you sell directly to market? What percentage is sold through a middleman?)

What percentage of the vegetables that you produce do you keep for domestic consumption?

Under which conditions do you sell to a middleman? When do you decide to market your products yourself?

Constraints:

What makes this type of work difficult?

What would make it easier/ more profitable?

What constraints do you face?

Are there technologies that would help you in your work?	
Would you benefit from training/knowledge about managing a business?	
Would you benefit from additional training/technical knowledge?	
Do you have problems accessing enough inputs for your work? Are these inputs of adequate quality?	

How do you finance your business? Do you have problems accessing credit to operate or expand your business?	
Does lack of infrastructure (such as poor roads and poor communications systems) hurt your business or prevent market access?	
Is lack of irrigation a constraint? If you had better irrigation, would you grow more vegetables or would you grow vegetables for a longer period or both?	

Vegetable Survey for Consumers

Name of interviewer: _____

Name of respondent: _____

Name of market or address of respondent: _____

1. How many members are in your household?
2. How many kilograms of vegetables does your family consume per week?
3. How many kilograms of processed products does your family consume per week? (give examples of processed products)
4. What are your three favorite vegetables?
5. What are your three favorite processed products?
6. Do you care if the vegetables and or processed products you purchase are imported or grown locally?
7. How do you purchase your vegetables and or processed products? At the market or direct from farmer?

Vegetable Survey for Restaurants

Name of interviewer: _____

Name of respondent: _____

Address of restaurant: _____

1. How or where do you purchase your vegetables? Direct from farmers? Markets? Wholesalers?
2. How or where do you purchase your processed products? Direct from farmers? Markets? Wholesalers? Also, please give examples of processed products.
3. How is the produce delivered?
4. What vegetables do you import? What do you purchase locally? By season?
5. Do you import any processed products?
6. What quantity of vegetables do you purchase per week?
7. What quantity of processed products do you purchase per week?
8. Which vegetables do you purchase the most of?
9. Which processed products do you purchase the most of?
10. Are you satisfied with the current vegetables available? If not, what would you change?

Appendix B: Pineapple Sub-Sector Market Assessment in India

Overview of Gajapati District in Orissa, India

The Gajapati District is one of the poorest areas in the state: more than 68 percent of the population live below the official poverty line and struggle to earn a livelihood under challenging circumstances. By most socio-economic measures - per hectare agricultural productivity, dependence of the population in secondary or tertiary sectors of the economy, employment levels, per capita income, or efforts in social modernization - the district is far below the national average.

The total geographical area of the Gajapati district of Orissa is 3,850 sq. kms with a total population of 572,201, as per the 1991 census. The district is characterized by fertile tract, hilly terrain, undulating landscape, glacial gorges, impassable mountain chains, plateaus, sparse population, perennial streams and rivulets, the absence of an all-weather road to many villages, and extreme climatic conditions. The most vulnerable people in the district are women, castes and tribes. In addition, Gajapati district is in a malaria endemic zone where the emerging health problems include falsiparum malaria and meningococcal meningitis.

Pineapple in Gajapati District

Approximately 3,000 farmers presently grow pineapple in 263 hectares in the Gajapati district. Of the two main varieties of pineapples - KEW and Queen - KEW is the local variety traditionally grown in the district. On average, the total production of pineapple is 3,987 MT. Per hectare, the production is about 14-15 MT. The Queen variety generates better seasonal income and sales (Rs 15-20 per kg) than the KEW variety (initial harvested produce sells for Rs 5-7; peak time harvested produce sells at Rs 2-3 per kg). However, most people grow the traditional KEW variety. The Queen variety is imported; very few people have adopted this variety: its seedlings are costly and are not available in sufficient quantity in the district. When few or no traders visit the area, produce often spoils and farmers experience huge financial losses.

Structure and Dynamics of the Sub-sector

Communities in the district have access to a rich natural resource base enabling farmers to grow a wide variety of horticulture crops, including pineapples, mangoes, citrus, lemons, bananas, jackfruits, ginger, and turmeric. However, farmers' social and economic networks are weak - they are physically distant from major markets. In addition, farmers do not market produce themselves - they sell the produce to the Scheduled Caste (the middlemen in the locality) who in turn sell it in and outside of Orissa. Outside businessmen rely on these local middlemen for the collection of pineapple. As a result, the farmers are at the most disadvantaged end of a long marketing chain.

There are a number of factors that prevent farmers from becoming strong market players. First, the produce is usually seasonal and has a short shelf life. Second, farmers live 10-15 kms in the interior hills and travel long distances on foot to reach the market. Because there is an abundance of produce during the 2-3 month peak season and this produce is highly perishable, farmers often resort to distress sales. As a result of distress sales, farmers have low investments in inputs and reduced quality of produce, which forces farmers to borrow from village moneylenders and mortgage their land for 2-3 seasons. In some cases, farmers cannot break out of this cycle and end up working as laborers on their own land.

A private entrepreneur established an agro-processing unit with substantial subsidies from the government. However, this agro-processing unit was not able to operate successfully and closed down. Although this led to loss of farmers' trust in the concept of processing facilities, farmers benefited from

the agro- processing unit: there was a standard fixed rate for the produce during the season, which provided a reliable source of income.

The Horticulture Department has a processing unit at the district headquarters, but it does not run on a commercial basis.

Sub-sector Actors

Growers: Growers are primarily small and marginal tribal growers who grow a number of horticultural crops, including pineapple, citrus, guava, jackfruit, mango, lemon, turmeric, ginger etc. on the hill terrace.

Middlemen: Middlemen are the local Scheduled Castes and shopkeepers. They are the main link between farmers and agents of the wholesalers. Middlemen contact the farmers in advance, pay them advance money and determine the delivery date, time and venue. Middlemen also inform the wholesaler regarding these arrangements and request the wholesaler to send transport for collection. Due to lack of communication facilities, collection centers are fixed where the truck arrives and the farmers bring their produce.

Traders: Traders are local businessmen who carry the produce to different markets and sell it to wholesalers. Similarly, some traders come from neighboring states including Andhra Pradesh, Madhya Pradesh, and within Orissa to buy local produce for onward trading. Major buyers outside Orissa come from Raipur, Nagpur, Bilaspur, and Bangalore; buyers from within Orissa come from Berehampur, Aska, and Bhanjanagar.

Wholesalers: Wholesalers are from large cities and towns of Orissa and other neighboring states. Wholesalers come either by themselves or they send agents who stay in the area for some time to make arrangements for the collection and lifting of the produce.

Food Processing Units: Sometimes the food processing units come directly from Orissa and other neighboring states for the procurement of pineapple. In Orissa, OMFED and the Horticulture Department make substantial purchases of pineapple and citrus to make juice and pulp out of pineapple. Since 2001-2002, OMFED has entered into the marketing of pineapple juice, jam, and ready-to-serve drinks. The food processing units procure pineapple directly from the growers. However a committee consisting of the local horticulturist, representative of the collector, OMFED representative, and the village headman, fixes the price. OMFED purchased 10 MT and 17MT during 2001-2002 and 2002-2003 respectively. The average procurement price per piece was Rs 3.28 and 4.09 respectively.

Retailers: Retailers, including regular shopkeepers and seasonal retailers, exist in district-level markets, large cities and towns of the state and neighboring states. Retailers from the nearby districts come to the area for collection of pineapple.

Input Suppliers: Input suppliers include the Horticulture Department of the Government of Orissa; the Integrated Tribal Development Agency of the Government; Non Governmental Organizations; Scheduled Caste middlemen and shopkeepers. These agencies provide knowledge and skills on horticultural crops, seedlings, short-term loans etc. While the middleman, shopkeepers and NGOs have been very active in this regard, government agencies have limited impact due to government bureaucracy, communication problems, etc. The “self-help group” concept has recently been introduced by some local NGOs in the district.

Markets: The main buyers for pineapple are district-level wholesale and retail markets; state-level wholesale and retail markets; food processing units; outside state wholesale and retail markets.

Supply Chain and Product Flow

Wholesalers/retailers in Orissa and neighboring states send representatives to arrange pineapple procurement by contacting either local agents or the village headman to settle on the price, date, place of delivery. The wholesaler/retailer representatives advance payment to ensure the collection of pineapple on the specified date. These local agents contact growers/ middlemen and make similar arrangements to ensure collection. On the specified date, farmers arrive with head-loads of pineapple and deliver the produce to the collection center. If the farmer employs other people to carry his produce to the collection center, the farmer pays Rs 0.25 per piece for labor.

In some cases, traders travel directly to the villages, remain there for about one week, relying on the village headman and/or the farmers to complete the procurement transactions. Alternatively, traders purchase the produce and supply traders at other locations and/or carry the produce directly to urban markets for retail selling. Some traders also have permanent agents in the area who collect pineapples and other horticultural crops throughout the year.

Many small farmers borrow money from local Scheduled Caste (middlemen in the locality) or shopkeepers during emergencies. The middlemen/ shopkeeper then owns the cultivation and utilizes the farmer to oversee production until the farmer harvests on a wage basis. In this case, the farmers receive approximately 20-30 percent of the final sales price.

Pineapple is sold on a piece rate basis. If the pineapple size is small, some buyers count two or three small pineapples as equivalent to one. Some traders require the farmer give the buyer 5 free pieces for every 100 pieces. Since most farmers are illiterate, they are susceptible to unscrupulous buyers during produce counting and settling of final payment. Some buyers who offer higher prices often use in this practice to entice farmers who are attracted to the price but do not realize they are being cheated in other ways.

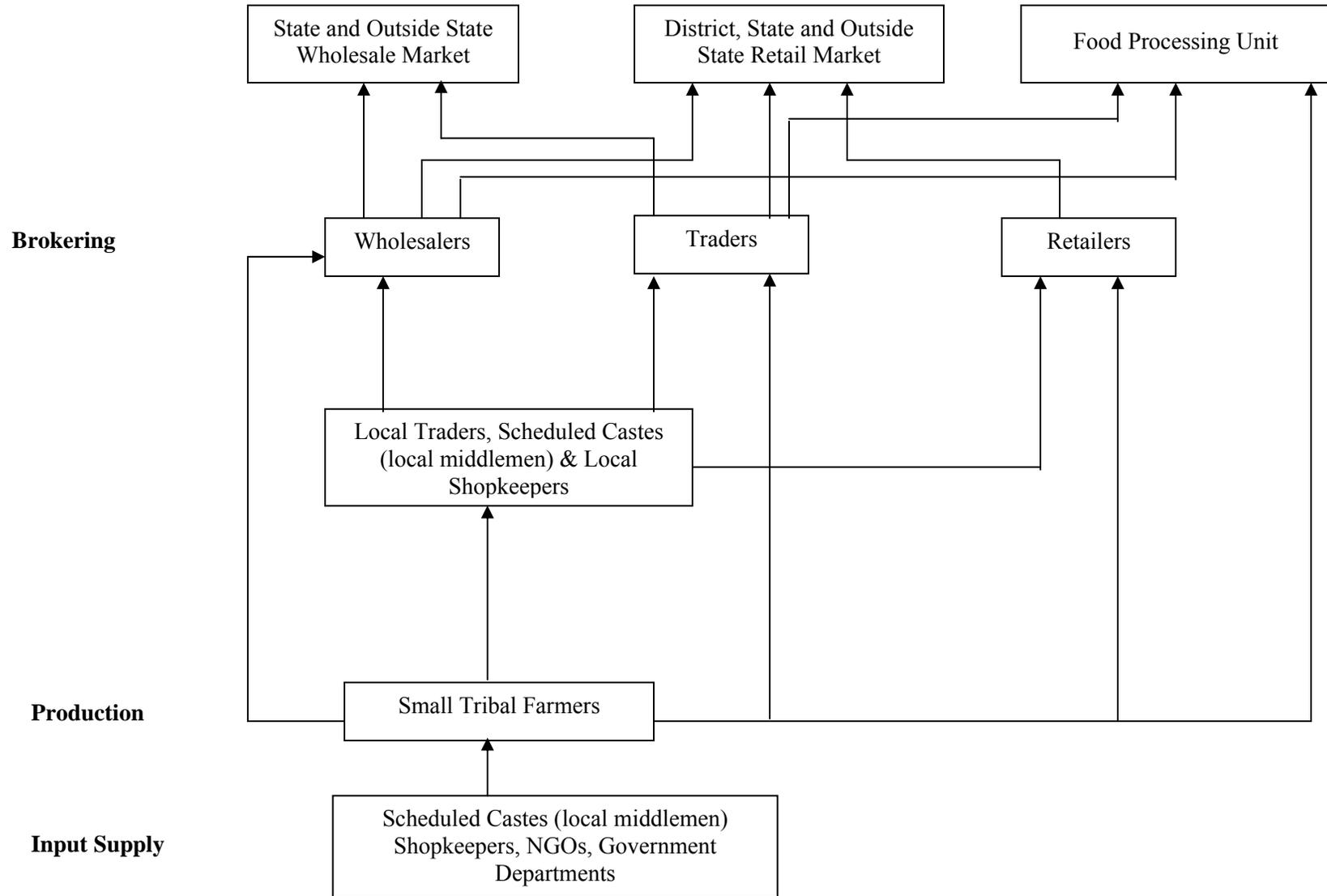
For 100 pieces of pineapple the farmer receives Rs 400/- @ Rs 4/- per piece or kg (one piece is approximately 1 kg.) on average (assuming Rs 4/- per piece), with Rs 50/- taken by the agent. The farmer also bears the cost of transportation from his farm to the collection center, which is Rs 0.25 per piece (i.e. Rs 25/- per 100 pcs). The farmer also spends approximately Rs 25/- for harvesting, and an additional Rs 150/- for cleaning the plantation site, fencing, seedling plantation, manure, etc. The total cost to the farmer is Rs 250/- with average net income for the farmer of Rs 150/- on a sale of 100 pieces or kg. On average, a small-scale farmer produces approximately 3,000-5,000 pieces of pineapple.

The following information refers to Orissa state only: The pineapple is sold in the final retail markets at Rs 7- 15 per piece. The trader's expenses include transportation at approximately Rs 6,000/- per mini truckload (i.e., about 6,000 pieces). Therefore, for 100 pieces, they spend Rs 100/- for transportation. The total sales price is Rs 700@ Rs 7/- per piece or per kg. With expenses at Rs 500 (400 paid to farmers @ 100 for transportation), a trader receives net income of Rs 200/- on a sale of 100 Pieces or kg.

Food processing units collect pineapple and extract juice at the local level. They have their own plants for producing a variety of products, including juice, jam and squash. Many of these value-added products are selling well in the market, with a profit margin of between 20-22 percent.

The pineapple season lasts about approximately 2 to 4 months (May to August).

Pineapple Sub-Sector Map



Notes on Pineapple Sub-sector Map:

- i. SCs: Scheduled Caste, the middlemen in the locality
- ii. NGOs: Non-Governmental Organizations
- iii. Shopkeepers: Petty shopkeepers in the locality who provide commodities to farmers
- iv. Traders: Local traders and from out side the state
- v. Food Processing Units: These include Orissa Milk Federation and the Horticulture Department, AAREN food products. They prepare diversified products, such as juice, jam, pulp and ready – to – serve drinks
- vi. Wholesalers: From the state & neighboring states like Andhra Pradesh, Madhy Pradesh & Maharastra
- vii. Retailers: Regular fruit sellers and seasonal retailers
- viii. Transportation: Mainly by trucks from the collection centers
- ix. Collection: It takes place at selected centers. Growers come to the center each with a head-load of produce
- x. Channel 1: 75% of transaction
- xi. Channel 2: 25% of transaction

Appendix C: Vegetable Sub-Sector Market Assessment and Intervention Design, Bangladesh

Overview of Sherpur Area

The study focused on Sherpur, Bangladesh, which is the fourth largest Upazilla of Bogra Zilla situated on the bank of Korotoya River in the northwest region of the country. Sherpur came into existence on 12 August 1870. According to the District Gazetteers, the town of the Sherpur is an ancient place bearing historical significance. It was one of the most remote areas of the region due to poor infrastructure, weak industrial development, and remnants of feudalistic agriculture and landholding systems. Tremendous infrastructure development has contributed to the region becoming increasingly mainstreamed.

Area and Location

The Sherpur Upazilla occupies an area of 296 sq. km including 2.69sq.km of river area. It is located between 24⁰32' and 24⁰44' north latitude and 89⁰20' and 89⁰32' east longitude. The Upazilla is bounded on the north by Bogra Sadar, on the east by Dhunat Upazilla, on the south by Raiganj and Tarash Upazilla on the west by Nandigram and Singra Upazilla.

Agriculture in Sherpur

There are 45,258 households in Sherpur Upazilla; the average household size is 5.0. In this Upazilla, 73.52 percent of dwelling households depend on agriculture; 55.91 percent of the households own agricultural land (source: BBS 1995). Among the 28,900-agriculture dependent household, 25 percent of them cultivate vegetables.

The Sherpur area is divided into 24 agricultural blocks, with two main soil types: barind tract and floodplain. Approximately 20,000 hectares in Sherpur are under irrigation; the remaining 3,707 hectares do not use irrigation. Total percentage of irrigated land is 85 percent. Among the 28,900 agricultural families, 275 are landless; 4,200 are small land holders; 15,412 are medium-sized landholders and 7,706 are large-scale land owners. Total cultivable land is 23,707 hectares; of this, 1,882 are single-cropped hectares; 28,610 are double-cropped hectares; and 22,560 are triple-cropped hectares. This study found that HYV aus, aman, boro, pajam, wheat, pulses, and oil seeds are regular crops; recently, maize has been introduced in this area. Commercial vegetable cultivation has been recently undertaken with production of eggplant, pointed gourd, bitter gourd, ridge gourd, water gourd, snake gourd, cauliflower, cabbage, bean, French bean, pumpkin, tomato, radish, okra, arum and chilies. Vegetables are grown intensively in the floodplain. Although the soil type in the barind area is preferable for vegetable cultivation, people are unaccustomed to vegetable production in these areas.

Market Assessment Findings

An opportunities and constraints analysis was conducted; findings are presented below. These findings were presented in a validation workshop in which key informants participated, including farmers and service providers, all of whom were interviewed prior to the workshop. Detailed feedback and information received in the validation workshop was used to design illustrative intervention strategies in two of the constraints areas identified. These strategies are detailed below.

Based on the market analysis, it was determined that the following market opportunities existed in the Sherpur, Bangladesh:

1. Demand for vegetables is high and consistent
2. Potential for raising profits is high in terms of both productivity and price

3. Opportunity for reducing chemical fertilizer use through the introduction of organic fertilizer is high

Constraints to smallholder-oriented horticulture-based market development are presented in the table below.

Table 17: Market Constraints in the Horticultural Sub-sector in Sherpur, Bangladesh

Market Constraint	Target Group	Proposed Services or Facilitation Activities	Existing Potential Providers
1. Lack of knowledge, skills and information regarding cultivation practices of different vegetables	Farmer, Input Supplier	The facilitator assists in partnership/collaboration with existing providers	<ul style="list-style-type: none"> • DAE • Input providers • NGOs • Neighbors
2. Inadequate knowledge about soil nutrition and sustainable soil management	Farmer	Create provision for knowledge on soil nutrition and sustainable soil management	<ul style="list-style-type: none"> • SRDI • DAE • NGO
3. Lack of availability of quality seeds	Farmer	The facilitator conducts one-off awareness raising and advocacy campaign on benefit of quality seeds and creates linkages between quality seed dealers and vegetables growers	<ul style="list-style-type: none"> • Quality seed sellers • NGO • BADC • Farmers
4. Lack of access to irrigation water	Farmer	The facilitator assists private sector market linkage of Agro Market System (AMS) for appropriate irrigation technologies for DWA	<ul style="list-style-type: none"> • NGO • DAE • RDA • Agriculture tools sellers
5. Lack of knowledge on application of IPM	Farmer	The facilitator mobilizes Department of Agriculture Extension (DAE) /NGOs to educate farmers on Integrated Pest Management (IPM) and builds capacity of local NGOs in IPM	<ul style="list-style-type: none"> • DAE • NGO
6. Risk of introducing new crops individually	Farmer	The facilitator forms informal farmers group and motivates them to grow vegetables in collaboration with other market actors	<ul style="list-style-type: none"> • DAE • NGO

7. Lack of appropriate credit delivery system	Farmer	The facilitator creates effective linkages between farmers and credit-providing NGOs / institutions / banks for vegetable production	<ul style="list-style-type: none"> • Money lenders • Wholesalers • Faria • NGOs • Banks • Shomity
8. Lack of market information on price and demand in other markets	Farmer, Wholesaler, Retailer	The facilitator assists private sector providers to establish sustainable flow of information to the informal farmer group	<ul style="list-style-type: none"> • DAE • Wholesalers • Faria (middleman) • NGOs • Banks • Shomity
9. Lack of access to appropriate spray machines	Farmer	Create provision for access of appropriate spray machines	<ul style="list-style-type: none"> • Farmers / Neighbors • Agriculture tools sellers
10. Unavailability of labor in season	Farmer	Provisions for labor saving equipment and machinery for cultivation and harvesting	<ul style="list-style-type: none"> • Agricultural machinery suppliers • BADC

Abbreviations in Table 17:

DAE: Directorate of Agricultural Extension

Faria: Middlemen

RDA: Rural Development Academy

Horticultural Intervention #1 – Sherpur, Bangladesh

Constraint: Lack of appropriate and adequate knowledge, skills, and information on cultivation practices and other aspects of vegetable production of different vegetable crops, which limits productivity and profitability.

Service: A facilitator, in partnership with existing providers, provides knowledge, skills, and information relating to cultivation practices for various vegetable crops.

Description of the Service: During field interviews, it was observed that the knowledge, skills and information regarding cultivation of different high-value vegetable crops is a critical constraint in the sub-sector and negatively impacts plant growth, as well as the profitability and livelihoods of a large number of small-farm households engaged in vegetable cultivation and sales. Knowledge and skill development would focus on the exchange and dissemination of improved cultivation techniques of high value vegetable crops, including the following: off-season cultivation; variety selection; seed bed preparation; transplantation practices; sustainable soil management; integrated pest management; post harvest handling.

Market Information

- Existing providers of knowledge, skills and information include: Directorate of Agricultural Extension; NGOs (BRAC, TMSS); private-sector input suppliers; neighbors.
- Market size and penetration: Provision of information, skills and knowledge related to vegetable production can potentially be utilized by a large number of small farmers and would benefit all actors in the sub-sector directly or indirectly. Out of 7,257 households in Sherpur Upazilla, approximately 15 percent are involved in the cultivation of vegetables. With the initiation of this service, it is believed that other farmers would start growing vegetables as a source of income. There are approximately 22 input suppliers.
- Frequency of use: Farmers currently use their own indigenous knowledge and experience to cultivate vegetables. Only a few farmers who have received assistance from DAE and NGOs have reported using these services at least once per year.
- Constraints and opportunities in the market for services:
 Demand: Demand among farmers to improve their income through vegetable cultivation is strong. Field research and interviews with key informants demonstrate a need for this service. Existing private sector input suppliers provide some information on vegetable cultivation as an embedded service. Currently farmers rely on their indigenous knowledge and experience and use native techniques that are profitable for them in the short run.
 Supply: DAE lacks adequate manpower, resources, and motivation; DAE provides inadequate extension services, which leads to poor awareness and knowledge. NGOs limit program focus on homestead and nutrition and high-yielding varieties of vegetables. The private sector lacks training and knowledge.
- Satisfaction with services: Generally farmers are frustrated and dissatisfied by the present level of services provided by the various actors.
- Awareness of services: Awareness of services is very high.
- Proposed provider(s) to target for interventions: A facilitator would design, organize and implement a comprehensive program to develop awareness and knowledge on the issues with the participation of the government (Department of Agriculture and Extension), NGOs and private sector (large input manufacturers and dealers) service providers.

Potential impact on the fresh vegetable sub-sector: Increased awareness and knowledge regarding vegetable production and processing (quality off-season vegetable cultivation, variety selection, seed bed preparation, transplanting practices, sustainable soil management, integrated pest management, post-harvest handling) will:

- Provide farmers and processors with vision and understanding regarding the potential of vegetable production and processing as a highly profitable business;
- Strengthen the overall vegetable market;
- Increase farmers' income;
- Increase engagement of female members in the trade.

Financial sustainability: People are willing to pay for these services. An awareness-raising campaign can stimulate demand and supply of private sector providers. The design and implement of the intervention should lead to service provision at full cost.

Facilitation activities:

- a. Stakeholder mobilization and motivation
- b. Dialogue meetings to include private sector
- c. Capacity building of private sector service providers
- d. Promotion of best practices
- e. Exchange visits

Methodology

- a. Needs assessment survey
- b. Stakeholder workshops
- c. Farmers' group meetings
- d. Communication and motivation through audio-visual medium and tools

Exit Strategy

- a. Create no undue expectations
- b. Create no dependency on facilitator
- c. Resist temptation to take on provider's role
- d. Develop capacities of service providers
- e. Gradually transfer facilitator's functions to service providers
- f. Communicate transparently the exit strategy and time frame to all stakeholders from the outset
- g. Develop post-exit monitoring and follow up plan

Horticultural Intervention #2 – Sherpur, Bangladesh

Constraint: Lack of availability of quality seeds. In addition, sub-sector actors do not have appropriate and adequate knowledge or awareness regarding quality seed specifications, which limits smallholders' productivity and profitability.

Service: A facilitator conducts awareness and advocacy campaigns regarding the benefits of quality seeds and creates linkages between quality seed dealers and vegetable growing farmers. The service seeks to raise awareness regarding quality seed standards, compliance to quality specifications and encouraging quality seeds suppliers to make quality seeds available to farmers.

Description of the Service: During field research, it was observed that seed quality for high-value vegetable crops is a critical constraint in the sub-sector that can profoundly affect growth, profitability and livelihoods of a large number of small-farm households engaged in vegetable cultivation and sales. The service would seek to make available quality seed that provide the correct rate of germination and increase yield of vegetable production.

Market Information

- Existing providers of seed include: private seed suppliers; NGOs (BRAC, TMSS); Bangladesh Agricultural Development Corporation (BADC); farmers. Farmers generally rely on input suppliers and personal experience to select seed.
- Market size and penetration: Quality seed has the potential for usage by all the farmers. Currently, approximately 10 percent of 28,157 farms households in Sherpur upazilla access quality seed. There are approximately 22 input suppliers providing seeds in the upazilla.
- Frequency of use: Farmers use seed at least once a year.
- Constraints and opportunities in the market for services:
 Demand: Field research and interviews with key informants demonstrate strong demand for quality seed.
 Supply: BADC and BRAC have inadequate supplies of high-value vegetable seed. The private sector lacks local production capacity.
- Satisfaction with services: Generally farmers are frustrated and dissatisfied with the quality of seeds provided by input providers.
- Awareness of services: Awareness of the need of quality seed is very high; however, knowledge needed to select quality seed is low.
- Proposed provider(s) to target for interventions: A facilitator would design, organize and implement a comprehensive program to develop awareness and knowledge on the issue with the participation of the

government (Department of Agriculture and Extension), NGOs, BRAC and private sector (large seed dealers) service providers.

Potential impact on the fresh vegetable sub-sector: Increased awareness and knowledge regarding the benefits of quality seeds and linkages between quality seed dealers and vegetable farmers would provide the farmers and processors with:

- Vision and understanding regarding the importance of using quality seed for quality production
- Strengthen the overall vegetable market
- Increase farmers' income

Financial sustainability: People are willing to pay for the service. An awareness-raising campaign can stimulate demand and supply of the private sector provider market. The intervention design and implementation will lead to service provision at full cost. Demand creation will achieve economic volume of transactions for service providers

Facilitation activities:

- a. Stakeholder mobilization and motivation
- b. Dialogue meetings to include private sector
- c. Capacity building of private sector service providers
- d. Promotion of best practices

Methodology

- a. Train seed dealers
- b. Show expiration date on seed packages
- c. Test germination rates
- d. Seed dealer should annual obtain license from DAE on the basis of specified criteria.

Exit Strategy

- a. Don't create undue expectations
- b. Don't create dependency on facilitator
- c. Resist temptation to take on provider's role
- d. Develop capacities of service providers
- e. Gradually transfer facilitator's functions to service providers
- f. Communicate transparently the exit strategy and time frame to all stakeholders from the outset
- g. Lay out post-exit monitoring and follow-up plan

Glossary of Terms

Environment: The regulations, informal rules, and support organizations that influence business opportunities, incentives, and actions.

Evaluation: A process of identifying and assessing an intervention to determine whether the activities contributed to the desired outcomes and objectives and to determine the effectiveness, efficiency, relevance and impact of the interventions.

Impact: Changes (intended or unintended) in the lives of people, the environment and/or the context since the start of the intervention as a result of the intervention.

Indicator: A quantitative or qualitative characteristic to measure progress towards goals.

Leverage: The ability to reach large numbers of micro and small-scale enterprises at a single stroke.

Leveraged intervention: A promotional activity that affects large numbers of small firms simultaneously.

Monitoring: The systematic, on-going process of tracking key indicators to understand changes over time.

NPL: National Poverty Line. For Monitoring and Evaluation of PRISM projects, the NPL will be determined for each country program based on a commonly accepted estimate by the national government, World Bank, etc.

PPP: Purchasing Power Parity - A method used to equalize the purchasing power of different currencies for a given basket of goods.

Sector: One of nine categories of economic activity defined by the International Standard Industrial Classification (ISIC) of the United Nations. Sectors are sometimes categorized as: primary (agriculture and mining); secondary (manufacturing, utilities, and construction); and tertiary (commerce, transport, services, and government).

Sub-Sector: A network of related firms that supply raw materials, transform them into finished products and distribute finished goods through vertical supply channels to a particular consumer market. A sub-sector normally includes a series of vertically related industries together with segments of the transport, service, and commercial sectors that link them together.

Sub-sector map: A schematic diagram that describes the product flows and contractual relationships among firms in a sub-sector.