COMMERCIALIZATION IN HORTICULTURE: PROSPECTS, CHALLENGES AND STRATEGIES

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ABSTRACT

Nepal has diverse agro-climatic conditions. Hills and mountains have different niche areas suitable for the production of various high value commodities. There is tremendous scope for commercial agricultural production to enter into the international market. Among various agricultural components horticultural crops are the important ones for commercial prodution. Poor transportation facilities and poor infra-sturcture, lack of know-how, higher cost of production, poor linkage to the international market etc. are the major constraints. Suitable pocket areas for the production of fruits, vegetables and other high value commodities have been identified and listed. Some of the suggestions and guidleines are described in this paper so that commercial production of agriculture can be brought into practice.

INTRODUCTION

Agriculture is the backbone of Nepalese economy. About 66 % of the population depends on agriculture and contribution of agricultural products to national GDP is 36% percent. Nepal has wide range of climate suitable to grow various kinds of fruits, plantation crops, vegetables and high value commodities. The country has a total land area of 147,181 square kilometers. Hill ecological belt shares 61,345 square kilometers of land, which is approximately 42% of total land area. The mountain belt occupies the second largest land area of 51817 square kilometers, i.e. about 35%, while the Terai belt has the smallest area of about 34,019 square kilometers of 23% of the total. Terai is considered as the granary of Nepal suitable for the production of cereal food grains. In the hills and mountains the productivity of food grains per unit time and area is less compared to Terai and river basins. On the other hand there exists a wide range of agro ecological diversity suitable for the production of various high value crops and medicinal plants. At present context the production practices and technology are of conventional type. Most of the farmers produce for their own consumption. Market oriented commercial production has been started in some of the pocket areas near to the cities. Farmers have been aroused for commercial production in such areas. To shift from conventional system of farming to commercial one need skilled manpower, higher investment and market assurance. Higher net returns are expected from the commercial farming and it is possible only by growing high value commodities. There are various constrains for commercial production systems, these are briefly highlighted in the article and suggestions are made how commercial production is possible.

OPPORTUNITIES

Comparative advantage: The climate in hills and mountains differ from the Terai. During summer months the temperature in the hills and mountains is lower than Terai, suitable for the production of various vegetables which is not possible in the Terai and neighboring India and Bangladesh. The vegetables which are produced in the hills and mountains during summer are considered as off season vegetables as because they cannot be produced during summer season in Trai and India. Being off season they fetch higher price in the market. Because of diverse agro-ecological situations in the hills and mountains, various areas are suitable for growing different type of fruits and high value crops. A study was conducted to locate suitable pocket areas for different fruits and vegetables. Important pocket areas for commercial production of fruits, vegetables and other high value crops have been identified and are listed in this paper. In case of vegetables, the areas which are near to the market or high way corridor are more potential as they have easy access to the market. The selection of crop according to season and market demand is more important. Fruits and many other high value commodities are seasonal in nature and have specific paocket area for sustainable commercial production.

Employment Opportunity: Production of fruits, vegetables and other high value commodities (plantation, cash crops and medicinal herbs) in the village can create employment opportunity to the rural youths. At present situation large numbers of youth have been deployed in the overseas in search of job and the number is about 2,600,000. This drain of manpower to the overseas is because of no employment inside the country. Promotion of agricultural commercialization and agribusiness can create opportunities to youth of the nation.

National and International market: During the last two decades, Nepal has been under the process of rapid urbanization. It is expected that by 2030 about 50% of the population will live in the city. This will create a high demand for agricultural commodities in the markets. At present context also the import of fruits, vegetables and other high value commodities is increasing every year. Commercialization is needed to substitute the import as well as to promote export. In some commodities where import is increasing we can substitute by producing such commodities within the country such as; mango, banana, onion, potato, chili and other vegetables. On the other hand, by utilizing diverse agro-ecology of hills and mountains we can produce various high value commodities in niche areas and export to other nations. Government of Nepal has identified various high value commodities with high commercial value some of them are; cardamom, tea, coffee, ginger, fruits, vegetables, milk, fish etc. Cut flower production is also an emerging agribusiness in peri-urban and market access areas.
From the international market point of view, Nepal has become the member of WTO. It can export its production to other international markets. There is potential scope to export cardamom, tea, coffee, ginger, cut flower, areca nut, honey, fruits, off season vegetables and many medicinal herbs to other countries. Increased production of fruits, vegetables and high value commodities can contribute to the national economy. Production of vegetables and fruits can substitute the import. High value commodities and better quality fruits can be exported to overseas. There is tremendous scope to export oranges, apple to Bangladesh and off season vegetables to India. Cut-flowers can be exported to middle-east countries. At present condition, more than 60% of banana, 99% of apple, 98% of lime, 90% of mango and 100% of pomegranate are imported. Most of the fruits are imported from India, where as incase of apple 77 % from China and 22 % from India. Only 1 % of the market demand is fulfilled from domestic production. Increased production of fruits can substitute import and also there is scope to export.

Hills and mountains are not much suitable for the production of cereal and food grains. The productivity of food crops per unit area and per unit time is low in the hills and mountains. Horticultural crops are the major concern in the hills and mountains for commercial production.

Government Policies and Plans: Government of Nepal has always prioritized for agriculture development. In the 20 year agriculture Perspective Plan 1994/95 – 2014/15 the Government outlined the broad policy to transform subsistence agriculture into commercial agriculture through diversification and exploiting comparative advantage. The APP emphasizes a few priority inputs, and outcomes. The "Green Revolution" package for the *Terai* and high value commodities in the hills and mountain are the strategies to achieve "catch-up", growth, reach market, and reduce poverty and safe guard the environment. In the 10th Five-Year Plan (2002-2007), Three-Year Interim Plan (2007-2010) and National Agriculture Policy (2004) share the common thread of agriculture commercialization and diversification for broad-based inclusive growth and poverty reduction. In order to achieve the objective of agriculture policy and give a momentum to carry out the activities to make agriculture commercialized and competitive in regional and world markets the government has promulgated Agricultural Business promotion Policy, (2006). The main objectives of the policy are: (i) to facilitate market oriented competitive agriculture production, (ii) to contribute to internal and export markets promotion by developing the agro based industries/agri-business and (iii) to assist alleviation of poverty through commercialization of agriculture. Now the Government is formulating Agriculture Development Strategy (ADS) with the support of Asian Development Bank (ADB), International Fund for Agriculture Development (IFAD), Europian Union (EU), Food and Agriculture Organization (FAO), Swiss Agency for Development and Cooperation (SDC), Japan International Coperation Agency (JICA), Denmak Agency for iternational Development (DANIDA), World Food Pragram (WFP), United States Agency for international development (USAID), Department for International Development (DFID), the World bank and Australia Agency for International Development (AusAID). The ADS vision is "A competititve, sustainable inclusive agriculture sector that contribute to economic growth, improved livelyhood, and food and nutrition security. It will accelerate agriculture sector growth through four strategic components including improved governmence, productivity, commercialization and compeitiveness. Priority will be given to inclusiveness (both social and geographic), sustainability (both natual resources and economic) development of private sector and cooperative secotor and connectivity to market infrastructures (agricultural roads, collection centers, packing houses, market centers), information infrastructures and ICT, and power infrastructure.

Climate and Crop: The climate of Teari, Inner Terai, river side areas and foot hills is suitable for the production of food grains, jute, tobacco, cotton, mango, banana, papaya, litchi and pineapple. Mid-hills are suitable for the production of maize, millets, citrus (orange, sweet orange and lime), pomegranate, litchi, *Lapsi,* persimmon, tea, coffee, cardamom and cut-flowers. Higher mountain has temperate climate and is suitable for the production of, potatoes, fruits, like apple, walnut, pistachio and kiwi, while lower mountains are suitable for the production of mild temperate fruits, like pear, peach, plum, apricot, etc. From the production point of view, many kinds of fruits and high value commodities can be grown in different parts of the country. Moreover, from

commercial point of view it is not feasible to grow all the crops in all the area. For sustainability, production should be concentrated to the area from where marketing is possible and at the same time economical. Suitable pocket areas for important commercial crops has been identified and listed below.

Mango	Sarlahi, Siraha, Mohattari, Dhanusa, Kapilvastu, Dang, Banke and Bardia.
Banana	Morang, Jhapa, Sunsari, Chitwan, Nabalparasi, Kailali and Kanchanpur
Papaya	Mahottari, Siraha, Saptari, Dhanusa, Rautahat, Bara, Parsa, Chitwan, Jhapa, Morang, Sunsari, Nawalparasi, Rupandehi, Makawanpur, Nuwakot, Kapilvastu, Tanahun, Kailai, Kanchanpur, Dang, Banke and Bardia.
Orange	Syangja, Tanahun, Lamjung, Kaski, Gorkha, Salyan, Dhankuta, Kavrepalanchowk, Tehrathum, Panchthar, Dhading, Khotang, Bhojpur, Dailekh, Palpa, Arghakhanchi, Gulmi, Baglung and all other districts in the midhill region.
Sweet orange	Sindhuli, Ramechhap, Dhankuta, Lamjung, Palpa, Myagdi, Doti, Baitadi, Dadeldhura, Bajura, Achcam, Darchula, Rukum, Pyuthan, Sankhuwasava, Panchthar, Illam, Okhaldhunga, Udaypur and Dolkha
Lime	Dhankuta, Terahthum, Panchthar, Taplejung, Dolakha, Nuwakot, Kavrepalanchowk, Dhading, Makawanpur, Lamjung, Tanahun, Palpa, Doti, Dadeldhura, Baitadi, Accham, Dailekh, Syangja, Gulmi, Myagdi and Parbat.
Apple	Jumla, Kalikot, Mustang, Dolpa, Humla, Mugu, Rukum, Bajhang, Bajura, Rolpa, Dailekh, Solukhumbu, Bitadi, Darchula, Rasuwa, Sidhupalchowk, Gorkha, Manang and Dhading
Kiwi	Kiwi is the newly introduced fruit in Nepal. It has high market demand in national and international market. Higher hills of Kavre and Doka district has suitable climate for the production of this fruit
Pomegranate	Nuwakot, Dhading
Tea	Ilam, Jhapa, Panchthar, Dhankuta, Dolakha and mountain areas of Kaski.
Cardamom:	Ilam, Terhathum, Sankhuwasava, Bhojpur, Panchthar and Dhankuta
Coffee	Gulmi, Palpa, Arghakhachi, Syangja, Bhaktapur, Kavrepalanchowk, Baglung, Parbat, Kaski, Gorkha, Lalitpur, Nuwakot, Tanahun, Lamjung and Ilam
Arecanut	Jhapa, Morang, Ilam and Sunsari
Cut-flowers	Kathmanu, Bhaktapur, Lalitpur, Kavre, Dhading, Chitwan, Nuwakot, Makawanpur, Ilam, Dhanusa, Palpa, etc.
Vegetables	Dhading, Kavre, Nuwakot, Chitwan, Dhankuta, Peri-urban areas and highway corridors. If marketing facilities are provided irrigated areas in throughout the hills are suitable for off-season vegetable production
Vegetable seeds	Hills and mountains through out the country

Nepal is highly potential for commercial production of various fruits and other high value crops. Even a district can produce several types of crops. Different crops have various pocket areas in all the districts. If crops are commercialized in their pockets, higher production and profit is ensured. Policy makers, donors, researchers, extension workers and other personnel involved in agriculture development are suggested to promote commercial production in the aforementioned pocket areas for employment creation, food security and economic development.

MAJOR CONSTRAINTS

Despite of greater scope and potentiality there are various constraints for commercial agricultural production system, some of them are:

Subsistence farming: The conventional farming system in Nepal is subsistence type. Each farmer produced as per need in the family. From sustainable point of view growing all crops is important. For commercial production it should be specialized to particular crop. The scattered form of subsistence farming imposed a grater constraint in marketing of horticultural commodities. The volume of products is small and absence of consolidated marketing system in Nepal has been the great setback for export marketing. To change the present system of conventional production system to the commercial ones need development of courage, skill and knowledge about production technology. Education, training, exposure visits, crop or product insurance, subsidy and assured market may bring changes in the attitute of the producers.

Small land holding and fragmented land: Average land holding per family is very less in Nepal which is about 0.57ha/family. For commercial production, a large area should be brought under cultivation in a particular area. The concept of one village one product of the government is mainly focused to bring large area under production in a particular area. Bringing large area for production of a particular commodity in a locality facilitates easy marketing. Collective and combined cooperative marketing is possible if a large area for a particular crop is brought into cultivation. Infra structures and facilities can be extensively utilized for many producers. The concept of growing separately and marketing collectively is possible. To be commercial the volume of production should be large. Creation of big production blocks is possible if appropriate government policies are made for renting the land in lease. There is need of land use policy. By adapting suitable land use policy the fragmented land can be combined and used for commercial production. For commercial production of fruits, vegetables and plantation crops large acreage should be brought under cultivation to produce enough volume for marketing.

Lack of systematic marketing system: Before planning production and establishment of enterprises one should think about the market and marketing of produce. Market information provides information to the growers about what crops to be grown, when to grow and where to sell. In Nepal, most of the government of non government organization encourage farmer to grow vegetables, fruits and high value crops without sustainable market and marketing system. Productions planning without market create embarrassing situations to the growers and discourage production. Previous planning of the government to grow fruits in the hills and mountains without transportation facilities has created problems to the producer. Often producers could not get market for their produce. These were the cases held in Mustang and Jumla for the promotion of apple. To be a commercial producer we should think and plan market before initiating production. Producers should know exactly when his crop is going to be produced and where is the market. There is slang that "one eye of the farmers should be in the field and other eye to the market". The development of proper market information system would prove to be beneficial to the farmers as they would be able to access the market demand, price and potential market for their produce. Market information can be obtained from net working, communication, television, radios etc. Previous year's market supply and price gives information to predict the tentative price and demand in the market.

Physical structure: Mountains and hills are more vulnerable in the physical, economical and social contexts than the plains because of constraints imposed by their inaccessibility, marginality and fragile land. Diversified climate in niche area in the hills and mountains provides opportunity to produce various high value crops. Economic opportunities may arise if value is added to the products and supplied in the market. Certified organic products can receive a premium price over no certified products provided that market for them exists.

Lack of physical infra-structure: In developing countries like Nepal, marketing is more problem than the production. Production has become easy as because this is the customary practices of many farmers and at the same time there are various organizations supporting for the promotion of production. In many intendances some of the projects boosted production of vegetables in some remote areas by providing financial support and inputs to the growers, but upon the termination of projects there is discontinuation in production and only a very few continue. In remote areas inaccessibility to the road is the major problem to produce horticultural commodities. In all most fruits the production is seasonal in nature. The production areas are in the remote areas and the bulk of production is confined to a particular limited time. Often storage and processing are essential to ensure better price and market guarantee. For export market quality of the product. should be given due consideration which needs cleaning, grading, sorting, fumigation, waxing and other packing house operations. In many instances, inferior qualities are processed to different product such as juice, jam jellies and beverages. Development of road and infrastructures and processing industries facilitates production of fruits and high value

commodities. In some crops production without processing is useless such as coffee, tea etc. In the past few years along with the development of roads the production of horticultural commodities has boost up. A few collection centers and agriculture product market háve been established in major production areas and that has aroused the interest of farmers to become commercial producers. Because of grwong transection the size of existing market has squeezed and is not enough. Further establishment of market along with other facilities will certainly enhance production at commercial level.

Lack of technical know-how: Ordinary growers usually have the knowledge of producing crops. To be a commercial, the producers should also have the knowledge about the physiology of his produce, its potential shelf-life, postharvest loss during transportation and handling, storability, probable increase in price after storage, grading, sorting, packaging and some other special treatments. Value addition is one of the important aspects for efficient and effective marketing. For export various treatments may be necessary for value addition and quality maintenance. Lack of know how about improved technology and postharvest handling practices the quality of product will be inferior and cannot compete in the market. Education, training and exposure visit to the producer is necessary to acquaint with commercial production, management and marketing of produce. The cost of indigenous product is always higher than imported ones because of higher cost of production.

Higher cost of production: In Nepal, the cost of production is always higher compared to India, China and many other countries as because it has to depend on other countries for inputs. Fertilizers, pesticides and other inputs have to be imported from other countries and cost is always higher as a result the cost of the product becomes higher. In addition, because of hills and mountains the cost of transportation also becomes higher. As per the policy of World Trade Organization (WTO) and market liberalization it is not possibele to ban import of agricultural produce from other countries. High quality fruits and vegetables in the market arrive from other countries relatively at lower price. Local producer and domestic product could not compete with the imported commodites in the market we can take the example apples and banana.

STRATEGIES

The government of Nepal has made continuous efforts to promote agriculture commercialization. Further more considerations should given to the following

Development of pocket areas for specific crops: The country has various agro-climatic conditions suitable for producing different crops. All the crops cannot be grown successfully in all the places. Identification of pocket areas in different location with policies and guidelines will facilitate combined or cooperative production and assurance of marketing of the produce. Government of Nepal has already identified suitbale pocket area for different crops and high value commodites. The major pocket areas for specific crops are already listed above under the heading of climate and crop.

Developmen of transportation facilities: Smooth transporation facilities should be developed to the production pockets. Fresh horticultural commodities are perishable in nature and postharvest loss is very high if transported and handaled roughly. In developed countries fruuits, vegetables and flowers are transported in refrigerated vehicle. These commodities are living even after harvest and continue respiration and other physiological activities. If stored and transported at lower temperature the physiological activites will be lowered and shelf-life will be increased. For transportation besides roads, the gravity ropeway technology also helps to reduce mountain inaccessibility.

Development of market: Market should be kept in the center point to promote production. Before planning production first we have to think about marketing of produce. Fresh agricultural produce cannot be kept longer as they deteriarate faster due to respiration, transpiration, ethylene production and rotting. Market linkage from production point to consumption point is very much essential. Producetion of fresh perishable commoditeies should be planned as per the market demand. There is immediate need to develop export market near the port having all the facilities like; precooling, packaging, grading, sorting, fumigation, certification etc. Government has already established some agriculture markets and needs further expansion in the future. In the main center big market should be establised having all the facilities such as; cold storage, refrigerated vehicles, packing house, processing industries etc.

Development of storage facilitities: Most of the horticultural products are seasonal and perishable in nature. During the production peak supply is glut in the market and price is low, while during off season there is scarcity and price is very high. For regular supply and stabilization of price storage is necessary. Construstion of big storage structures near the production centers and in the city is necessary to store produce and to regulate continuous suppy.

Establishment of processing insustries: There is always variation in the quality of produce. Usually superiior qualities are exported, medioum qualiy go to domestic market and inferior qualities are processed. Fruit which are inferior in quality can be processed to jam, jellies, juice, beverages, citric acid, pectins etc. Establishment of processing industries near to the production pockets encourages growers for commercial production. We can refer the example of himanchal pradesh, India where, horticulture development has been achieved with the coordinated approach of production, storage, processing, transporatation and marketing. Some of the agriculture products need primary processing to facilitate marketing. The primary processing operations often called as packing house operation; these are sorting, grading, cleaning, , waxing, chemical treatments, fumigation and packaging. These kinds of facilities in the collection centers or local market facilitates ensures better marketing of the produce.

Provision for export: Nepal can produce exportable agricultural goods such as cardamom, tea, coffee, ginger, fruits, cut flowers and foliage plants. Export of these commodites can be promoted by government agreements with other countries as well as providing support and encouraging enterpreneurs to export. Development of certification system as per the internation sanitary and phytoenitary rules is the immediate need.

Crop insurance: Most of the crops have long gestation period. Farmers have to wait long time after sowing or flowering to get harvest of the crop. The production is dependent on agro-climatic condition. Sometimes heavy rain fall, draught, hailstorm, disease, and other natural calamities may create serious problem and los to the crop. Because of high risk involved in commercial production of crops, farmers usually orient to subsistence cropping system for the security of food. To encourage farmers for commercial production there should be provision of crop insurance and minimum price guarantee.

Development of high yielding varieties: Most of the crop varieties grown in the country are indigenous type and produce fewer yields. By introducing/developing high yielding varieties yield can be increased to many fold. High yielding fruits, vegetables and other crop varieties should be introduced and there should be access to farmers. Kiwi is one of the internationally important fruit has been introduced recently in the country. Various seedless varieties of citrus, astringency less persimmon dwarf and low chilled varieties of apple, regular bearing varieties of mango and dwarf varieties of papaya fruit have been developed. Yield of vegetables can be increased by introducing hybrid varieties. There should be continuous research to monitor and improve the yield and quality of fruits, vegetables and other crops. There is great potentiality to increase the yield and quality of fruits in Nepal.

Arrangement of loan: Majority of the farmers grow conventional cropping system to solve their hand to mouth problem. Cereals are the major crops though out the country as because food security is the major concerns. If we consider yield and economic returns per unit land, fruits, vegetables, flowers and other cash crop give higher net return per unit land. Farmers usually are reluctant to grow such crop because, some of them have high gestation period, need market for selling and need high initial investment. To encourage commercial production, there should be provision of loan from the government.

Land use policy: For commercial production a large area should be brought under cultivation of a particular crop such as; tea, fruits, vegetables etc. If production is confined in particular area marketing is easier. Disperse production creates problem for marketing, marketing cost becomes very high and, volume for marketing is insufficient. All the land owners in a particular area may not be interested to grow similar crop, hence it is necessary to create artificial blocking of land from different owners which is only possible by taking the land on lease for a particular duration. For this it is possible by developing land use policy by the government. Various postharvest operations, processing and marketing becomes easier and effective if large amount is produced within a particular place.

Supply of inputs: For most of the inputs we depend on other countries. In many instances, fertilizers and other inputs are not available in time. There should be provision to supply inputs at the proper time.

Education and Training: Adoption of new technology needs specialized education and training. In Nepal the well trained manpower are not enough. There is need of high-tech agriculturist to boost production. High density planting, drip-irrigation, water harvesting technology, off season production, year round production, high quality production should be the major concern for commercial agriculture. To update recent knowledge about the new technology farmers or producers should have direct access or linkage to the university or research stations.

Subsidy and/or grant for the structural development: It has already been mentioned in the above text that the agriculture production in Nepal is expensive than China and India. To encourage Nepalese producer to become commercial they should be supported either by providing subsidy in the inputs or some grants in the machineries, equipments, engines, irrigation pipe, tools, construction of storage and packing house etc. etc.

Allow Foreign Investment: Commercial production and processing in large scale needs big investment which is beyoond the reach of many Nepalese people. Moreover the production should be market oriented. It should be linked with the importing countries. Foreign investor should be allowed to establish export oriented processing inductries such as coffee processing industries, fruit and vegetable processing industries etc. Poor econmic status of Nepales people cannot support big projects of commercial prodution and processing. Establishment of inducstries, creation of market and storage will facilitate and support for commercial production, create emplyment opportunities and earn foreign currency. The government has to made policy for the assurance of investors.

Realizing above facts, an integrated package is necessary to promote commercial production of agriculture in Nepal.

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