Final Report

National Industrial Strategy to Promote Domestic Production and Consumption of Agricultural and Pharmaceutical Products

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NPC

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Abbreviations Used

APPON	Associations of Pharmaceutical Producers of Nepal
CASA	Commercial Agriculture for Smallholder and Agribusiness
CBS	Central Bureau of Statistics
DDA	Department of Drug Administration
DDC	Dairy Development Corporation
DoI	Department of Industry
DoLS	Department of Livestock Service
Fig	Figure
GDP	Gross Domestic Product
Ha	Hector
ICOR	Incremental Capital Output Ratio
IDR	Import Dependency Ratio
KG	Kilo Gram
KM	Kilo Meter
MoALD	Ministry of Agriculture and Livestock Development
MoF	Ministry of Finance
MoFAGA	Ministry of Federal Affairs and General Administration
MoH	Ministry of Health
MoICS	Ministry of Industry, Commerce, and Supplies
MoPIT	Ministry of Physical Infrastructure and Transportation
MSME	Micro, Small, and Medium Enterprises
MT	Metric Tonne
NARC	Nepal Agricultural Research Council
NRB	Nepal Rastra Bank
SSR	Self Sufficiency Ratio

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Many private sector organizations and their representatives such as the Presidents, Chairman, Managing Directors, General Secretary, Executive Directors, Directors, Grace Pharmaceuticals (Ayurvedic), Rupendehi, Pharmaceutical Producers of Nepal, Innovative Pharma Lab, Medicines Importers Association of Nepal, Food and Agricultural Campaign, Nepal Tea and Coffee Development Board, Trade Promotion Center, Nepal Dairy Science Association provided us substantial data/information supportive to the analysis of this study.

05 July 2023

Study Team

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Executive Summary

Government of Nepal has announced the industrial sector's policy and programme for FY 2077/78 for the long-term sustainable growth of the industrial sector. This includes promoting and subsidizing industries that contribute significantly to export, developing infrastructure in Special Economic Zones (SEZ), re-opening sick public enterprises in the public-private partnership model, promoting/processing of agricultural and forest products, maximizing the utilization of domestic raw materials particularly for agricultural products, and bringing interventions through MSMEs. Nepal Government has also published guidelines for promoting public enterprises to use domestic resources.

The promotion of agricultural and industrial activities does have immense scope of expansion so long as they are integrated to the global markets. Government of Nepal has enlisted the top 20 import commodities that share about 62 percent of the total import. Next to petroleum products (13.2 percent of the total import for the first six months of the FY 2021/22), other major importable could be categorized into six major blocks: a) trade and industrial input commodities such as transport equipment, machinery parts, electrical equipment, computer and parts, and coal, b) medicine, c) food products such as crude oil – soybean and palm, rice, lentils and vegetables, d) luxury goods such as gold and silver, e) clothing related commodities blocks: such as thread, textiles, readymade garment, and f) hardware related commodities such as hot rolled sheet in coil, M.S. Wire Rod, Bars, Coils, Bars.

Recently some changes are apparent in Nepal's international trade. COVID-19 pandemic caused the decline of overall merchandise import thereafter it rebounded. However, due to the significant shrinkage in the foreign exchange reserve, the import control of luxurious goods resulted in some improvements. In the FY 2020/21, merchandise export increased by 44.4 percent to Rs.141.12 billion compared to an increase by 0.61 percent in the previous year. Likewise, the merchandise imports increased by 28.67 percent to Rs.1539.84 billion compared to a decline by 0.61 percent a year ago. Improvement in exports was mainly in palm oil, soybean oil, polyester yarn and thread, woollen carpets, oil cakes, among others. The improvement in the trade performance was also due to the decrease in the import of M.S. billet, chemical fertilizer, cement, pulses, molasses sugar, among others. Despite these improvements, the export of cardamom, tea, wire, toothpaste, copper wire rod decreased in the review period and the imports of petroleum products, medicine, crude palm oil, other machinery and parts, gold, among others could not decline.

The Government of Nepal has given priority to the promotion of agro-products for export. To achieve the national goal of high and sustainable production, productivity, as well as an equitable distribution of national income, the 15th Plan sets out strategies for making agricultural development competitive, sustainable, and export-oriented. Agribusiness, herbs, and tourism are among the sectors/activities with comparative advantages that will be developed and

increased. Additionally, exports will be promoted by increasing the production of goods and services that substitute imports. Along with the control of unproductive imports, agricultural and industrial goods such as pulses, oilseeds, fruits, shoes, cement, garments, and iron are required to increase the level of domestic production to meet the growing domestic demand. Furthermore, the 15th Plan has given priority to setting legal provisions to discourage the import of low-quality final consumption goods and services.

In this backdrop, overall objective of this assignment is to explore strategies how to reduce the trade deficit of Nepal, taking the special case of the agricultural and pharmaceutical products along with the increase of their domestic production and consumption. The strategies are not only to raise output volume but also to improve competitiveness in both the domestic and international markets.

Objectives and Scope

The specific objectives of this assignment are to prepare national industrial development strategies to promote domestic production, consumption, and export with due consideration of the following aspects:

a) to improve present domestic consumption pattern by substituting foreign products with domestic products,

b) to prepare strategy and action plan to promote production and domestic consumption of agricultural, and pharmaceutical products, and

c) to gradually decrease trade deficit through import substitution and export promotion of agricultural and pharmaceutical products.

During the last 10 years, major importable products (the top 20) have been changing. In the case of the wide variation, we have taken the reference of the most recent years. Following this rule, the study team has prepared a list of the agricultural products selected for the purpose of this study. They were paddy/rice, wheat, maize, cumin seeds and peppers, fruits, live animals, raw cotton, sugar, tea, tobacco, vegetables, garlic, wheat products, betel nut, crude palm oil, crude soybean oil, edible oil, palm oil, power milk & dairy products, and raw wool.

Likewise, the study has included the trade of the pharmaceutical products broadly classified into six major groups: capsules, tablets, liquid, ointment, powder, and eye/ear drops.

Methods

The study comprises three major components: situation analysis, preparation of action plan, and development of industrial strategies with reference to agriculture and pharmaceutical sectors. It uses a series of indicators pertinent to the production, consumption, and export of major agricultural and pharmaceutical products.

The study primarily uses secondary data from Department of Customs, Monitoring and Evaluation Division of the Ministry of Finance, Ministry of Industry, Commerce, and Supplies, and Ministry of Agriculture and Livestock Development. Likewise, other data sources are Nepal Rastra Bank, Trade and Export Promotion Centre, Department of Drug Administration, and NSO (previously CBS) for National Industrial Census of 2018 and before. Furthermore, the study team members also conducted in-depth interviews with the officials in the Ministry of Agriculture, Ministry of Finance, and the Ministry of Industry, Commerce, and Supply. Likewise, consultation with the officials in the Department of Drug Administration also provided substantial information and insights in conducting this study.

The national industrial strategies have been prepared for three different periods: short-term (1-3 years), medium-term (3-10 years), and long-term (10-25 years) that is conducive to import substitution and export promotion of Nepal's agriculture and pharmaceutical products.

Development of the short-term strategies are based on the existing productivity level of different crops. More specifically, agricultural yield with high domestic demand and high land productivity are to be promoted in the short-term. Strategies also associate issues on backward and forward linkages for their sustainable growth.

Medium-and long-term strategies have focus to the products that have limited domestic demand, higher export potential but do have lower land productivity. The products that satisfy two out of three conditions mentioned above have been addressed by medium-term strategies and those produce that have all three characteristics will require long-term industrial strategies to their growth, domestic consumption, and export.

Proposed Agricultural and Industrial Strategies

Short-term strategies

Vegetables

Poor information chain and market connectivity need to be addressed, particularly in case of vegetable and fruit products because of their perishable nature. Use of technology might help in this regard, i.e. cell phone networking between producers' and wholesalers' groups would make symmetrical inflow of information in both demand and supply sides and the role of mediators would be minimized.

Horticultural subsidies in India needs to be taken into consideration for subsidies in Nepal as well. Subsidies to the agricultural producers for the establishment of cold-storage system need to have government's technical support for the monitoring of temperature and humidity in the cold storage system. District and local Agricultural Knowledge Centres can contribute to address this need. Furthermore, agricultural, industrial and resettlement plans need to be harmonized

especially in the fertile valleys of Kathmandu, Chitwan, Dang, etc. for the protection of lands for vegetable production.

Nepal's seed dependency for vegetable crops is nearly 95 percent. Import of hybrid seeds should be controlled to the extent possible in order to control long-term negative impact on land productivity. Local seeds need promotion based on research and innovation.

Livestock and dairy products

Establishment of dairy management information system to cover input, production, and market chain is essential. In this regard, establishment of National Dairy Marketing Intelligence Platform (NDMIP) and Local Dairy Marketing Intelligence Platforms (LDMIP) are required to discuss and interact/exchange business performance and experiences among the stakeholders. This strategy is crucial for enhancing dairy sector performance.

Animal Feed alone stands around 64% of total cost required for animal husbandry. High cost of production, and uneven market access (only limited number of farmers have easy access to big milk processors) are key challenges in production and marketing of animal feed and dairy products. Domestic industries producing animal feed are required. Market access strategies differ among products and across region. They need exploration by separate and detailed studies.

Medium-term strategies

Cereal crops: Fixing minimum support price should be by the local government and this should apply throughout the country. The major objective of this strategy will be making the country self-sufficient in meeting the overall rice consumption demand of the country. *Marshi, Pokhareli, Jetho Budho, and Jorayel Basmati* are some of the high demand indigenous paddy varieties with higher potential for increasing production and productivity. Besides, indigenous seeds are eco-friendly having better nutrients. Thus, in collaboration with local governments, promotion of indigenous seeds needs to be in priority of the federal government. Furthermore, it requires to have acquired intellectual property right by Nepal.

Ministry of Agriculture and Livestock Development, Nepal Agricultural Research Council, University of Agriculture and Forestry should be brought under the same umbrella for research and collaboration. Avoiding duplication of work and promotion of improved technology for higher productivity deem necessary from their collaboration.

Fruits: High Hills, Mid Hills and Terai should specialize on the commercial production of 2--3 fruits in each of these geographical regions. One Village One Product campaign should have consolidation to avoid market fragmentation; therefore, intensive production scheme with export potential of limited fruits deems necessary; rather, based on the level of annual

production, the efforts should be in forming pocket, block, zone, and super-zone for different fruits.

Agricultural technicians in the public sector working in district and municipality level should work longer in the given jurisdiction for their familiarity of climatic conditions and adaptation of plants and livestock in the given environment so that they can provide better services to the farmers. Frequent transfer of them erodes this possibility.

Fertilizer: Nepal imports approximately three hundred billion Rupees worth of fertilizer, technology and agricultural equipment each year that have caused high cost of agricultural products. This needs gradual control. The subsidies need to domestic producers so long as the scope of domestic production exists to compete with imported fertilizer, technology, and agricultural equipment. In farm management, scientific use of wild biomass energy and municipal waste as an organic fertilizer deem necessary. Transfer of technology for cost-effective production of these organic fertilizer could enhance agricultural production and productivity.

Long-term strategies

Establishment of Land Bank in collaboration with local government was a good initiative of the government initiated through the budget speech of the FY 2019/20; however, it did not get momentum. It is expected to utilize the barren land suitable for cultivation. Alternative to land bank, co-operative farming is also very useful strategy where lands are fragmented and farmers are small holders. Co-operative farming can pursue collective cultivation, harvesting, and marketing their products. Moreover, farmers can buy seeds, fertilisers, and machines such as tractors, harvesting and thrasher machines, etc. for common use. This strategy has dual benefits, minimization of risks and utilization of marginal lands.

Government of Nepal has brought Reintegration Programme Directive for Returnee Migrants 2022 with an objective of creating space for the migrant workers where they can utilize their experience and knowledge optimally; however, such initiatives are not yet in process on behalf of the government but should be linked with the industrial strategies and promotion of agricultural activities. Likewise, Objective 7.5, clause 8.18 of the Industrial Policy 2067 has envisaged the establishment of an effective institution to facilitate acquiring intellectual property right; this should appear soon.

Role of Nepalese diplomatic missions abroad should work attracting foreign investments in specific industrial activities with the prospect of technology transfer, employment generation, and utilization of local raw materials. Although property registration and issuing bank credit is relatively easy in Nepal, the lending interest rate is quite high and discouraging investment. This applies to agricultural and pharmaceutical industries as well. Bank lending interest rate on industrial activities should be lower than that in trading activities and this difference should prolong.

Proposed industrial strategies for pharmaceutical products

Expenditure on research and development is very minimal in Nepalese Pharmaceutical industries compared to foreign companies. This is causing continuation of the import of pharmaceutical products for reliability even if the substitute Nepali products are available in the market. It is recommended to have a legal provision of making about five percent of their total annual turnover on research and development at the beginning and periodic growth thereafter.

Nepal Medicine Policy 2007 allows collaboration between Nepali and foreign companies to co-work for pharmaceutical sector. For attracting FDI, letting foreign companies establish pharmaceutical companies in Nepal, creating favourable environment for Nepalese companies to collaborate with reputed companies around the world are some key strategies that will be conducive to export of medicine from Nepal. Foreign Investment and Technology Transfer Act 2019 has the provisions of direct establishment of industries and transfer technology to them in Nepal. This provision can be instrumental for attracting FDI in this sector.

Provision of positive effective rate of protection to pharmaceutical products is warranted to ensure that the country has adequate value addition in the final products. However, the tariff rate to the raw materials for pharmaceutical industry is considered high whereas to the packaging materials very low (13 vs. 1), which is discouraging the import of raw materials. Only nominal positive effective rate of protection arising from the import of intermediate products would be an effective strategy. Nepali pharmaceutical industries have high tax burden, i.e. custom and excise duties in importing raw materials, packaging items, industrial equipment and technology, as well as VAT in sales and income tax on top of that demotivate them to increase production. The tax policy, therefore, requires revision. Furthermore, Nepali drug companies have to pay 1500 USD as a registration fee to central drug laboratory of India for getting export permission while Indian companies pay only 50 thousand in Drug Administration to export medicine in Nepal. GON should work for making them equal.

Overall, latest Doing Business Index (DBI) for Nepal shows that registration for the industry, registering the property, and getting credit is relatively easier in Nepal; however, doing business and paying taxes are quite difficult in Nepal. Service delivery of the government regarding this should be simplified.

More than one-third of drugs produced in India do not meet the minimum standard; a significant part of this is sold illegally. This alarming picture shows that Nepal (especially the Terai region) has become the hot spot for illegal drug supply. Ministry of Industry, Trade and Supply (especially Department of Industry) should make joint monitoring team with Nepal Drugs Limited for periodic market survey to control this problem. Safeguard, Anti-Dumping and Countervailing Act 2019 needs effective implementation; this has become more crucial now.

Public hospitals should have a directive to prescribe Nepalese pharmaceutical products even if the prices of them are upto 10 percent higher compared to the imported products so long as the qualities of the former are controlled.

1. Introduction

1.1 General background

Agriculture is the mainstay of the Nepalese economy, providing a livelihood for almost two-thirds of the population but accounting for about one-fourth of the GDP. Achieving self-sufficiency in food production for food security not only contributes towards self-sufficient economy but also to improve foreign currency reserve through import substitution of agricultural and essential goods. Nepal's industrial activity primarily involves the processing of agricultural products including pulses, jute, sugarcane, tobacco, and cereal products.

The 15th Plan aims to shift major contribution to GDP from agriculture to the industrial sector. Should the envisaged growth performance is achieved during the 15th Plan period (2019/20 to 2023/24), agricultural contribution in the GDP is estimated to decline from 27 percent to 22.3 percent, the share of the industrial sector will increase from 15.2 percent to 18.8 percent of the GDP; the service sector contribution increase from 57.8 percent to 58.9 percent during this plan period. Along with this structural change in the economy, a big chunk of the workforce is expected to transfer from agriculture to industry and service sectors. Although approximately two-thirds of the population was dependent on agriculture at the beginning of the 15th Plan, this is expected to decline to about 20 percent in the Fiscal Year (FY) 2043/44. If this structural transformation could materialize, it will help in reducing the disguised and structural unemployment in the agriculture and improve the productivity of agricultural labour.

Over the last decade, contribution of industrial sector in the GDP has declined from about 14 percent to 12 percent of GDP. The contribution of the manufacturing industry to the GDP is still very low and volatile; it reached 3.85 percent in FY 2020/21 from 8.57 percent in FY 2019/20, 6.52 percent in FY 2018/19, and 16.83 percent in FY 2016/17. The recent decline in its share in GDP was due to the impact of COVID-19 pandemic that caused many industrial establishments closed and many others run below their full potential (CBS, 2021).

According to the National Economic Census of Nepal 2018, Central Bureau of Statistics (CBS), of the total economic establishments -- 923,356 -- manufacturing establishments make up 11 percent which is close to 16 percent of overall employment in the country. Nearly 98 percent of manufacturing establishments are small units, whereas 1.6 percent are medium-sized and 0.7 percent belong to large scales in terms of the number of persons engaged.[1] Likewise, Small, medium, and large manufacturing establishments employ respectively 53, 13, and 34 percent of the total number of persons engaged in the manufacturing sector (Kharel and Dahal, 2020). Moreover, in terms of investment, cottage, small and medium scale industries share 34.07 percent of the total investments and provide mass employment i.e. 95.56 percent in comparison

[1] Small firms have less than 20 persons engaged, medium-sized firms have 20–99 persons engaged, and large firms have 100 or more persons engaged.

to large scale industries (Department of Industry, Ministry of Industry, Commerce and Supplies, Government of Nepal, 2017).

Government of Nepal has announced the industrial sector's policy and programme for FY 2077/78 for the long-term sustainable growth of the industrial sector. This includes promoting and subsidizing industries that contribute significantly to the export, developing infrastructure in Special Economic Zones (SEZ), re-opening sick public enterprises in the public-private partnership model, promoting processing of agricultural and forest products, maximizing the utilization of domestic raw materials particularly for agricultural products, and bringing interventions through MSMEs. Nepal Government has also published guidelines for promoting public enterprises to use domestic resources.

The promotion of agricultural and industrial activities does have immense scope of expansion so long as they are integrated to the global markets. Government of Nepal has enlisted the top 20 import commodities that share about 62 percent of the total import. Next to petroleum products (13.2 percent of the total import for the first six months of the FY 2021/22), other major importable could be categorized into six major blocks: a) trade and industrial input commodities such as transport equipment, machinery parts, electrical equipment, computer and parts, and coal, b) medicine, c) food products such as crude oil – soybean and palm, rice, billet and vegetables, d) luxury goods such as gold and silver, e) clothing related commodities blocks: such as thread, textiles, readymade garment, and f) hardware related commodities such as hot rolled sheet in coil, M.S. Wire Rod, Bars, Coils, Bars.

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The Government of Nepal has given priority to the promotion of agro-products for export. To achieve the national goal of high and sustainable production, productivity, as well as an equitable distribution of national income, the 15th Plan sets out strategies for making agricultural development competitive, sustainable, and export-oriented. Agribusiness, herbs, and tourism are among the sectors/activities with comparative advantages that will be developed and

increased. Additionally, exports will be promoted by increasing the production of goods and services that substitute imports. Along with the control of unproductive imports, agricultural and industrial goods such as pulses, oilseeds, fruits, shoes, cement, garments, and iron are required to increase the level of domestic production to meet the growing domestic demand. Furthermore, the 15th Plan has given priority to setting legal provisions to discourage the import of low-quality final consumption goods and services.

The 15th Plan also emphasised to develop industrial zones, special economic zones, processing zones, and quarantine services to diversify spatial production activities and their access to export markets. Processing of agricultural goods and herbs, developing their export capacity, and simplifying the export business through economic diplomacy and market study, and promotion of processed agricultural goods and herbs are the agricultural strategies adopted in the 15th Plan. More specifically, 15th Plan further emphasizes identifying, developing, diversifying, and increasing the production and productivity of food grains and other consumer goods and services having comparative advantages and competitiveness. The Plan has focussed on protecting intellectual property right in international market and reduce the cost of domestic and international trade through development and utilization of trade technologies and other infrastructures, use and expansion of information technologies, good governance and effective regulation, trade facilitation, and institutional strengthening.

Despite these measures, the production, domestic consumption, and export of tradable have not improved over the years; rather deterioration is visible in these aspects. Nepal Government's common minimum programmes and associated policies endeavours to industrialization, downsize trade deficit through import substitution and export promotion of agricultural and industrial products. In light of this situation, this study commissioned by the National Planning Commission (NPC) intends to develop the industrial strategies for the agro-based and pharmaceutical products in the backdrop of 15th Plan policies, programmes and existing acts and regulations in Nepal. On top of the current 15th Plan, Nepal government has incorporated a 25-year-long-term vision as well. It has envisaged 10.5 percent average annual economic growth target, 5.5 percent for agriculture and 13 percent for industrial sector, respectively. The present study develops a scenario how to materialize this prospect with reference to the major 20 agricultural and pharmaceutical products.

1.2 Objectives of the assignment

The overall objective of this assignment is to explore strategies how to reduce the trade deficit of Nepal, more specifically to that of the agricultural and pharmaceutical products along with the increase of their domestic production and consumption. The strategies are not only to raise output volume but also to improve competitiveness in both the domestic and international markets. In this regard, the study is also to identify the primary agricultural production concerns, such as irrigation, competitiveness, market and product development, including other aspects.

The specific objectives of this assignment are to prepare national industrial development strategies to promote domestic production, consumption, and export with due consideration of the following aspects:

d) to improve present domestic consumption pattern by substituting foreign products with domestic products,
e) to prepare strategy and action plan to promote production and domestic consumption of agricultural, and pharmaceutical products, and
f) to gradually decrease trade deficit through import substitution and export promotion of agricultural and pharmaceutical products.

1.3 Scope of work

The scope of work of the study are as follows:

a. Trend of major (top 20) imported commodities with special focus to agricultural products such as crude soybean oil, rice/paddy, crude palm oil, edible oil and b) pharmaceutical product i.e., medicine
b. Production, consumption and trade of other agricultural products such as vegetables, fruits and eggs, meat and dairy products
c. Policy, acts, rules, and regulations related to industry sector such as Industrial Policy 2067, Industrial Enterprise Act 2076, Industrial Regulations 2078, Trade Policy 2072, Nepal Trade Integration Strategy 2073 and Industry sector programmes and strategies of Government of Nepal.
d. Domestic consumption pattern and government policy and programmes for promoting domestic products
e. Distribution of benefits from production
f. Problems and challenges in promoting production and consumption of domestic products
g. Import substitution and export promotion of listed goods with due consideration of LDC status, 15th Plan and SDGs
h. Policy barriers for agricultural industries and the policy changes required for overcoming those barriers
i. Impact of illicit/ illegal imports, including illegal exports and recommend trade and economic diplomacy for the effectiveness of policies
j. Current policies and provisions for industries stated in hindering their access to public resource, and any other provisions
k. Strategies to promote production of top 20 imported products
l. Mode of substitution of imports in the short-, medium- and long-term, significantly
m. Measures to promote industrial production, and domestic consumption of major importable with reference to policy reforms in specific crops, technology transfer, and/or protection measures such as subsidy in promoting pocket zone for major crops, fruits and vegetables

n. Comparative advantage of different agricultural products that has potential for import substitution and product diversification and measures to make it competitive advantage
o. Identification of absolute and competitive advantaged goods and services
p. Cost minimization strategy with reference to entire value chain of the agricultural and other products
q. Strategies to promote SMEs in agricultural and pharmaceutical products, and
r. Short term (1-3 years), medium term (3-10 years), and long term (10-25 years) action-plan to promote domestic production and consumption of agricultural and pharmaceutical products

2. Methods

The study uses a series of indicators pertinent to this study as guided by the Terms of Reference and mentioned in the scope of work in Section 1.5. The analysis on production, consumption, and export of major products will be with reference to these indicators. Moreover, the analysis will associate three different scenarios: pre-COVID-19 period, during COVID-19 period, and post-COVID-19 period. The implications will follow from this analytical framework.

2.1 Products under analysis

During the last 10 years, the top 20 importable products have been changing. Under these circumstances, we take the reference of the last five years. Even if there is wide variation in the list of products over the years, especially in case of agricultural and pharmaceutical products, we will take the reference of the most recent years. Following this rule, the study team has prepared a list of the agricultural products selected for the purpose of this study.

Top 20 agricultural products covered by this study are as follows:

1. Paddy/rice
2. Wheat
3. Maize
4. Cumin seeds and peppers
5. Fruits
6. Live animals
7. Raw cotton
8. Sugar
9. Tea
10. Tobacco
11. Vegetables
12. Garlic
13. Wheat products
14. Betel nut
15. Crude palm oil
16. Crude soybean oil
17. Edible oil
18. Palm oil
19. Power milk & dairy products
20. Raw wool

Likewise, the study has included the trade of the following pharmaceutical products in the analysis of Nepal's import substitution and export promotion of pharmaceutical products:

Aceclofanac, Alprazolm, Amlodipine, Amozycillin, Amoxycillin and clavuanic acid, antacid containing Aluminium, Magnesium salts, Anticold tablet(PCM Combination), Atrovastatin, Azithromycin, Cefexime, Cefodoxime, Cetrizine, Cough Preparation containing approved combination, Diclofenac, Diclofenac and dielthalamine, Diclofenac Potassium/sodium, Dicyclomine HCL, Drotaverine, Enzyme preparation containing approved combination, Escitaloprm, Fexofenadine, Flueconazole, Gabapentine, Hyoscine Butybromide, Indomethacin, Itopride, Itraconazole, Levocetrizine, Losartan Potassium, Mefenemic Acid, Metformin, Metformin and combination with Glimepiride, Metformin and combination with Sitagliptin, Metronidazole, Metronidazole +Diloxanide furoate, Multivitamins combination products, Nimesulide, Omeprazole, Oral rehydration salts containing approved composition, Ornidazole, Pantoprazole, Paracetamol, Paracetamol +Chlorozoxazone, Paracetamol+Ibuprofen combination, Pregabalin, Rabeprazole, Ranitidine, Rosuvastatin, Sitagliptin, Spironolactone and combination with frusemide, Telmisarton, Tinidazole, Tizanidine, and Semisolid Preparation. For the trade situation of these products, please see table in the Appendix.

2.2 Method of analysis

2.2.1 Data collection

The data collected from multiple sources are as follows:

1. Department of Customs
2. Monitoring and Evaluation Division of the Ministry of Finance
3. Nepal Rastra Bank
4. Monitoring and Evaluation Division of the Ministry of Industry, Commerce, and Supplies
5. Trade and Export Promotion Centre
6. Department of Drug Administration
7. NSO (previously CBS) for National Industrial Census of 2018 and before
8. Monitoring and Evaluation Division of the Ministry of Agriculture and Livestock Development
9. Agriculture Perspective Plan 2015 and Industrial Perspective Plan

Furthermore, the study also associates following data/information:

1. Import /export data of top 20 agricultural products, especially cereal crops, meat and eggs, fruits and vegetables for the last 10 years
2. Import /export data of major pharmaceutical products for the last 10 years
3. Industrial Policy 2067, Industrial Enterprise Act 2076, Industrial Rules 2078, Trade Policy 2072, Trade Integration Strategy 2073
4. सार्वजनिक निकायमा स्वदेशी बस्तुको उपयोग गर्ने सम्बन्धी निर्देशिका, २०७१
5. Kharel, P., & Dahal, K. (2020). *Small and medium-sized enterprises in Nepal: Examining constraints on exporting* (No. 1166). ADBI Working Paper Series.
6. The 15th Plan, NPC, Government of Nepal

In addition to these data/information, in-depth interviews with the officials in the Ministry of Agriculture, Ministry of Finance, and the Ministry of Industry, Commerce, and Supply will be conducted using the checklist as presented in the Appendix.

The study associates three major components: situation analysis of the major importable during the last 10 years, the preparation of the action plan to promote domestic production, consumption, and export of agricultural and pharmaceutical products, and the development of industrial strategies to these two sectors. It is expected to contribute for import substitution and export promotion of the country.

2.2.2 Situation analysis

The situation analysis will be basically a trend analysis comprising:

i. The period covered: 10 years (Fiscal year 2011/12 – 2021/22) and 2011/12 will be base year
ii. Products: top 20 importable
iii. Mode of analysis: pre-Covid (2011/12 – 2017/18), during Covid (2018/19 – 2020/21), and post-Covid (2021/22) situations
iv. Economic parameters: production, consumption, and export.

2.2.3 Preparation of the action plan

The study will prepare action plans to import substitution and export promotion with reference to three different periods: short-term (1—3 years), medium-term (3--10 years), and long-term (10--25 years). The Action Plan will have the following structure:

Step 1: Specification of the end goal

Step 2: Setting the policies and strategies

Step 3: Making the deadline

Step 4: Setting the milestones

Step 5: Estimation of the resources needed

Step 6: Provision of the mid-term review of the plan

Step 7: Monitoring, evaluation and update of the plan.

All three plans (short-term, medium-term, and long-term) will follow the structure given above.

2.3 Preparation of industrial strategies for agricultural and pharmaceutical products

The national industrial strategies have been prepared for three different periods: short-term (1-3 years), medium-term (3-10 years), and long-term (10-25 years) that is conducive to import substitution and export promotion of Nepal's agriculture and pharmaceutical products.

Short-term strategies: Development of the short-term strategies has been be based on the existing productivity level of different crops. More specifically, agricultural yield with high domestic demand and high land productivity are to be promoted in the short-term. Strategies also associate issues on backward and forward linkages for their sustainable growth.

Medium-and long-term strategies have focus to the products that have limited domestic demand, higher export potential but do have lower land productivity. The products that satisfy two out of three conditions mentioned above have been addressed by medium-term strategies and those produce that have all three characteristics will require long-term industrial strategies to their growth, domestic consumption, and export. Those addressed by long-term strategies basically require long gestation period to get the outcome.

3. Review of the Situation, Policies and Strategies

3.1 Review of Nepal's agricultural and industrial development

The growth performance of Nepalese economy is rather volatile for the last one decade due mainly to the impact of earthquake, trade barrier with India after the promulgation of the new constitution, Covid-19 pandemic, and Russia-Ukraine war. The growth rate fluctuated in the range of -2.4 to 9 percent (Table 3.1). Agriculture was the mainstay of Nepalese economy; however, its contribution in GDP has been constantly declining from 68.88 percent in 1974/75 to 33.15 percent in 2011/12 and 26.26 percent in 2021/22 but it still stands as a largest employer (64.5 %)[2] in the domestic economy.

Table 3.1: Growth and consumption trend in Nepalese economy

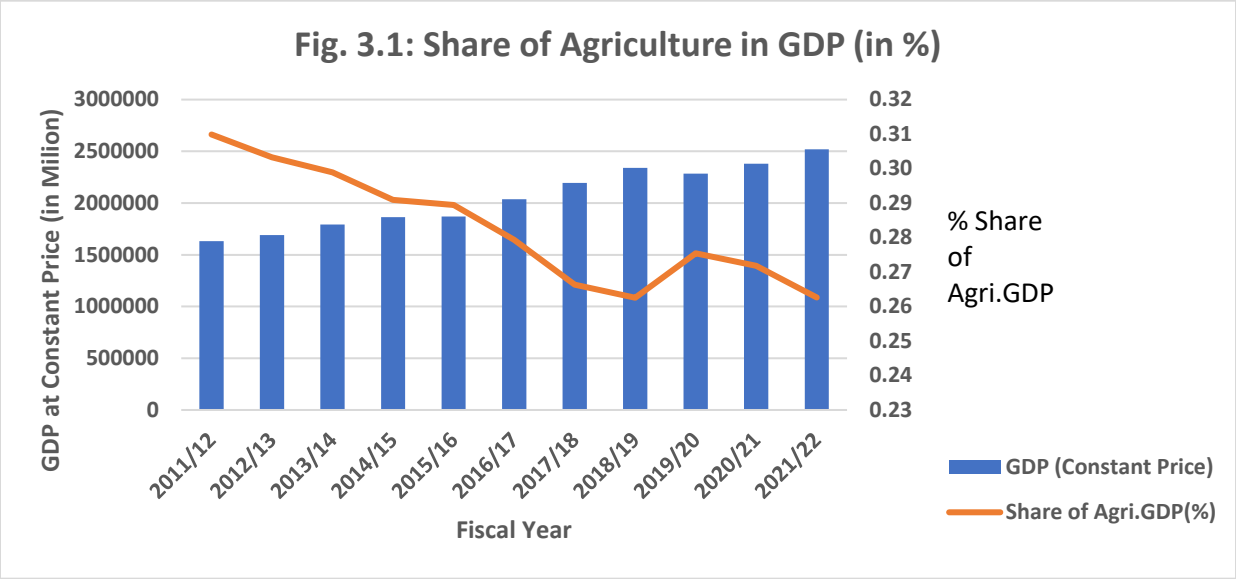
Fiscal Year	GDP (at Constant Price) (In million Rs)	GDP growth rate (in %)	Growth rate of Agricultural GDP (in %)	Consumption (% of GDP)
2011/12	163204.05			90.88
2012/13	168957.24	3.5	1.3	91.82
2013/14	179114.08	6.0	4.5	90.64
2014/15	186235.75	4.0	1.2	92.37
2015/16	187042.36	0.4	-0.1	96.36
2016/17	203833.67	9.0	5.2	87.02
2017/18	219370.64	7.6	2.6	85.21
2018/19	233974.27	6.7	5.2	84.7
2019/20	228429.97	-2.4	2.4	94.28
2020/21	238131.25	4.2	2.8	92.29
2021/22	252032.2	5.8	2.3	90.7

Note: Constant price of the fiscal year 2010/11,
Source: CBS, 2022.

The constant decline of the agricultural share in GDP has been presented in Figure 3.1. The sharp rise in the growth rate of agricultural sector in 2018/19 was because of the favourable climate

[2] Male employment 52, and female employment 74 percent, source: https://data.worldbank.org/indicator/SL.AGR.EMPL.FE.ZS?end=2019&locations=NP&start=2019&view=bar

along with increased access of agriculture related materials and services (fertilizer, seeds and irrigation). During the FY 2018/19, major agricultural production -- paddy -- grew by 8.9 percent (Economic Survey 2018/19). Sharp rise in the growth rate of paddy pushed the growth rate of overall agricultural GDP upward.



Source: Ministry of Finance, Dashboard data 2021/22.
Note: GDP series is at the constant price of 2010/11.

The share of agricultural GDP is not only declining over the years, the growth rate is also volatile that mainly causes the volatility in the overall GDP as well. However, during the Covid-19 pandemic, the growth rate of agricultural GDP still remained positive but the overall GDP growth rate became negative (Table 3.1) mainly due to the shrinkage of the non-agricultural activities.

Cereals contribute the most to the GDP sharing about 8.5 percent, followed by livestock with 6.41 percent, vegetables/horticultural activities with 6.1 percent, fruits/nuts/beverages with 1.7 percent, and fishery with 0.38 percent in the year 2021/22. However, major declines in the relative contribution of cereal crops, vegetable/horticulture, fruits/nuts/beverages in GDP are apparent during 2011/12 – 2017/18; thereafter, no significant changes are visible. However, the contributions of other activities such as livestock and fisheries have remained almost stable (Table 3.2).

Table 3.2: Share of agriculture, vegetable, fruits/nuts, livestock and fishery in GDP (%)					
Fiscal Year	**Cereals**	**Vegetables and horticulture activities**	**Fruits, nuts, and beverage**	**Livestock**	**Fishery**
2010/11	12	9.16	3.86	6.49	0.25
2017/18	9.72	5.58	1.3	6.52	0.4
2018/19	9.65	5.2	1.31	6.4	0.39
2019/20	9.61	5.5	1.4	6.42	0.43
2020/21	9.18	5.84	1.27	6.4	0.42
2021/22 (P)	8.34	5.9	1.27	6.23	0.44

Source: Department of Agriculture and Livestock, 2021/22.
Note: P refers to projected figure.

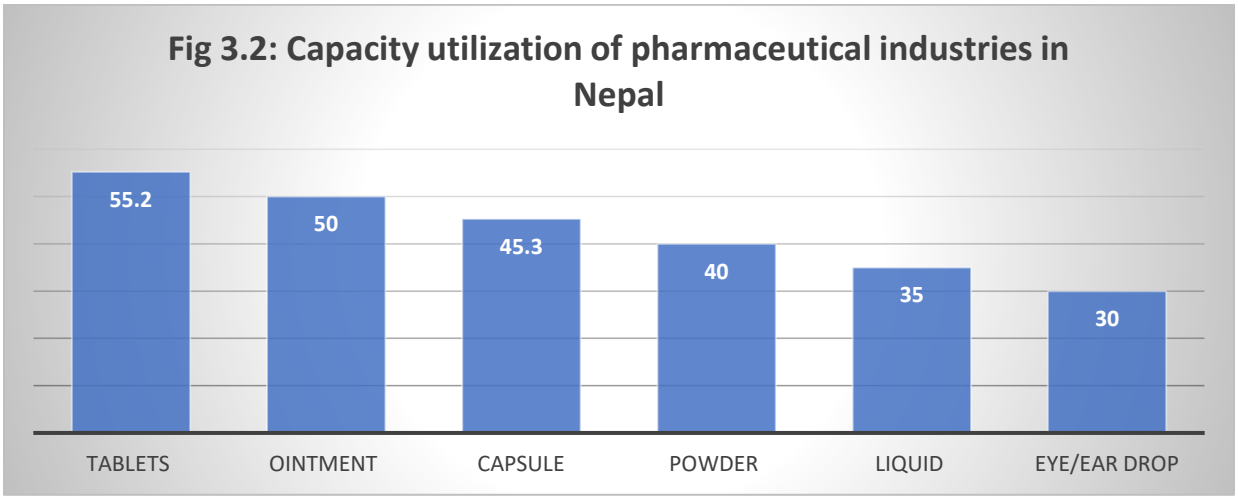
In cereals, paddy has the highest share in GDP (11.3%) followed by maize 6.8% and wheat 4.6%. Lentils and mustard seed have respective shares of 2.1 and 1.4%. Among vegetable, cash crops, beverages, fresh vegetables account for 16.67% of GDP, followed by potatoes 5.5 and sugarcane 1.3%. Among fruits, bananas and mangoes have the highest shares in GDP -- 1.3 and 2.5 %, respectively. Furthermore, dairy products (milk) share 6.2% in GDP followed by buffalo meat (4.4%) and goat meat (3.1%), (MoALD, 2022). Likewise, egg production is about 1.08 billion in number in the FY 2020/21 (Economic Survey 2020/21, MOF, 2022). In egg production, Nepal has developed its self-sufficiency.

Pharmaceutical Sector

By 2020/21, 103 pharmaceutical manufacturing industries have been registered in the Department of Drug Association, Nepal. Out of which, 72 industries are currently operating with manufacturing and marketing permission. Majority of the pharmaceutical manufacturers are concentrated in Bagmati Province that shares 56.06 percent of total domestic production of pharmaceuticals. The size of pharmaceutical industry in Nepal is about 0.04 percent of GDP for the FY 2077/78 (See Table A1 in the Appendix.)

Among the established pharmaceutical industries, 66 are tablet producer industries, 60 capsule producers, 45 liquid producers, 40 ointment producers, 20 dry syrup producers, and 5 eye/ear drop producers. They have the annual capacity of producing 2.06 billion unit of tablets, 1.87 billion unit of capsules, 4.5 billion units of liquid, 0. 15 billion units of ointment, 0.03 billion units

of dry syrups, and 0.0037 billion units of eye/ear drops (MoICS, 2021). However, Majority of the pharmaceutical industries are running below their actual capacity which is presented in Figure 3.2:



Source: MoICS, 2021.

3.2 Nepal's external trade in agriculture and pharmaceutical sectors

Nepal has been experiencing a long-standing import dominance in its foreign trade. The country's import-to-export ratio over the last ten years shows that import has swelled-up from six times to over ten times of the export. In the year 2017/18, it was highest, even more than 15 times (Table 3.3). Further, Nepal's export and imports are heavily dependent on India, which accounts for nearly two-thirds of its export and over three-fourths of its import on an average for the last one decade. Recent updates show that India accounted 77.5 percent of Nepal's total exports and 62.4 percent of imports last year. Likewise, China accounted for 0.4 percent of its exports and 13.7 percent of its imports. Export to other countries shared the remaining 21.99 percent of its total export, whereas the share of imports was about 23.7 percent (Nepal Rastra Bank 2021/22). A bird's eye view on Table 3.3 presents Nepal's trade performance for the last one decade including pre, during, and post-COVID-19 pandemic scenarios.

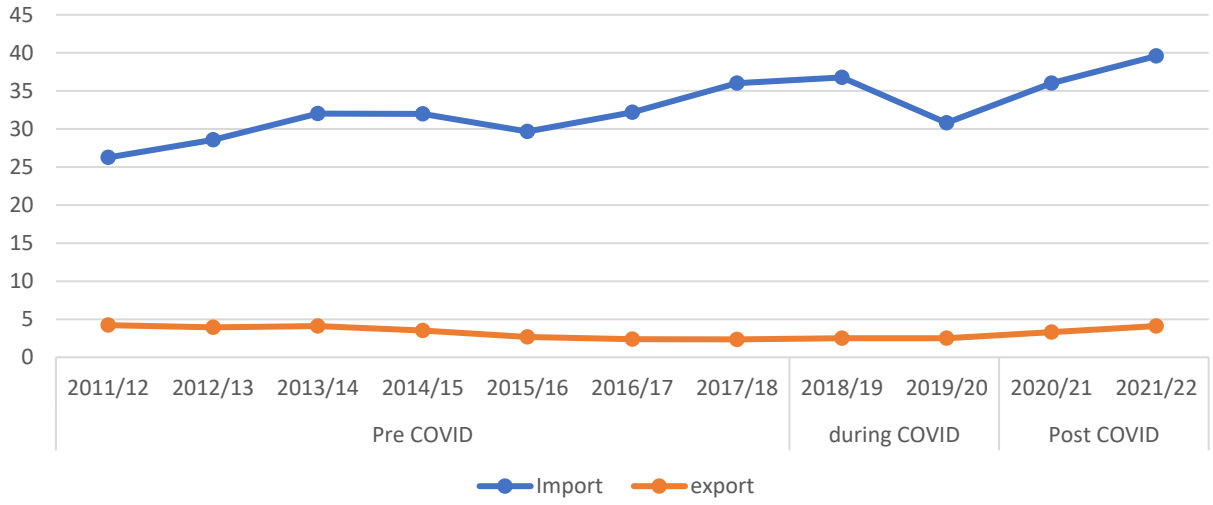
Table 3.3: Pattern of foreign trade (Rs. in Ten Million)

Study Period	Fiscal Year	Export (X)	Import (M)	Trade Balance (X-M)	M to X Ratio
Pre- COVID-19 Period	2011/12	7426.1	46166.77	-38740.67	6.22
	2012/13	7691.71	55674.03	-47982.32	7.24
	2013/14	9199.14	71436.58	-62237.44	7.77
	2014/15	8531.91	77468.42	-68936.51	9.08
	2015/16	7011.71	77359.91	-70348.2	11.03

	2016/17	7304.91	99011.32	-91706.41	13.55
	2017/18	8135.98	124510.32	-116374.34	15.30
During COVID-19 period	2018/19	9710.95	141853.53	-132142.58	14.61
	2019/20	9770.9	119679.9	-109909	12.25
Post- COVID-19 period	2020/21	14110	153980	-139870	10.91
	2021/22	20003	192044	-172041	9.60
Source: calculated based on data from Nepal Rastra Bank, online portal, 2022.					

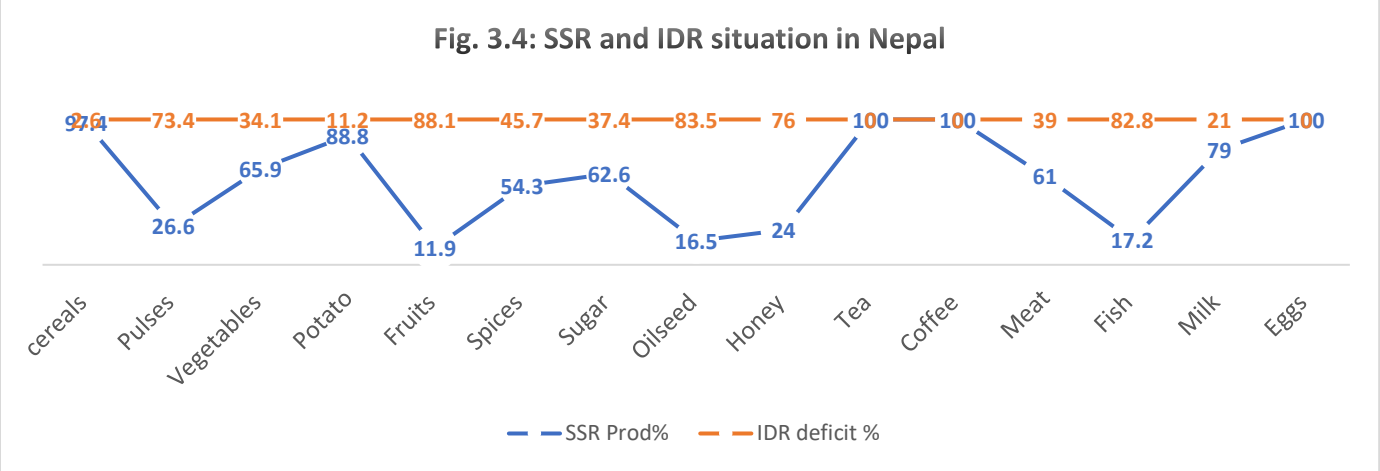
During the past ten years, Nepal has experienced huge trade deficit as shown in Table 3.3. import export ratio has now returned almost to the level of seven years ago, i.e. fiscal year 2014/15, due to the shrinkage in imports caused by the recent depletion of foreign exchange. The share of imports in the national economy is nearly 32 percent of GDP, whereas the share of exports is 3.49 percent. Although imports decreased slightly during the COVID-19 period, with reference to Nepal's GDP size, the overall trend of the growth of import and sluggish growth of export has remained almost unchanged during the last one decade.

Fig 3.3: Export and import as a percent of GDP



Note: Calculated based on data from Nepal Rastra Bank, 2022.

Food self-sufficiency ratio (SSR) of major agricultural product except tea, coffee and poultry eggs is below the average national requirement in Nepal. SSR of cereals in fiscal year 2017/18 was 97.4%, vegetable 65.9%, potato 88.8%, milk 79%, sugar 62.6%, meat 61%, spices 54.3%, fish items 17.2%, edible Oil 16.5% and fruits 11.9% (MoALD, 2022). The gaps are fulfilled by the imports; therefore, the Import Dependency Ratio (IDR) is rather high among various agricultural products (Figure 3.4).



Source: Calculation of SSR and IDR based on the data from MoALD, 2017/18.

The higher per capita consumption expenditure on food items coupled with less than 100 SSR has raised the space of import dependency of major agriculture products in Nepal. Nepal's import dependency ratio (IDR) calculated based on the data of 2017/18 shows that the IDR of certain commodities like fruits (88.1%), oils (83.5%), fish (82.8%), and pulses (73.4%) are very high (Table 3.4). Likewise, IDR of cereals, vegetables, and milk are 2.6, 11.2, and 21% respectively which directly hit the kitchen of Nepalese family (Pokhrel, 2020).

Table 3.4: IDR and SSR of agriculture products in Nepal

Commodity	Production (t)	Deficit/Surplus (t)	Total	SSR (in %)	IDR (in %)
Cereals	7252657	196440	7449097	97.4	2.6
Pulses	283500	782500	1066000	26.6	73.4
Vegetables	1874901	968248	2843149	65.9	34.1
Potato	2525022	318127	2843149	88.8	11.2
Fruits	1018308	7511140	8529448	11.9	88.1
Spices	66817	56183	123000	54.3	45.7
Sugar	284655	170251	454906	62.6	37.4
Oilseed	75058	379846	454904	16.5	83.5
Honey	3500	10715.75	14215.75	24	76
Tea	24409	+11700	36109	100	0
Coffee	203	+78	281	100	0

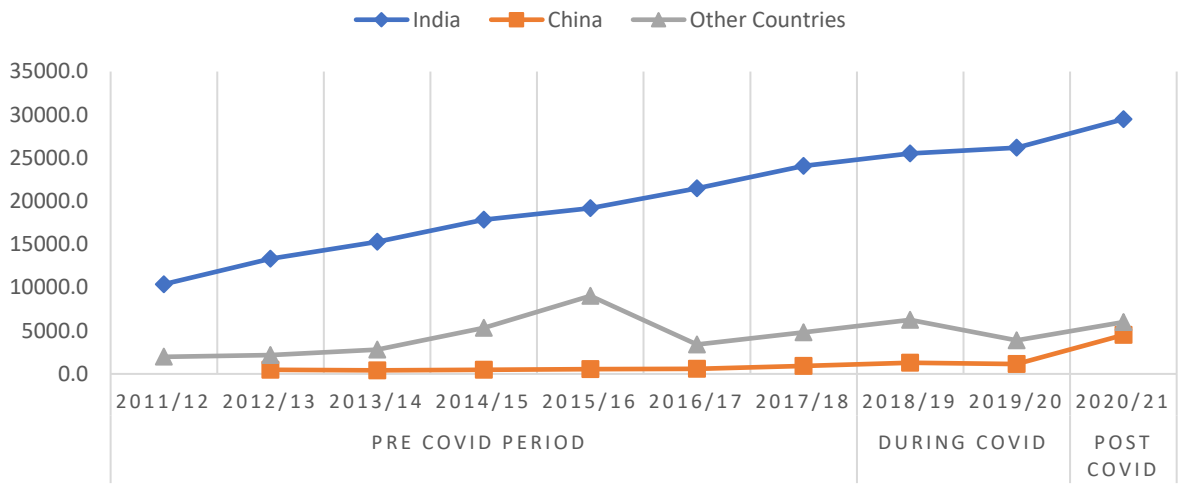
Meat	242900	155141	398041	61	39
Fish	53900	258846	312746	17.2	82.8
Milk	2045000	542266	2587266	79	21
Eggs	1470000000	+105288288	1.58E+09	100	0

Source: Calculation of Self-Sufficiency Ratio and Import Dependency Ratio of major agricultural crops are based on the data of MoALD, 2017/18.

Note: Values in tones; milk in kilolitres and eggs in number.

Pharmaceutical industries are heavily dependent with India for raw materials which is nearly 80%; import from China is about 15% of the total raw material import. Rest of the materials (5%) are imported from Australia, Thailand, Singapore, Spain, South Korea, Bangladesh and so on. However, primary and secondary packaging materials (Bottle & Cap, Blisters pack, Duplex, Labels) are all imported from India but tertiary packaging materials are purchased mostly from local /domestic industries. Nepalese pharmaceutical industries are currently fulfilling around 45% of total domestic demand but they possess the capacity of fulfilling nearly 75% of domestic demand if they utilize their full capacity. India alone occupies 50% of the Nepali market (APPON, 2022). Figure 3.5 presents the import of final medical products in Nepal during the past ten years.

Fig. 3.5: Status of medicine import in Nepal



Source: Nepal Rastra Bank, 2021/22. Values are in million Rupees.

3.3 Production and trade discourse as envisaged by the 15th Plan

The target annual average economic growth rate during the 15th Plan was 9.6 per cent and that of the agriculture, industry, and service sectors were expected to be 5.4, 14.6, and 9.9 per cent, respectively. The Plan has projected the share of agriculture in GDP decline from 27 to 22.3 percent and the trend during the plan period is following this trend. However, growth of the relative share of industrial sector's contribution in GDP is slower than projected, from 15.2 to 18.8 percent of the GDP. Consequently, a big chunk of the labour force dependent on agricultural sector would be transformed into the industrial and service sectors. However, the growth of the services sector is faster than expected and that of industrial sector is not only slower than expected but it is also fluctuating.

Nepal has been making long effort for encouraging the foreign investment along with technology that will help import competition and export promotion. Although this policy continues from the last several national development plans, the trade deficit is on the rise as the size of imports has been increasing in alarming rate whereas the exports of goods and services remain constant. The balance of payment situation of the country shows that foreign exchange reserve of Nepal is mainly determined by the size of imports and the inflow of remittances. The balance of payment situation of Nepal was in surplus in the past several years despite a continuous increase in trade deficit only because of the remittance income. Trade deficit in Nepal is more than one-third of its GDP and foreign remittance is more than one-fourth of GDP that mainly goes for financing the import; therefore, very small portion of Nepal's import is being met by its export earnings.

Nepal's external trade suffers with many problems. More than two-thirds of its trade is with India, very limited exportable items and they are mainly primary goods. Energy and tourism are two major export-oriented sectors but only very limited potential of them has been harnessed so far. Likewise, remittance income has not yet been linked with domestic production system but fuelling the import, therefore, foreign exchange reserve is the major challenge for Nepal's external sector. Several non-tariff barriers also exist in Nepal's external trade; they include limited ports available in India and China for transit and transportation. The country needs tremendous effort in exploring the potential to increase agricultural and industrial products and export them to developed countries including the neighbouring ones. Several decades ago, agricultural products dominated Nepal's export sector; thereafter woollen carpets and garments dominated the country's overall external trade. Currently, export of human resources is the major source to meet the merchandise trade deficit; therefore, skill improvement of the foreign employment of labour deem necessary for the increased inflow of remittances by enhancing skills and efficiency of migrant workers.

3.4 Review of current industrial policies/rules, industrial enterprise act and strategies

Nepal had its first industrial policy in 1957 and it was replaced by new policies in 1960, 1974, 1981, 1987, 1992 and 2010, respectively. Industrial Policy 2010 is more comprehensive compared to earlier industrial policies and it aims to enhance export of industrial goods, improve industrial sector's contribution to the economy by using local resources, make industrial enterprises sustainable through application of innovative and environment-friendly technology, make Nepal an attractive destination in South Asia for investment, and protect intellectual property rights of industries (Nepal's Trade Policy Review 2018, Ministry of industry, Trade and Commerce).

After the restoration of the multi-party democracy Industrial Policy 1992 was implemented with the expectation that this policy along with Foreign Investment and Technology Transfer Act 1992 will be supportive to strengthening industrial base of the country, impressive growth of the manufacturing sector, and transfer of significant chunk of labour force from agriculture to industrial sector. The industrial policy was rather liberal with several incentives provided to the investors. The country got Income Tax Act 2002 and several amendments made thereafter scrapped many of these incentives and industrial sector could not grow as envisaged. This caused the promulgation and enactment of new Industrial Policy 2010. This new policy is considered to be very supportive to the industrialization of the country along with improvement in the competitiveness in human resources and the final industrial products. Promotion of the private sector is also the focus of this new policy. The new industrial policy is also consistent with the long-term development initiative of the country as envisaged by the 15th plan and 15 years of development vision, mission, targets, and strategies developed by the National Planning Commission.

New Industrial Policy has efforts in getting privileged by using the new developments in information and communication technology, trade integration of Nepal in different regional trading blocs as well as in global trade integration. Furthermore, this new industrial policy also intends to use the opportunities in the giant neighbouring economies and the economies in the region that have created more liberal environments in terms of their industrial development where Nepalese exports could have some degree of integration. Likewise, production of the industrial products linked with the expansion of services sector is also the priority of the new industrial policy.

The constitution of Nepal 2015 has considered three main pillars of the economy: public sector, private sector, and the co-operative sector. The new Industrial Policy 2067 is seeking collaborative efforts among three tiers of government to boost industrial investment. The policy being more liberal and consistent with the investment policy, the productivity of the industrial labours, value added from this sector in the national economy, and the overall employment will rise.

Supply of the industrial products in the domestic market for import substitution, and promotion of potential exportable in which Nepal has comparative advantages are also considered essential for the sustainable growth of the industrial output. Most importantly, this industrial policy has adopted “No work no pay” principle in the industrial establishments. This policy has become very instrumental in reducing the number of strikes, lock-outs, and closure in industrial firms which were very frequent in 1990s and early 2000s.

For the promotion of national industrial activities, the new industrial policy has made a provision of buying industrial products by the public sector so long as they contain at least 30 percent domestic value addition.

In this broader framework of new industrial policy, sectoral policies deem necessary for the overall growth of the industrial sector. The action plan and associated industrial strategies proposed by this study for two different sectors, the case of agricultural and pharmaceutical sectors, is considered to be instrumental for developing strategies to other sectors as well.

3.5 Nepal’s trade policies and strategies

Nepal enacted liberal trade policy in 1992 along with efforts to attract more foreign direct investment and technology transfer. After Nepal’s integration to WTO, it formulated more comprehensive trade policy in 2009 that replaced previous trade policy and it harmonized other sectoral policies as well. Furthermore, Nepal Trade Integration Strategies (NTIS) were developed. Its major focus was how to create alignment between trade policy and NTIS, address increasing trade deficit, and promote exports by enhancing the supply-side capacities.

Trade Policy 2009 embraced the principles of liberal, open and transparent economic system and its primary objectives were to increase trade sector’s contribution to the national economy and help reduce poverty and accelerate economic growth (Ibid). Although marginal progress appeared without substantial improvements in Nepal’s overall trade performance, the country got another trade policy in 2015. The current Trade Policy 2015 aims to achieve economic prosperity by enhancing trade sector’s contribution to the national economy through export promotion. Various strategies follow this major objective of trade policy such as strengthening supply-side capacity, increasing exports of high value-added of competitive products and services in the world market, and along with the increasing access of goods and services, acquire intellectual property rights in the regional and world markets, among others.

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4. General Trend of Domestic Production, Import, and Consumption of Major Importable

4.1. General trend of domestic production

A. Cereal Crops

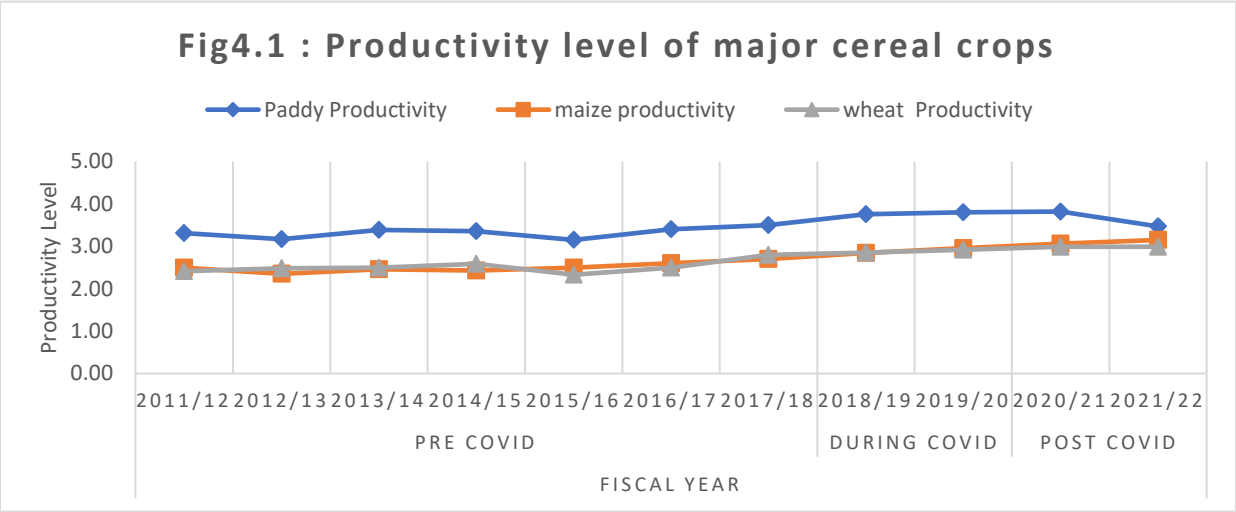
Paddy, maize, wheat, millet, Barley, and Buckwheat are the major cereal crops produced in Nepal. Among them paddy, maize and wheat are largely cultivated especially in the Terai and Hilly region. Paddy beats both maize and wheat in cultivated area, production and productivity level (Table 4.1).

Table 4.1: Production trend of major cereal crops

	Paddy			Maize			Wheat		
	Prod	**Area**	**Pro**	**Prod**	**Area**	**Pro**	**Prod**	**Area**	**Pro**
2011/12	5072.2	1420.50	3.31	2179.40	871.3	2.5	1846.1	756.3	2.44
2012/13	4504.5	1468.9	3.17	1999	949.6	2.35	1882.2	759.8	2.48
2013/14	5047.04	1362.9	3.39	2283.2	928.8	2.46	1883.1	754.4	2.5
2014/15	4788.61	1425.35	3.36	2145.29	882.4	2.43	1975.63	762.37	2.59
2015/16	4299.08	1362.91	3.15	2231.52	891.59	2.5	1736.85	745.82	2.33
2016/17	5230.33	1552.47	3.4	2336.68	924.32	2.6	1856.19	740.15	2.5
2017/18	5151.92	1469.54	3.5	2555.84	954.18	2.7	1949	706.84	2.8
2018/19	5610.01	1491.74	3.76	2713.63	956.45	2.84	2005.67	703.99	2.85
2019/20	5550.88	1458.92	3.8	2835.67	957.65	2.96	2185.29	707.51	2.92
2020/21	5621.71	1473.47	3.82	2999.73	979.78	3.06	2127.28	711.07	2.99
2021/22	5130.62	1477.38	3.47	3106.4	985.57	3.15	2144.57	716.98	2.99

Source: Economic Survey 2021/22, Ministry of Finance, Statistical Information on Nepalese Agriculture 2077/78 (2020/21), MoALD, Prod: production (in 000 Mt), Area: (in 000 Ha), Pro: Productivity (Mt/Ha).

Productivity level of paddy, maize and wheat, however, are not drastically different from each other. Average productivity of paddy during the last ten years is 3.47 Mt/Ha, which is slightly higher than the productivity of maize (2.68 Mt/Ha) and wheat (2.69 Mt/Ha) (Figure 4.1).

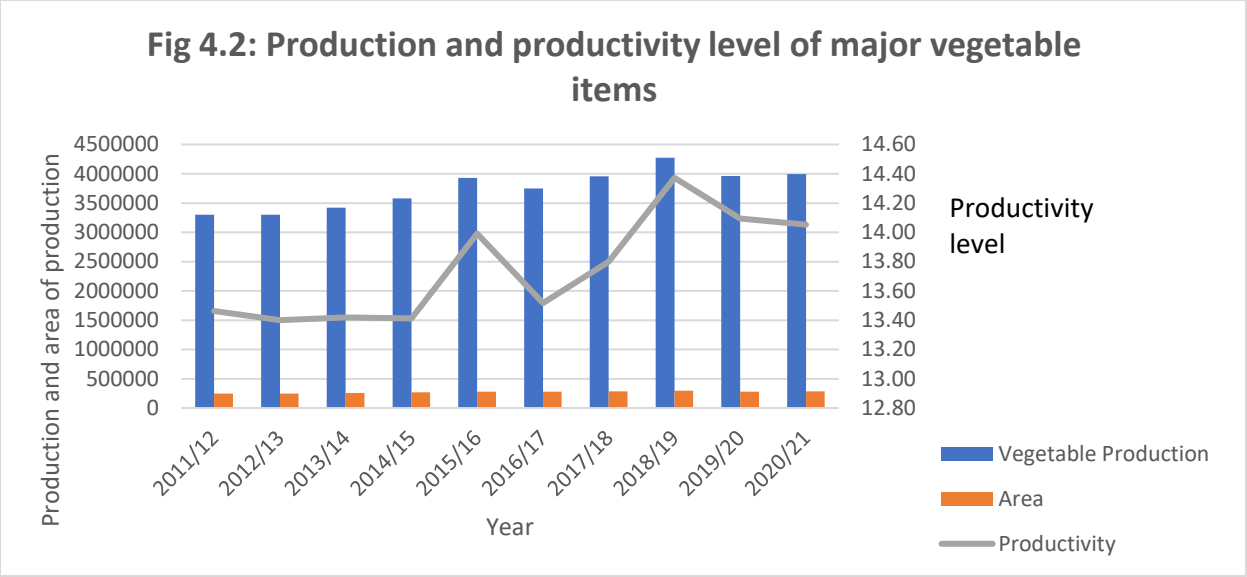


Current issues of paddy production in Nepal

In the agricultural sector of Nepal, rapid land encroachment is a major problem caused by unplanned urbanization. Nepal has lost nearly one lakh hectares of paddy land over the past ten years. Shortage of fertilizer, use of low-quality seeds, and delayed monsoon are major causes of low productivity of rice in Nepal. The rise in living standards and switch of many consumers from local to Basmati rice have also contributed to the huge import of rice every year.

B. Vegetable Items

Production and productivity level of vegetable items have been growing in last ten years. Area of cultivation for vegetable items ranges from 245037 hector in fiscal year 2011/12 to 284181 hector in fiscal year 2020/21. However, production and productivity are both in increasing trend despite some fluctuations, especially in the years of earthquake 2015 and Covid -19 pandemic. Average productivity level of vegetable production during the last ten years is 13.75 Mt/Ha (Figure 4.2).



Source: Ministry of Agriculture and Livestock Development, Statistical Information on Nepalese Agriculture, 2021/22.

Note: Production in Mt, Area in Hector.

Potato, Cauliflower/cabbage, Tomato, Green beans, Cucumber, Pumpkin, Radish, Brinjal, Ladies finger, Bitter guard, Peas, Parwal and Mushroom are widely produced and consumed vegetable items in Nepal. Fresh vegetable altogether has 16.67 percent contribution in agricultural GDP whereas potato alone shares 5.52 percent (MoALD, 2021/22).

C. Cash crops

Oil seed, cardamom, potato, sugarcane, tea, coffee, jute and cotton are the major cash crops cultivated in Nepal. Among them, sugarcane and potato have higher productivity, with ten years' average being 47.48, 15.02 Mt/Ha respectively (Table 4.2). Cardamom and coffee, despite less productivity, have higher export volume. In addition, honey and mushroom also deserve export potential. Cash crops have 7.33 percent contribution in total agricultural GDP.

Table 4.2: Production and productivity level of cash crops									
	Tea			Sugarcane			Potato		
Fiscal Year	Area	Prod	Pro	Area	Prod	Pro	Area	Prod	Pro
2011/12	18,149	18309.82	1.01	64472	2930047	45.45	190250	2584301	13.58
2012/13	19,036	20588.15	1.08	64483	2930000	45.44	197234	2690421	13.64
2013/14	20,120	21076.37	1.05	76863	3315939	43.14	205725	2817512	13.70
2014/15	26,165	23186.73	0.89	66600	3063000	45.99	197037	2586287	13.13
2015/16	27,688	24263.74	0.88	80931	4346754	53.71	199791	2805582	14.04
2016/17	28,241	24409.33	0.86	70708	3219560	45.53	185879	2591686	13.94
2017/18	28,595	24803.61	0.87	78609	3679508	46.81	195268	3088000	15.81
2018/19	28,732	25205.89	0.88	71625	3557934	49.67	193997	3112947	16.05
2019/20	16,901	24118.25	1.43	68565	3400176	49.59	188098	3131830	16.65
2020/21	16,917	23745.9	1.40	64354	3183943	49.48	198788	3325231	16.73

Source: For tea data, Tea and Coffee Development Board, Annual Progress Report 2021/22; for sugarcane and potato, Statistical Information on Nepalese Agriculture 2077/78 (2020/21), MoALD.

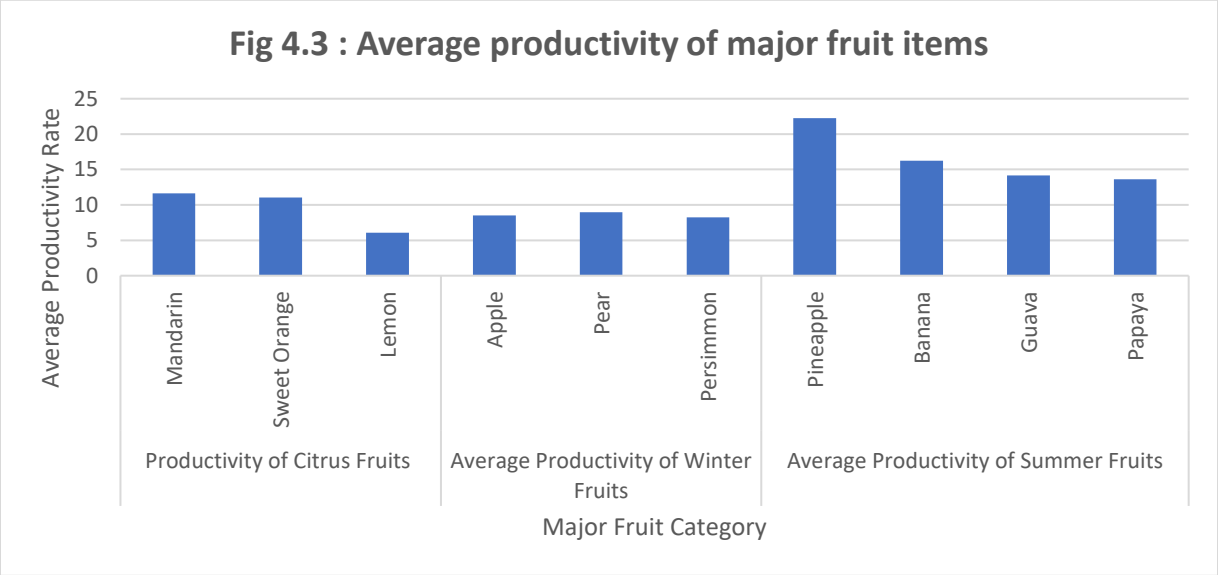
Note: Prod: production (in Mt), Area: (in 000 Ha), Pro: Productivity (Mt/Ha).

D. Fruits

Nepal has favourable climatic conditions for both winter and summer fruits. Average productivity of fruit items ranges from 6.21 to 7.39 Mt/Ha (Table 4.3). Mandarin, sweet orange and lime are the major citrus fruits cultivated in Nepal, basically in the hilly area, with average productivity of 9.3 Mt/Ha. Likewise, winter fruits comprise apple (9.1), pear (10.11), walnut (4.9), peach, plum and apricot as major cultivated items with average productivity 7.55. Similarly, major summer fruits include mangoes (11.81), banana (16.22), guava (14.16), papaya (13.6), jackfruit (13.1), pineapple (22.27) (Figure 4.3).

Table 4.3: Average production and productivity of fruit items in Nepal				
Year	Total area (Ha)	Commercial farming area	Production (Mt)	Productivity
2011/12	139321	24089	1029754	7.39
2012/13	137758	23645	938731	6.81
2013/14	148208	25497	965044	6.51
2014/15	150387	25261	992703	6.60
2015/16	157199	24854	976461	6.21
2016/17	162660	26759	1018308	6.26
2017/18	160394	25964	1086931	6.78
2018/19	164603	28411	1178352	7.16
2019/20	171318	27339	1249764	7.29
2020/21	177568	32188	1356218	7.64

Source: Statistical Information on Nepalese Agriculture 2077/78 (2020/21), MoALD. Prod: production (in Mt), Area: (in Ha), Pro: Productivity (Mt/Ha).



Source: Statistical Information on Nepalese Agriculture 2077/78 (2020/21), MoALD.

Figure 4.3 shows that summer fruits do have relatively higher productivity as compared to winter fruits and citrus fruits are in the middle. Mango with productivity 11.8 Mt/Ha and newly

introduced fruits such as kiwi (7.55), watermelon, avocado, rudrakshya and dragon fruits have exportable potential from Nepal. Contribution of fruits in agricultural GDP is nearly 8.5 percent, among them, Mango (2.51%), Banana (1.36%) and Guava (1.15%) do have higher contribution (MoALD, 2021/22). From the perspective of consumption pattern, banana, citrus fruits, mango, apple, pineapple, papaya, and grapes are the highly demanded fruits in Nepal (CBS Nepal, 2016/17).

E. Edible oil:

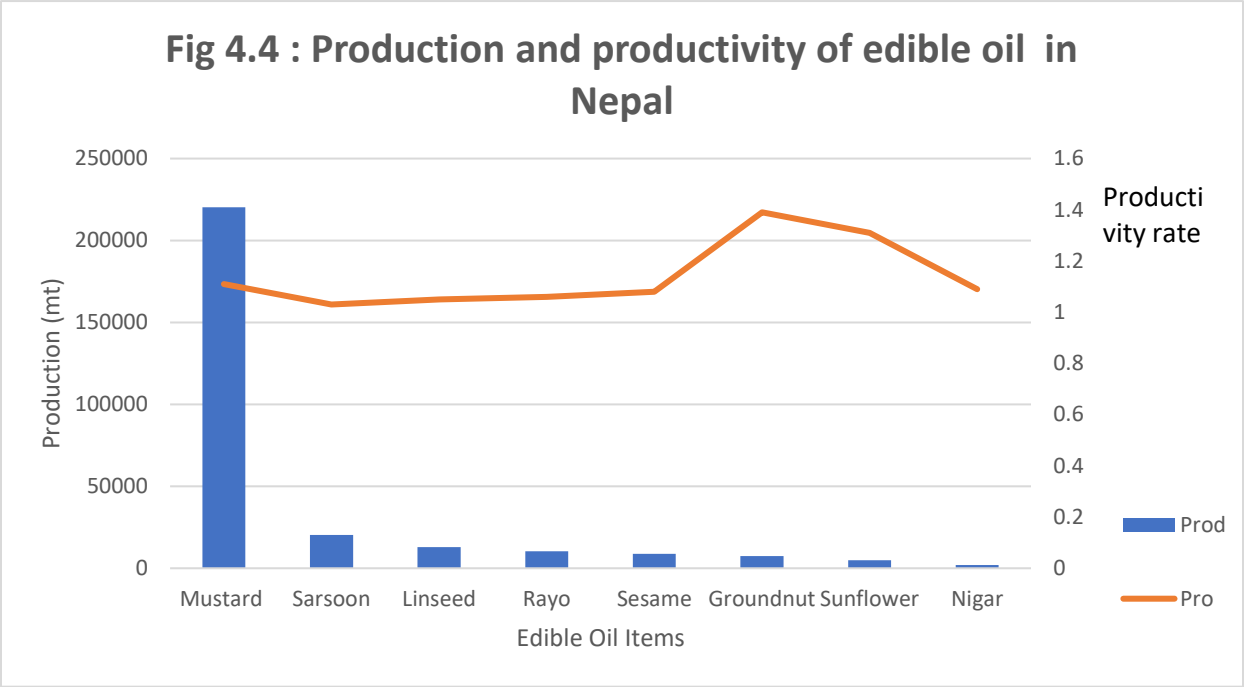
The area under cultivation and annual production of edible oil are in increasing trend over the last 10 years. However, land productivity of the edible oil in Nepal is very nominal with decade's average being 0.98 Mt/Ha (Table 4.4).

Table 4.4: Production and productivity of edible oil in Nepal

Fiscal Year	Total Area (in Ha)	Production (in Mt)	Productivity
2011/12	214835	179145	0.83
2012/13	215600	179000	0.83
2013/14	207457	181535	0.88
2014/15	233041	209612	0.90
2015/16	217867	208291	0.96
2016/17	207978	214451	1.03
2017/18	224595	245867	1.09
2018/19	260307	280530	1.08
2019/20	258141	278325	1.08
2020/21	259101	287038	1.11

Source: Department of Agriculture and Livestock 2021/22.

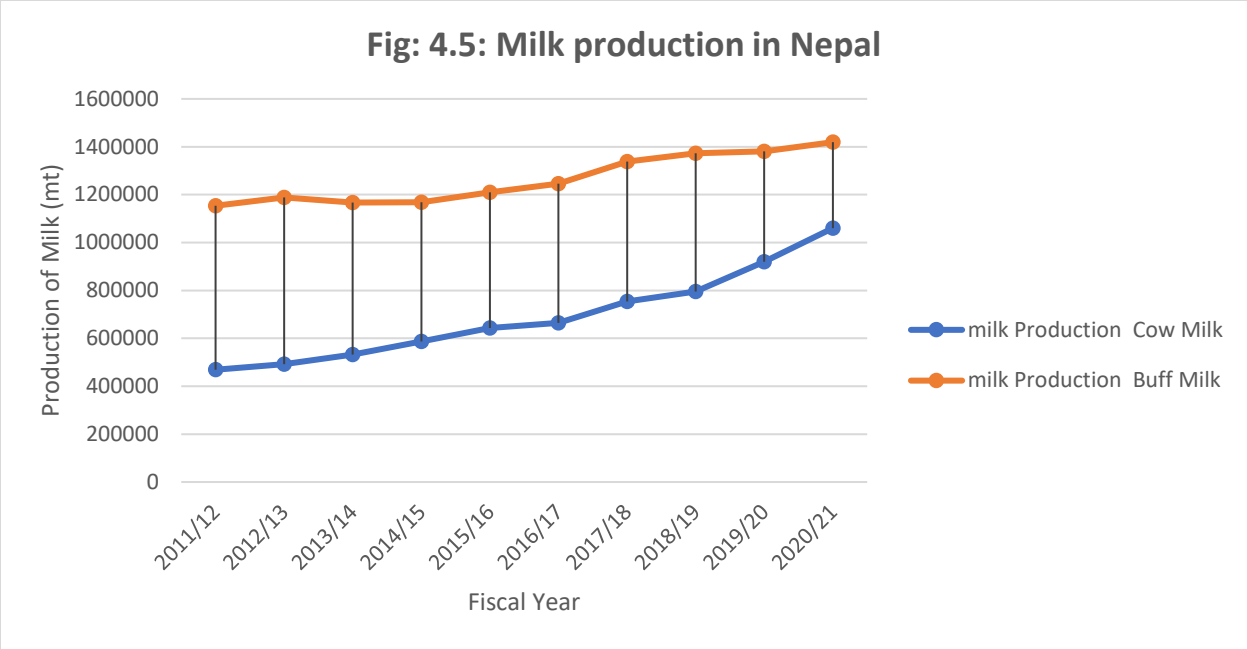
Mustard, Sarsoon, Linseed, Rayo, Sesame, Groundnut, Sunflower and Niger are the widely cultivated edible oil of Nepal. Among them cultivation/production of mustard is significantly higher compared to other. However, average productivity of edible oil items is minimal with 1.14 Mt/Ha (Figure 4.4).



Source: Department of Agriculture and Livestock 2021/22.

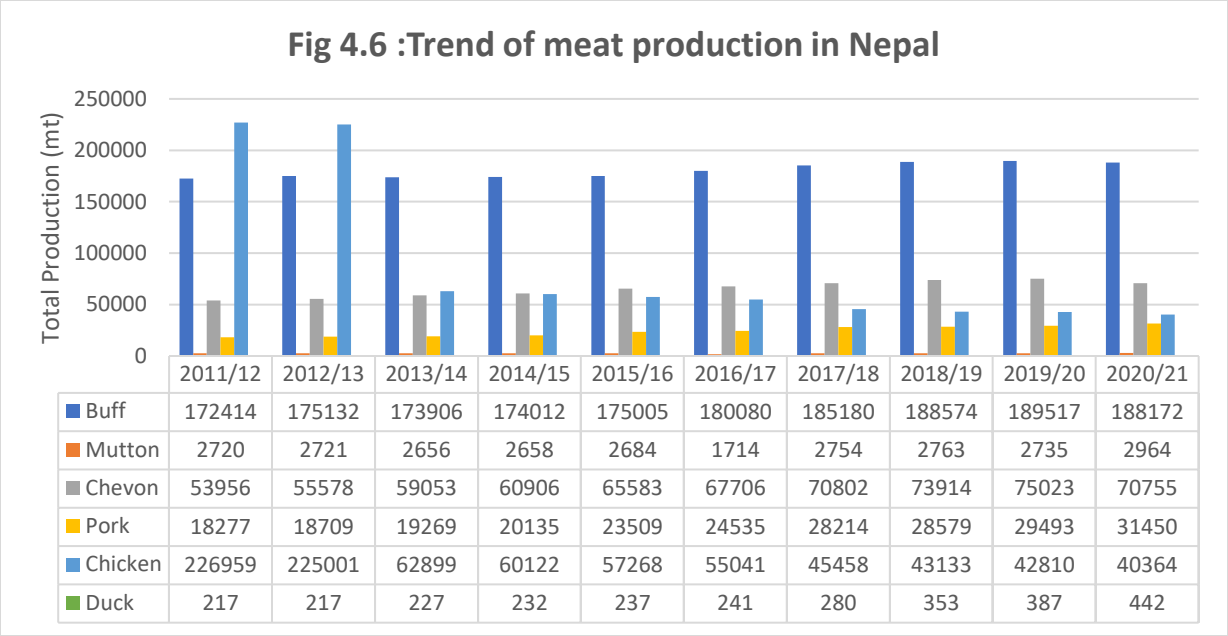
F. Livestock

Under livestock, dairy, meat and egg production are widely practiced in Nepal. For milk production, cow and buffalo farming is very common in hill and Terai region. Average annual milk production of Nepal during the last ten years is 1956658.4 metric ton where share of buffalo milk is higher than cow milk. However, growth rate of cow milk is higher than that of buffalo milk (Figure 4.5 and Appendix A3).



Source: Department of Agriculture and Livestock 2021/22.

In terms of meat, buffalo meat production is overwhelmingly high compared to other meat types after fiscal year 2013/14. It is followed by chevon, other meat items followed by chicken, pork, mutton, and duck, respectively (Figure 4.6). Average share of buffalo meat during the past ten year is 51 percent followed by chevon 18 percent, chicken 21 percent, pork 6 percent, and sheep mutton 1.4 percent.



	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Buff	172414	175132	173906	174012	175005	180080	185180	188574	189517	188172
Mutton	2720	2721	2656	2658	2684	1714	2754	2763	2735	2964
Chevon	53956	55578	59053	60906	65583	67706	70802	73914	75023	70755
Pork	18277	18709	19269	20135	23509	24535	28214	28579	29493	31450
Chicken	226959	225001	62899	60122	57268	55041	45458	43133	42810	40364
Duck	217	217	227	232	237	241	280	353	387	442

Egg production is significantly increasing in Nepal over the years with annual production of 80 crore (in number) in fiscal year 2011/12, 1.35 billion in fiscal year 2016/17 to 1.49 billion in fiscal year 2020/21 (MoALD, 2021/22).

Besides, production of fish is also significant in Nepal in meeting the domestic requirements. Fish farming area and fish production have increased by 58 and 40 percent in the last ten years. Similarly, productivity level of fish has also increased from 3.7 Mt/Ha in FY 2011/12, 4.9 in 2016/17 to 5.4 percent in FY 2020/21 (Table 4.5).

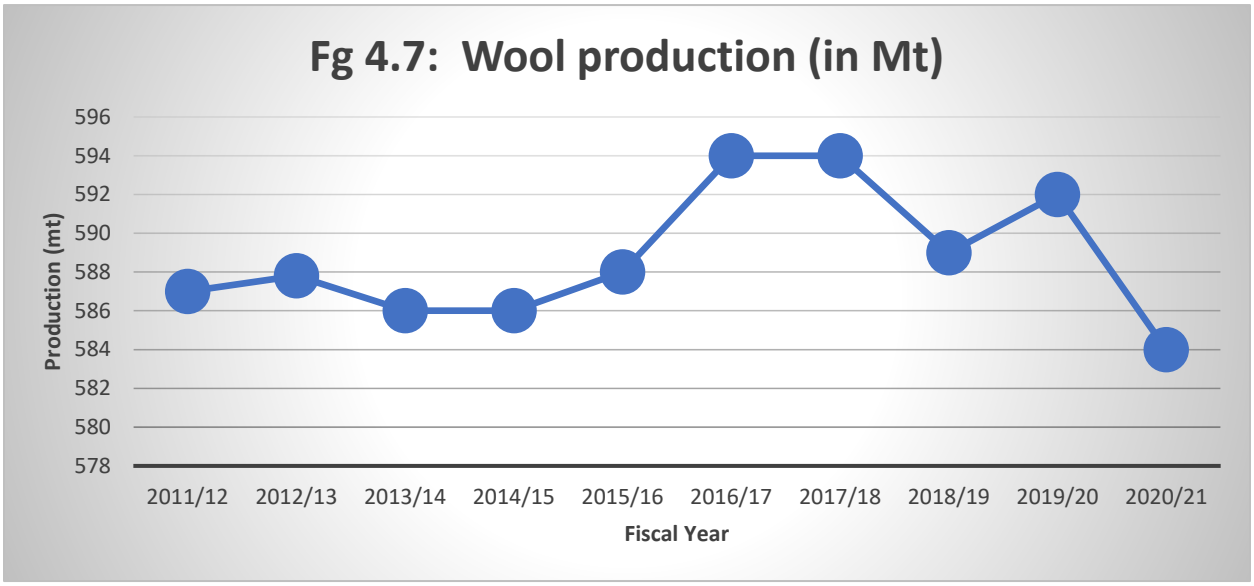
Table 4.5 Fish production in Nepal

	Fish farming Area (Ha)	Fish Production (Mt)	Productivity
2011/12	7939	29999	3.779
2012/13	8020	31221	3.893
2013/14	8600	37427	4.352
2014/15	9200	41481	4.509
2015/16	9934	48543	4.887
2016/17	11396	55842	4.900
2017/18	11889	58433	4.915

2018/19	12749	62725	4.920
2019/20	13476	66906	4.965
2020/21	13476	73693	5.468

Source: Department of Agriculture and Livestock, 2021/22.

Production of wool is another subsector of livestock category. In the past ten years, wool production has ranged from 587 metric ton in FY 2011/12 to 584 in fiscal 2020/2021. No significant variation has been observed in production level of wool in the study period with growth during 2015/16—2017/18 and decline thereafter (Figure 4.7).

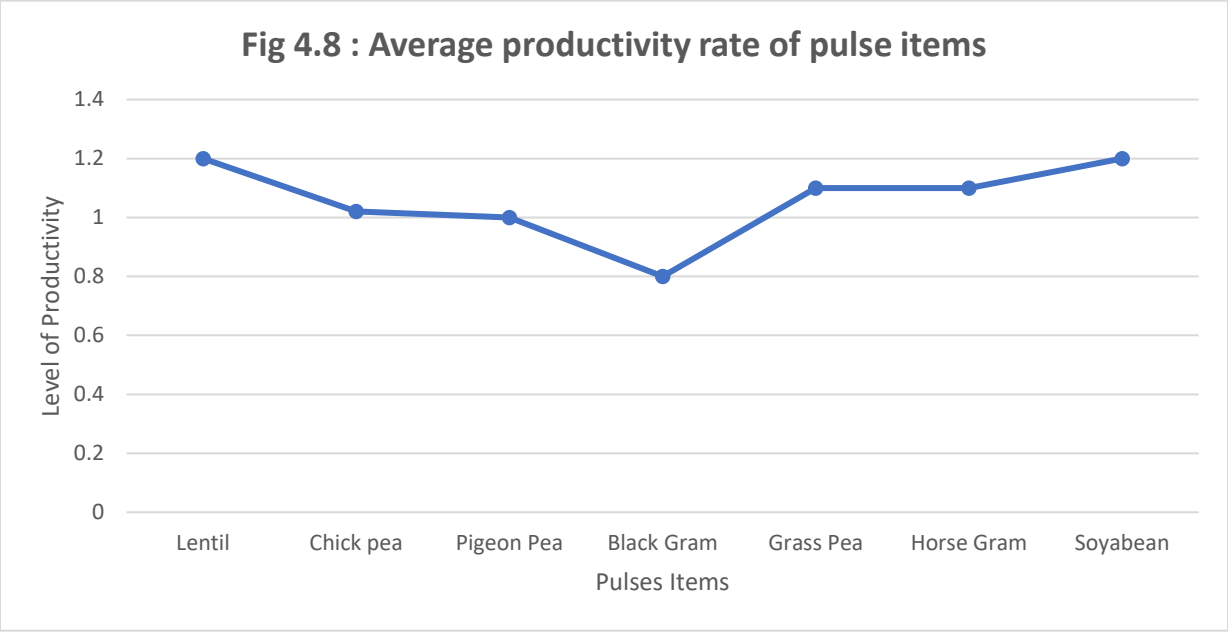


G. Pulses

Lentil, chickpea, pigeon pea, black gram, grass pea, horse gram, and soybean are the major pulse items cultivated in Nepal. Pulses are cultivated in 329 thousand hector land, with average production in ten years 367,270 metric ton and 1.12 average productivity rate (Table 4.6).

Lentil and soybean have higher productivity rate in pulses category with 1.2 Mt/Ha for each. Figure 4.8 shows the average productivity level of each pulse items during the past 10 years.

Table 4.6: Production of pulses in Nepal			
Fiscal Year	**Area**	**Production**	**Productivity**
2011/12	334232	319770	0.96
2012/13	332497	355784	1.07
2013/14	328738	352473	1.07
2014/15	326400	353500	1.08
2015/16	327321	363693	1.11
2016/17	326055	378196	1.16
2017/18	311382	368741	1.18
2018/19	331740	381987	1.15
2019/20	340692	404210	1.19
2020/21	335143	394355	1.18

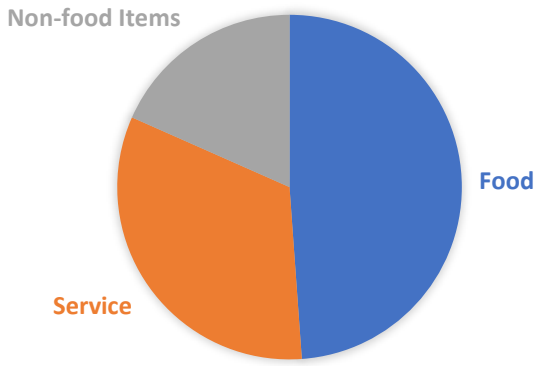


4.2 Consumption

Total consumption expenditure is constantly growing in Nepal. Average propensity to consume for the last one decade is 90.5 percent of the GDP; the private sector shares 80.7 percent, public

sector 8.3 percent and non-government social sector 1.6 percent. In total private consumption, average share of food items constitutes 48.86 percent followed by services 32.77 percent and other non-food items 18.37 percent, respectively (Fig. 4.9).

Fig. 4.9: Average consumption pattern during the last 10 years (in %)



Source: Economic Survey 2021/22, Ministry of Finance, Nepal.

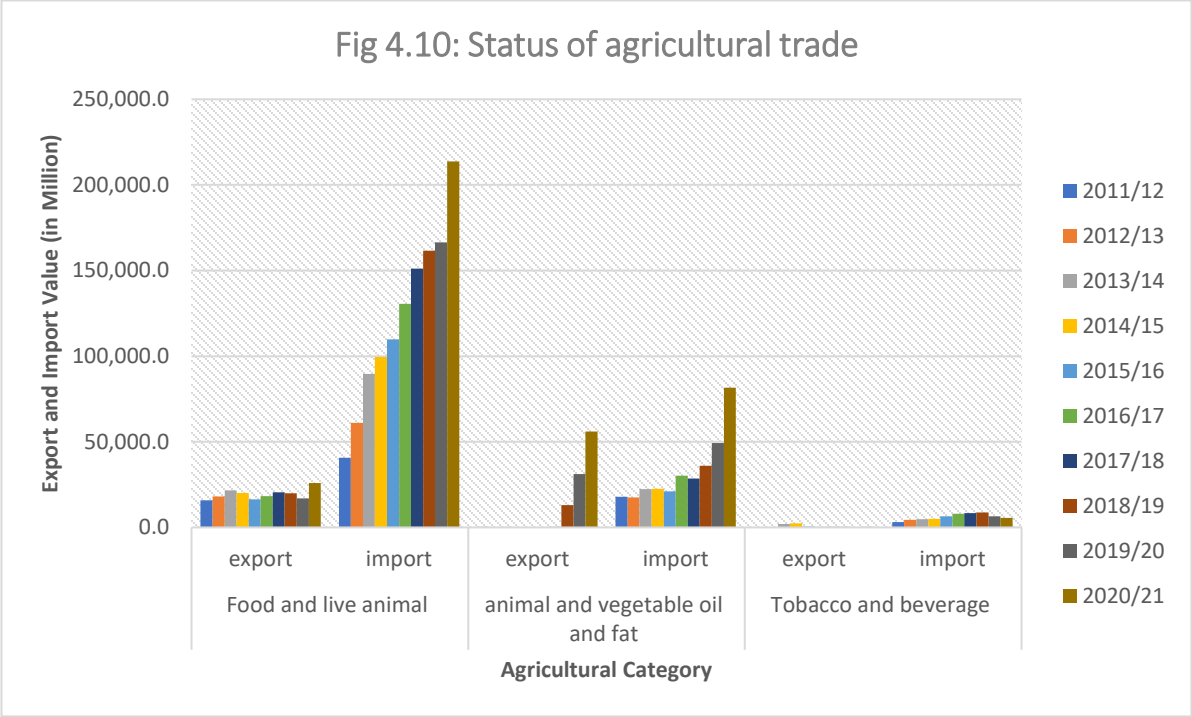
In overall, consumption expenditure for food alone constitutes 53.8 percent. followed by rent (12.7 percent), education (4.1 percent), alcohol and tobacco (3.7 percent), durables (7.1 percent), utilities (2.4 percent) and other non-food (18.1 percent) (CBS Nepal, 2016/17).

Households of urban areas consume about 1.5 times more than rural households. Food shares the major expenditure in both areas. However, rural people's expenditure on food items is higher by nearly 12 percent. Average food expenditure in rural areas is 57.1 percent of their total expenditure whereas it is 45.5 percent in urban areas. By consumption deciles, the ratio of the food expenditure of richest decile group is about 7 times higher to the poorest decile group (CBS, 2017).

Nepal has the highest per capita consumption of rice in the world at 137.5 kilograms per year. Rice makes up 67% of the total cereal consumption in Nepal and accounts for 40 percent of energy and 23 percent of protein in the diet. Likewise, it has 20 percent share in agricultural GDP and nearly 7 percent in overall GDP. Despite this fact, Nepal has not been able to increase the production and productivity of the paddy; the average growth of production and productivity of paddy production remained 3.47 and 1 percent during last decade (Joshi & Upadhaya, 2020). In addition, rice self-sufficiency ratio of Nepal is below 100, which indicates that domestic rice production is not sufficient to meet domestic consumption (Tripathi, Bhandari, & Ladha, 2019).

4.3 General trend of agricultural export and import

Nepal is facing huge trade deficit in agricultural sector. In the past ten years, import of food and live animals is 19 percent higher than the export. Similarly, import of animal and vegetable oil and fat is 17 times of the total export of the same category. The import of tobacco and beverage is also higher than the export value. As presented in figure 4.10, in both the first and second categories, growth of import is significantly higher than that of export. Export volume of animal and vegetable oil and fat has slightly increased after COVID-19 period.



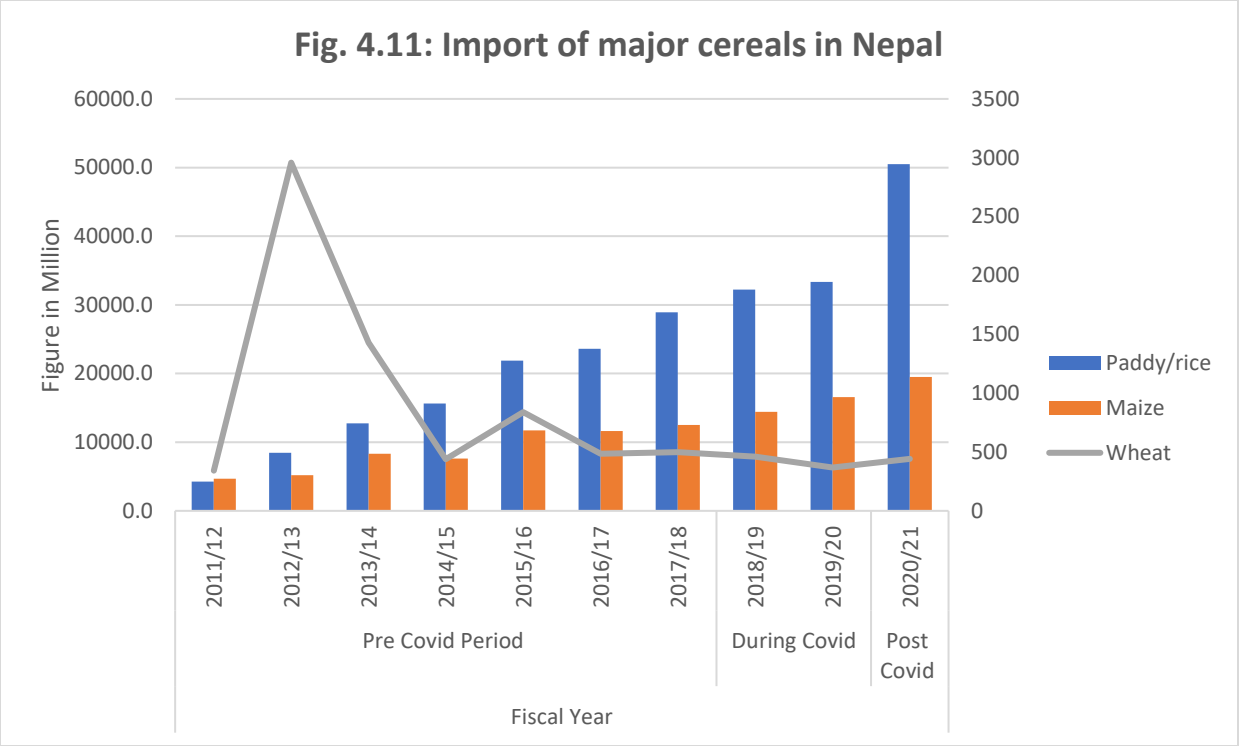
Researches have shown that increasing trend of Nepalese living standard has changed the food habit leading to import dependency. For example, increase in living standards and the switch from local rice to Basmati rice has also contributed to the draining of large amounts of money to import rice every year. Same case applied in other type of cereals crops. Shift in people's choice in food consumption resulting from the escalation of income source is one of the reasons of high demand of importable goods in Nepal (Khanal, Banskota, & Gir, 2017).

Table 4.7: Import of major cereals			
Fiscal Year	Paddy/rice	Maize	Wheat
2011/12	4267.0	4675.8	341.65
2012/13	8455.8	5214.7	2958.6
2013/14	12764.8	8297.1	1427.4
2014/15	15612.6	7607.7	438.8
2015/16	21863.2	11734.1	839.43
2016/17	23600.9	11607.9	485.79
2017/18	28909.9	12500.7	498.68
2018/19	32215.0	14427.4	461.84
2019/20	33350.4	16561.8	369.25
2020/21	50478.2	19483.5	440.31

Source: Paddy/ Rice: Nepal Rastra Bank, Current Macro Economic and Financial Situation of Nepal, 2021/22. Maize and Wheat: Trade Promotion Centre, https://nepaltradeportal.gov.np/web/guest/data-visualization.

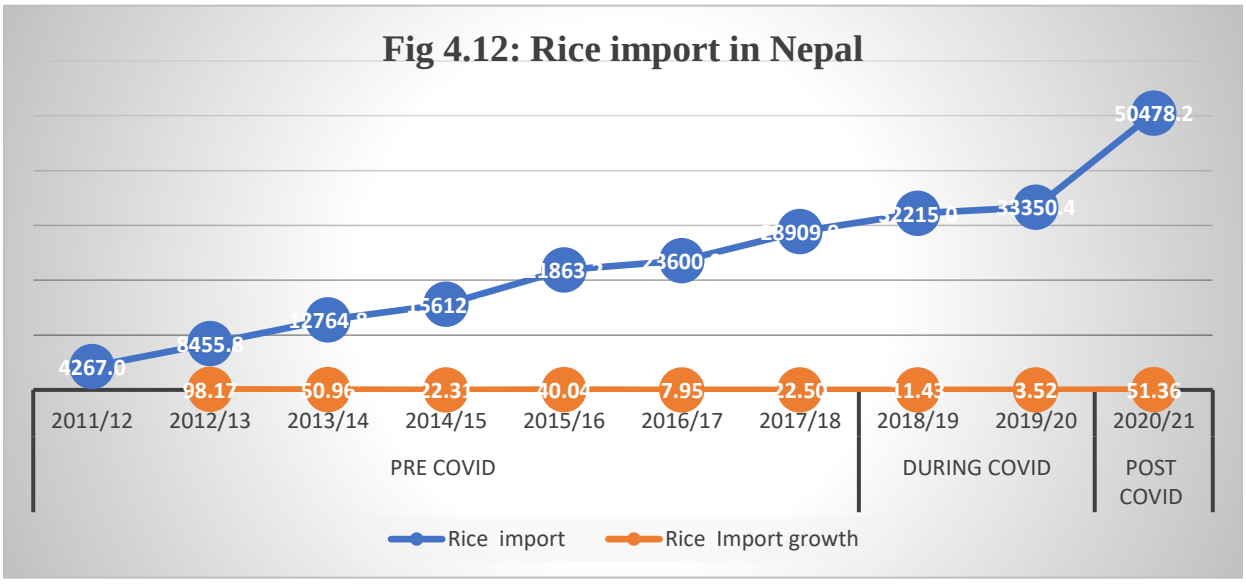
Note: Figure in million Mt.

Paddy, maize and wheat are the major imported cereal corps in Nepal. Among them, import volume of paddy beats the rest of two cereals namely maize and wheat, respectively. In fiscal year 2020/21 import volume of paddy remains nearly 50 billion followed by maize 19 billion and wheat 44 hundred million (Fig. 4.11). Cereal crops are largely cultivated in Nepal and has highest self-sufficiency ratio. Despite this, imports of cereal, especially paddy and maize are skyrocketing (Table 4.7).



Source: Nepal Rastra Bank.

Over the study period, rice import has been growing up with average annual growth rate of 23 percent. Except in the years of trade disruption with India and Covid-19 pandemic, rice import has been constantly increasing in Nepal. In the last FY 2020/21, Nepal imported rice amounting Rs. 50.47 billion which was 51 percent more than the worth of rice imported in the previous year. Nepal imports rice mainly from India, China, and Thailand (Figure 4.12). The post-covid rise in



the import of rice might be due to the ever-increasing demand of fine rice by expanding middle-income families. This rice, mainly Basmati, is not sufficiently produced in Nepal (Prasai, 2021).

Rice import has the overall dominance in the cereal import; its share ranged in between 58 to 78 percent during the last ten years.

Table 4.8: Trade performance of rice (Values in ten million Rupees)

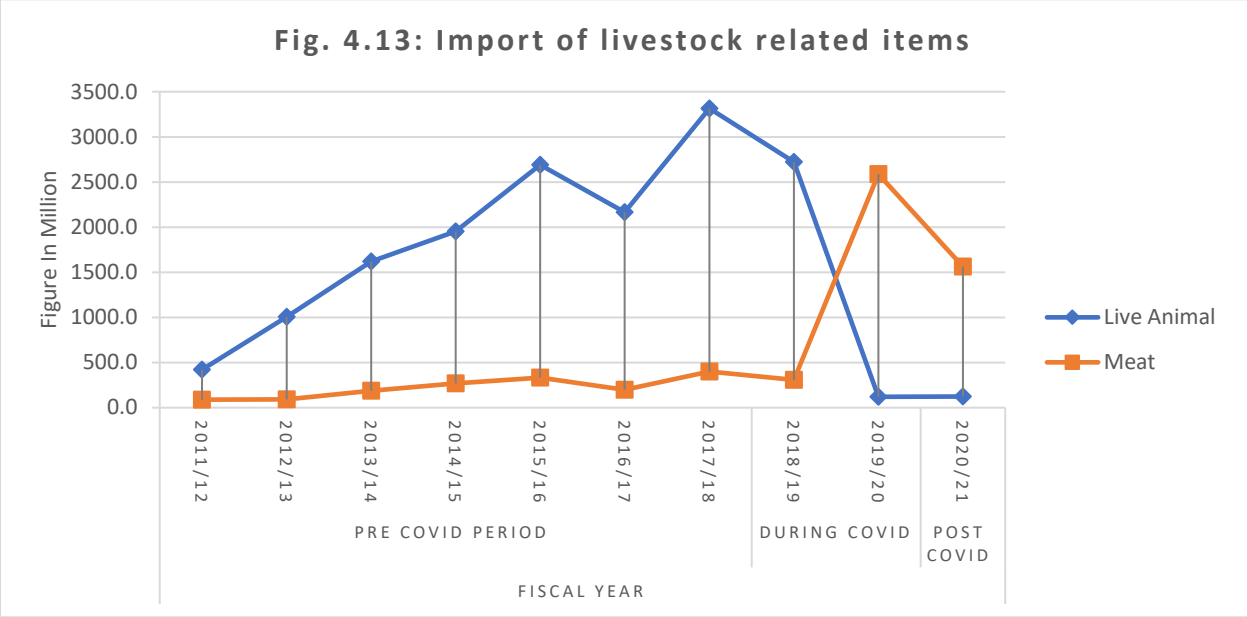
Fiscal Year	Rice import	Total cereals import	Share of rice import in total cereal import
2011/12	928.8122	1197.244	77.58
2012/13	1433.758	2004.76	71.52
2013/14	1725.476	2816.199	61.27
2014/15	2483.472	3567.012	69.62
2015/16	2300.554	3902.591	58.95
2016/17	2386.72	4014.837	59.45
2017/18	2940.941	4541.445	64.76
2018/19	3259.505	5180.24	62.92
2019/20	3365.143	5688.431	59.12
2020/21	5078.695	7886.498	64.40

Livestock and fishery

For the study purpose, import of livestock item is mainly classified into two groups: import of meat items and live animal. As mentioned above, average per capita consumption of meat in Nepal is 18 kg per year (Annual Household Survey, 2016/17). Annual meat consumption of Nepal in 2020 is 552 Mt. Out of this, poultry meat positions 46% followed by buffalo 33%, goat 17% and pork 4 % (DoLS, 2020/21).

In the study period, import of live animal was higher and had increased in increasing rate in comparison to meat item before Covid period. However, Covid period changed the import scenario. Import of live animal after 2018 decreased sharply by 95.6%. Contrary to this, import of meat items increased significantly in the same time period. The figure below shows that Nepal is gradually becoming self-sufficient in terms of live animal. However, increment in the import of

meat has created new scenario. Meat of bovine animals, frozen, boneless, meat of sheep, cuts with bone in, frozen, meat of swine are the major meat items imported.



Source: Nepal Rastra Bank, Current Macro Economic and Financial Situation of Nepal, 2021/22, Trade Promotion Centre, https://nepaltradeportal.gov.np/web/guest/data-visualization

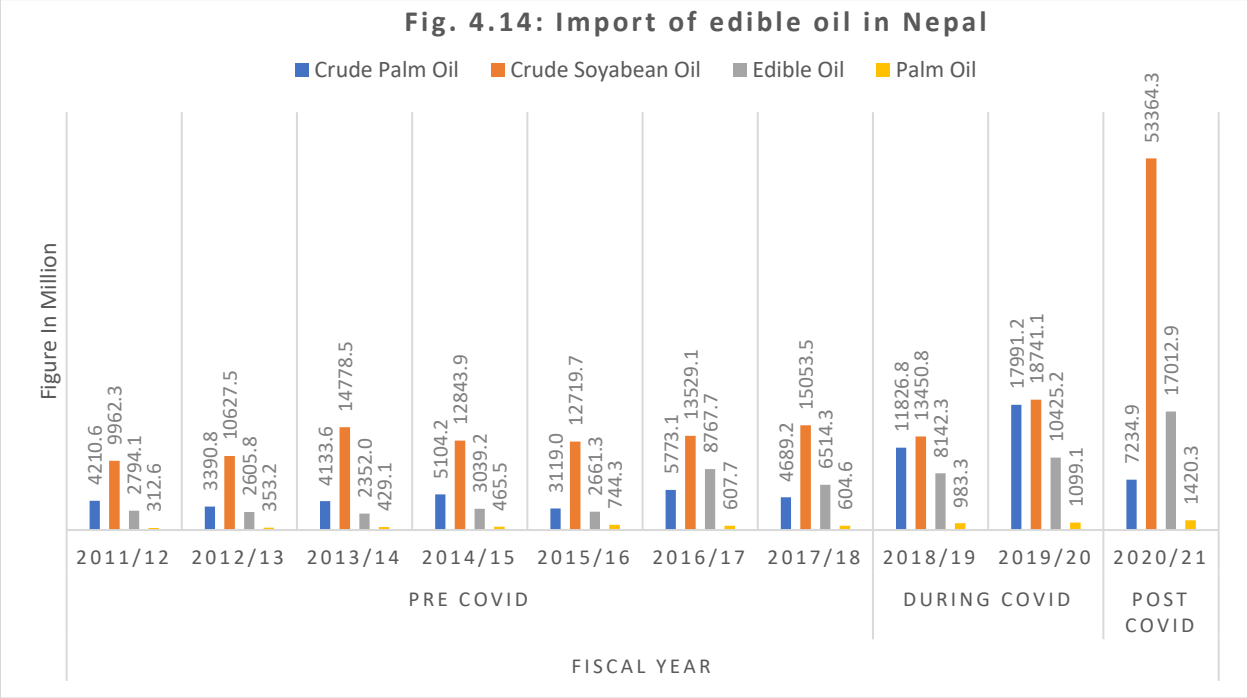
In addition, Nepal is gradually becoming self-sufficient in the production of live fish and fish product. According to annual progress report of Central Fish Promotion and Conservation Centre, domestic fish production covers around 86 percent of market demand. Import of fish and sea food in fiscal year 2020/21 was about 1.6 billion (CFPCC, 2021/22).

Edible Oil

Edible oil category is among the largest import items in Nepalese economy. In the last fiscal year 2021/22, Nepal imported crude edible oil amounting Rs 99.51 billion. Crude palm oil, Soybean oil, edible oil and palm oil are the major oil categories imported in Nepal for the purposes of re-exporting refined oil to India. In fiscal year 2020/21, Nepal imported crude palm oil worth 7 billion, crude soybean oil worth Rs 53 billion, edible oil worth Rs 17 billion, and palm oil worth 1.4 billion. Import of crude soybean oil has the highest figure in comparison to other category presented in the Table 4.9 and Figure 4.14.

Table 4.9: Import of edible oil (In million Rs)				
Fiscal Year	Crude Palm Oil	Crude Soyabean Oil	Edible Oil	Palm Oil
2011/12	4210.6	9962.3	2794.1	312.6
2012/13	3390.8	10627.5	2605.8	353.2
2013/14	4133.6	14778.5	2352.0	429.1
2014/15	5104.2	12843.9	3039.2	465.5
2015/16	3119.0	12719.7	2661.3	744.3
2016/17	5773.1	13529.1	8767.7	607.7
2017/18	4689.2	15053.5	6514.3	604.6
2018/19	11826.8	13450.8	8142.3	983.3
2019/20	17991.2	18741.1	10425.2	1099.1
2020/21	7234.9	53364.3	17012.9	1420.3

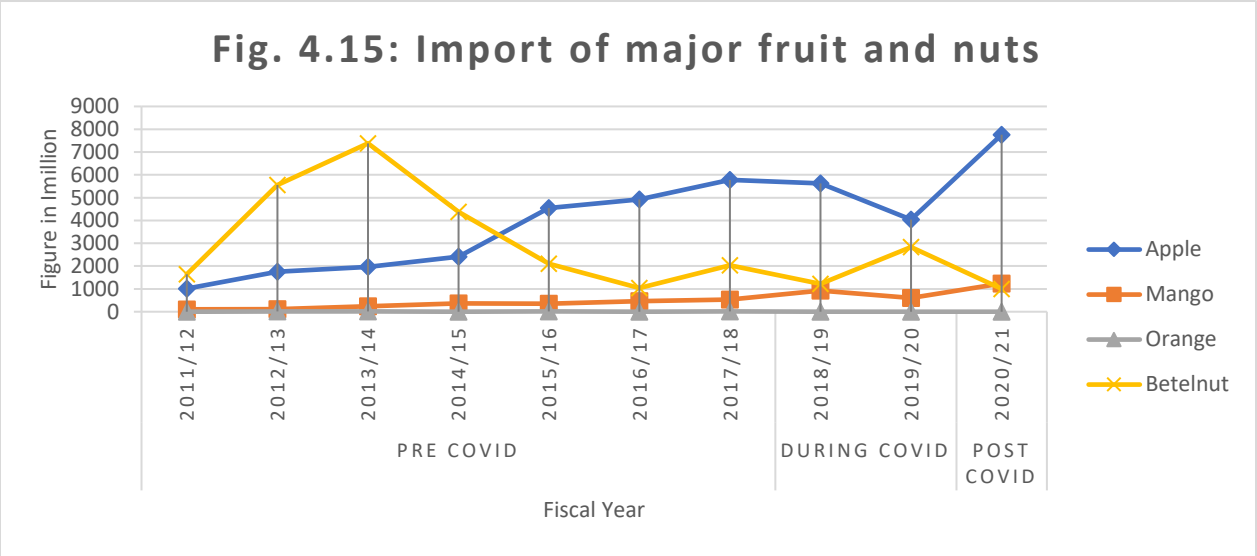
Source: Nepal Rastra Bank, Current Macro Economic and Financial Situation of Nepal, 2021/22.



Source: Nepal Rastra Bank, 2021/22.

Fruits and nuts

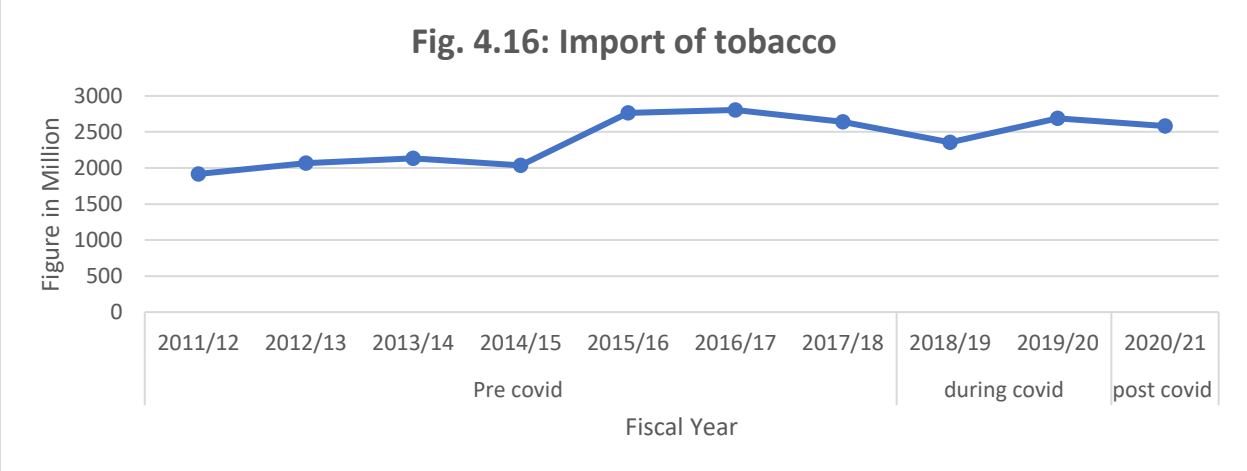
Import of fruits and nut items is significant in Nepal. In the study period, import of apple stood as a highest imported item. In fiscal year 2011/12 import of apple worth nearly Rs. 1 billion which reached at Rs. 5.7 billion in 2017/18. Slight decrease can be observed in the import during Covid period; however, import of apple increased sharply after Covid amounting Rs. 7.7 billion in fiscal year 2020/21. Import of mango and orange, though increasing at steady rate, is significant during the same period. Likewise, import of betelnut is also high. However, its volume is not as high as the volume of apple.



Source: Nepal Rastra Bank, Current Macro Macro Economic and Financial Situation of Nepal, 2021/22.

Tobacco

Tobacco is also a largely imported items of Nepal, ten year's average import worth Rs. 2.3 billion. Figure 4.16 shows that the economic fluctuations (i.e., earthquake and blockade from India 2015/16, and Covid context) didn't seem to have influence in the import of tobacco.



5. Action Plan for Import Substitution and Export Promotion for Industrial Development Strategies

This chapter presents the action plan for industrial and pharmaceutical products for short-term, medium-term, and long-term. The short-term refers the period of the on-going 15th development plan – upto the FY 2023/24, medium-term upto the period of attaining sustainable development goals (2029/30), and long-term upto FY 2042/43 – 20 years from now. The action plan specifies end goals of production and investment levels, milestones and deadlines associated with them. Corresponding industrial strategies will follow these action plans.

5.1 Action plan for agricultural products

Preparation of the short term (FY 2020/21 to 2023/24) action plan assumes the annual increment of the growth rate of agricultural products by ten percent. The level of annual output targets gives the annual level of investment required based on incremental capital output ratio (ICOR) as specified by the 15th Plan. For agricultural products, the ratio 3.3 has been applied accordingly. In this way, FY 2020/21 becomes the baseline level for the growth rate, investment and the level of output.

Table 5.1 presents the proposed growth rate, investment required, and the level of output for agricultural products under the proposed action plan.

Table 5.1: Proposed growth pattern of agricultural products

	2020/21	21/22	22/23	2023/24	2029/30	2042/43
Growth rate				**Short-term**	**Medium-term**	**Long-term**
Cereals	1.670	1.84	2.02	2.22	5.14	5.91
Pulses	-2.4	2.16	2.38	2.61	4.63	5.09
Diary Product	7.7	8.47	9.32	10.25	18.16	19.97
Meat	-1.7	1.53	1.68	1.85	3.28	3.61
Vegetable	0.8	0.86	0.94	1.04	1.84	2.02
Fruits	8.5	9.37	10.31	11.34	20.09	22.10
Fishery	10.1	11.15	12.27	13.50	23.91	26.30
Edible oil	3.1	3.44	3.79	4.17	7.38	8.12
Production				**Short-term**	**Medium-term**	**Long-term**
Cereals	10381.6	10572.30	10785.93	11025.68	13731.60	14543.50
Pulses	397.14	405.72	415.36	426.21	529.88	556.87
milk Production	2479.9	2689.95	2940.57	3241.94	7294.96	8751.89

Meat	520.74	528.71	537.61	547.56	639.39	662.46
Vegetable	3993.17	4027.43	4065.44	4107.65	4483.06	4573.76
Fruits	1360.83	1488.37	1641.81	1827.99	4456.42	5441.23
Fishery	104.62	116.29	130.56	148.18	421.87	532.82
Edible oil	287.04	296.92	308.17	321.01	452.49	489.23
Investment				**Short-term**	**Medium-term**	**Long-term**
Cereals		629.3	705.0	791.2	2215.9	2679.3
Pulses		28.3	31.8	35.8	77.4	89.1
Diary Product		693.2	827.1	994.5	3699.2	4807.9
Meat		26.3	29.4	32.8	67.0	76.1
Vegetable		113.1	125.4	139.3	267.2	299.3
Fruits		420.9	506.3	614.4	2460.2	3249.9
Fishery		38.5	47.1	58.1	268.6	366.1
Edible oil		32.6	37.1	42.4	102.6	121.2

Note: Growth rate in percentage, production in thousand metric tons, and investment in crore.

5.2 Short-term action plan for agriculture

5.2.1 Objectives, deadline, milestones, and resources

Under the given assumption as mentioned above (Section 5.1), the growth rate of the agricultural products becomes 5.8 by FY 2023/24 – consistent with the objective of the 15th Plan.

It is estimated that in order to maintain 1.84 percent growth rate in cereals production of fiscal year 2021/22 nearly 6 billion investments required. Likewise, dairy products, vegetables and fruits production require higher investment with 6 billion, 1 billion, and 4 billion Rupees, respectively. As the growth rates of all agricultural products are set at 10 percent higher than the previous year, the investment must also grow accordingly.

The short-term target, for the FY 2023/24, of total investment is Rs. 2708.5 crore and the total agricultural production 21646.21 thousand metric ton. In order to materialize these prospects, some strategic measures deem necessary on top of Nepal's current industrial, and agricultural policies. These recommended strategic measures are in Section 5.2.2 below.

5.2.2 Short-term strategies

Development of the short-term strategies has been based on the existing productivity level of different crops. More specifically, agricultural yield with high domestic demand and high land productivity will be promoted in the short-term. Strategies will also associate issues on backward and forward linkages for their sustainable growth of the agricultural output.

Vegetable farming

i. Majority of the farmers engaged in vegetable farming are subsistence farmers; they require quality inputs, information, and technology to expand their farming. The

quality inputs refer to the goods and services from the plantation upto distribution. The information must be symmetrical in both demand and supply sides. Most importantly, subsidies to the agricultural producers for the establishment of cold-storage system is necessary; however, government's technical support deem essential for the monitoring of temperature and humidity. Consequently, the role of mediators will go down gradually. Promotion of social media might also be instrumental in this regard.

ii. Poor information chain and market connectivity need to be addressed, particularly in case of vegetable and fruit products because of their perishable nature. Use of technology might help in this regard, i.e. cell phone networking between producers' and wholesalers' groups would make symmetrical inflow flow of information in both sides and the role of mediators would be minimized.

iii. Encroachment of land, and increasing real estate business- land plotting -- are causing the loss of productive land; they have caused the decline of the growth potential of the fertile land suitable for vegetable production, especially in Kathmandu valley, Chitwan, etc. Agricultural, industrial and resettlement plans need to be harmonized in this regard.

iv. Scanty subsidies to farmers are the major causes for low production of vegetable items and are also the major threat of vegetable growers. Horticultural subsidies in India need to be taken into consideration for subsidies in Nepal as well. See Appendix B for subsidies in India.

v. Profit efficiency of farmers in terms of technical capacity/knowhow should get improved. Studies reveal high level of profit inefficiency in case of vegetable farmers in Nepal (28 percent level). Approximately two-thirds of this inefficiency is caused by technical, allocative and scale inefficiency which are all management problems. The remaining is caused by climatic conditions that require climate-friendly agriculture technology and adaptation (Pal et al., 2019; Shrestha and Bokhtiar, 2019; and Shrestha et al., 2022). In order to reduce this level of profit inefficiency, some strategic measures deem necessary. The profit efficiency in vegetable farming can be enhanced by adopting improved seed varieties and control of hybrid and low-yield quality by the government, improving effective information and extension programmes, increasing accessibility of credit facilities to the farmers, developing market infrastructure, and empowering women farmers in vegetable farming that leads to improve household income and nutrition security.

vi. Nepal's seed dependency in terms of vegetable is nearly 95 percent. Hybrid seed should be banned; this has long-term negative impact on productivity. Local seeds need promotion based on research and innovation.

Livestock and dairy products

vii. High cost of production, especially on animal feed and high investment cost, uneven market access (limited number of farmers have easy access of big milk processors)

(NDDB, 2021) are key challenges in production and marketing of diary product. Market access strategies differ among products and across region. They need exploration.

viii. Animal Feed: Animal Feed alone stands around 64% of total cost required for animal husbandry (Khana, et al., 2022). Thus, domestic industries producing animal feed are required.

ix. Establishment of Dairy Management Information System regarding input, production, and market chain, and establishment of National Dairy Marketing Intelligence Platform (NDMIP) as well as Local Dairy Marketing Intelligence Platforms (LDMIP) are crucial to discuss and interact/exchange business performance and experiences for enhancing dairy sector performance.

5.3 Medium-term action plan

5.3.1 Objectives, deadline, milestones, and resources

The medium-term in this study refers to the period FY 2024/25 – 2029/30. The endline targets are considered to be closer to MDG. For medium term (by FY 2029/30) and long-term (by FY 2042/43), the action plan has proposed 15 percent annual increment in the growth rate of all agricultural activities. Because of the series of strategic measures followed in the short run, the 15 percent rise in the growth rate of all agricultural products is logical, which is five percent higher than the rate proposed during the short-term period.

The rise in growth rate by 15 percent gives the annual investment and production level to reach Rs. 9158.1 crore and 32009.68 thousand metric ton, respectively (Table 5.1) for the final year of the medium-term FY 2029/30. The average growth rate will be 10.55 percent in the FY 2029/30.

Medium-and long-term strategies focus to the products that have limited domestic demand, higher export potential but do have lower land productivity. The products that satisfy two out of three conditions mentioned above are to be addressed by medium-term strategies and those produce that have all three characteristics will require long-term industrial strategies to their growth, domestic consumption, and export. Those addressed by long-term strategies basically require long gestation period to get the outcome.

Cereals, livestock, tea/coffee and fishery production can be placed in medium term strategies in terms of time of cultivation and production. Cereals have relatively low productivity in Nepal than fruits, livestock and fishery.

5.3.2 Medium-term strategies

Cereal crops

i. *Marshi, Pokhareli, Jetho Budho, and Jorayel Basmati* are some of the high demand indigenous paddy varieties having better potential for increasing production and productivity. Besides, indigenous seeds are eco-friendly having better nutrients. Thus, in collaboration with local governments, promotion of indigenous seeds need to be prioritized. They needed to have intellectual property right acquired by Nepal.

ii. Nepal government fixes minimum support price to paddy (also that of some cash crops such as sugarcane); and this is basically applicable in Terai. Fixing minimum support price should be by the local government and this strategy should apply throughout the country. The major objective of this strategy will be for making the country self-sufficient in meeting overall rice consumption demand of the country.

iii. Ministry of Agriculture and Livestock Development, Nepal Agricultural Research Council, University of Agriculture and Forestry should be brought under the same umbrella for research and collaboration. Avoiding duplication of work and promotion of improved technology for higher productivity deem necessary in this regard.

iv. Expansion of the agricultural roads is highly recommended as it facilitates the market expansion of the agricultural products.

Fruits

i. High Hills, Mid Hills and Terai should specialize on the commercial production of 2--3 fruits in each of these geographical regions. One Village One Product campaign makes the fruit/agricultural markets widely fragmented; therefore, intensive production scheme with export potential of limited fruits deems necessary.

ii. Agricultural technicians in the public sector working in district and municipality level should work longer in the given jurisdiction; it is because they need few years to develop knowledge on climatic conditions and adaptation of plants and livestock in the given environment and can provide better services to the farmers. Frequent transfer of them erodes this possibility. Presently, agricultural personnel without chance of developing local knowledge are transferred from one to another place frequently. They do not get opportunity to specialise in one particular area which is a loss to the farmers and the agricultural sector as a whole.

Fertilizer

i. Nepal imports approximately three hundred billion Rupees worth of fertilizer, technology and agricultural equipment (Adhikari, 2022), which has made our cost of production high.

This needs gradual control. The subsidies need to domestic producers so long as the scope of domestic production exists to compete with imported fertilizer, technology, and agricultural equipment.

ii. In farm management, scientific use of wild biomass energy and municipal waste as an organic fertilizer deem necessary. Transfer of technology for cost-effective production of these organic fertilizer could enhance agricultural production and productivity.

iii. Latest Doing Business Index (DBI) for Nepal shows that registration for the industry, registering the property, and getting credit is relatively easier in Nepal; however, doing business and paying taxes are quite difficult in Nepal. Service delivery of the government regarding this should be simplified.

5.4 Long-term action plan

5.4.1 Objectives, deadline, milestones, and resources

This study has regarded the period beyond FY 2029/30 to FY 2042/43 as the long-term period. The average annual growth rate of all category agricultural sector has been targeted to be 11.54 percent in the final fiscal year of the long-term period (FY 2042/43). This growth rate is attained by the rise of annual growth rate of all category agricultural products by 15 percent. This will make total agriculture output of 35551.76 thousand metric ton in FY 2042/43. Likewise, total investment in every fiscal year has been estimated based on the constant ICOR in the agricultural sector as referred by the 15th Plan; this estimates total investment required in the agricultural sector Rs. 11688.9 crore. Furthermore, these milestones and investment resources should be coupled with several strategies in the following section (5.4.2). The annual projections of the growth rate, output, and the investment required are given in the Appendix C.

5.4.2 Long-term strategies

Long-term industrial strategies aim to improve production, productivities, and the export of potential agricultural and pharmaceutical products. It is considered to have enough time in the long-run to make improvements in these regards. Following are the proposed strategies on top of what has already been mentioned in the Industrial Policy 2067.

i. Establishment of Land Bank in collaboration with local government was a good initiative of the government initiated through the budget speech of the FY 2019/20; however, it did not get momentum. It is expected to utilize the barren land suitable for cultivation. Alternative to land bank, co-operative farming is also very useful strategy where lands are fragmented and farmers are small holders. Co-operative farming can pursue collective cultivation, harvesting, and marketing their products. Moreover, farmers can buy seeds, fertilisers, and machines such as tractors, harvesting and thrasher machines, etc. for common use. This strategy has dual benefits, minimisation of risks and utilization of marginal lands.

ii. Objective 7.5, clause 8.18 of the Industrial Policy 2067 has envisaged the establishment of an effective institution to facilitate acquiring intellectual property right, however, this has not yet been materialized so far. Initiative regarding this is recommended.

iii. Government of Nepal has brought Reintegration Programme Directive for Returnee Migrants 2022 with an objective of creating space for the migrant workers where they can utilize their experience and knowledge optimally, however, such initiatives have not yet in process. These initiatives should be linked with the industrial strategies and promotion of agricultural activities.

iv. Nepalese diplomatic missions abroad should work with economic diplomacy to attract foreign investments in specific industrial activities that has the prospect of technology transfer, employment generation, and utilization of local raw materials.

v. Although property registration and issuing bank credit is relatively easy in Nepal, the lending interest rate is quite high and discouraging investment. This applies to agricultural and pharmaceutical industries as well. Bank lending interest rate on industrial activities should be lower than that in trading activities and this difference should prolong.

5.5 Action plan for pharmaceutical products

5.5.1 Situation of pharmaceutical industry in Nepal and proposed action plan

Altogether 128 pharmaceutical companies are registered in Nepal with 3 Ayurvedic, 12 veterinary and 113 allopathy companies by 2022 according to the Department of Drug Administration (DDA). Total domestic investment in pharmaceutical industry is above 35 billion Rupees. However, for the last five years, average annual import of raw materials of Nepalese pharmaceutical companies amount nine billion Rupees along with nearly 3 billion for packaging materials. Despite the increasing trend in registration, majority of these pharmaceutical companies are operating below their capacity and quality human resource is also low in this regard. The traditional approach of protecting infant industry – such as pharmaceutical industry in Nepal – is through higher import tariff where there are close substitutes in domestic market, import quota restriction, and subsidies to the domestic products so that they can compete with the foreign products.

Nepalese pharmaceutical companies produce generic medicines that hardly compete with products from international companies. Most of the pharmaceutical companies are operating through semi-automated production process. Producers requires huge investment for purchasing high-tech technology (DoI, 2021). Most of the established international pharma-companies invest huge amount (nearly 20 % of their revenue) for research and development through patented sale. Nepal government should focus on raising investment on research and innovation in pharmaceutical industry; there must be regulations on it. This will be supportive to

raise the credibility of the products from Nepalese pharmaceutical industry (Baral, 2022). For the improvement of pharmaceutical product quality, continuous manufacturing deems necessary instead of traditional batch manufacturing that also reduces the cost of testing and the amount of extract at the end of the production process. Zenon technology is in widespread use for this purpose.

Despite general growth in investment and production of pharmaceutical industry in Nepal, procuring raw materials is a biggest challenge here. India alone supplies 80% of the raw materials. China and third countries fulfil the rest especially for allopathic and veterinary medicine. For ayurvedic, 40 % raw materials are imported. Tariff rate for imported raw material is high (13%) along with one percent in imported packaging material. This needs revision to control the price of the final products. Likewise, export of raw materials and import of final products to and from India is also the case of pharmaceutical products and this needs reversal.

Chances of cross-contamination and false labelling of pharmaceutical products has become a challenge now. WHO has developed GMP Guideline (Good Manufacturing Practice- Guideline) to control this problem. GMP helps ensuring quality and international standard in the production of pharmaceutical products. Till date only 30 percent (nearly 40 Nepali pharmaceutical companies) have followed WHO GMP guideline. This has reduced the trust on the Nepali medicines in comparison to Indian ones. Improving the credibility is, therefore, one of the challenges of Nepali pharmaceutical products. Government should make the GMP certification mandatory for all pharmaceutical companies.

5.5.2 Domestic production/sales trend and the proposed action plan

Table 5.2 presents the sale of domestically produced pharmaceutical products for the last five fiscal years (2015/16 – 2020/21). The growth rate of the pharmaceutical products is rather volatile during this period that ranges between -15 percent to over 20 percent. This shows uncertainties and bottlenecks in the production and sales of pharmaceutical products.

Table 5.2: Domestic sale of pharmaceutical products

Year	Domestic sale	Growth rate
2015/16	19.58	
2016/17	20.07	2.50
2017/18	24.18	20.48
2018/19	20.55	-15.01
2019/20	24.53	19.37
2020/21	26.25	7.00

Source: Department of Industry. *Note:* Values in billion Rupees.

Short-term action plan

Based on the trend of the growth rate, we make an assumption of the possibility of the resumption of the growth rate 19.37 percent (FY 2019/20) and make progressive growth rate onward. After applying this projected growth rate for the base year (FY 2020/21), we assume additional 12 percent growth in the annual growth rate of pharmaceutical products in successive years. This rule applies upto the FY 2023/24. As revealed by Table 5.3, the growth rate will reach 27.21 percent and the total output worth of Rs. 54.14 billion will be produced. The annual investment to materialize this prospect requires to grow consistent with the ICOR of 5.2 for manufacturing sector as specified by the 15th Plan.

Medium-term action plan

The medium-term action plan has been proposed for the period FY 2024/25 – 2029/30. The growth rate has been scaled up with annual increment by 15 percent. This gives the range of output as given in Table 5.3. In the final year, the output worth of Rs. 633 billion has been projected. With the application of ICOR for manufacturing sector, Table 5.3 also provides the annual level of investment required to meet this projection.

Long-term action plan

The long-term vision, i.e. 20 years from now, explores the scenario for the growth of pharmaceutical products and associated investment upto the FY 2042/43. The increment in the growth rate by 15 percent will just continue and the annual output level will reach Rs. 1079 billion in 2042/43. Using the ICOR for manufacturing sector, the investment requirement to meet this target of output will become Rs. 2455 billion for the FY year 2042/43 (Table 5.3).

Table 5.3: Short-term, medium-term, and long-term projected scenario of pharmaceutical industry

	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2042/43
Growth rate (in %)											
Pharmaceutical Product	19.37	21.69	24.30	27.21	30.5	35.1	40.3	46.4	53.3	61.30	70.50
Production (Rs. In billion)											
Pharmaceutical Product	26.24	32.62	41.49	54.14	73.11	102.58	150.14	230.17	371.28	633.03	1079.32
Investment (Rs. In Ten Million)											

Pharmaceutical Product		35.1	48.8	69.6	104.4	162.1	261.5	440.2	776.1	1439.6	2454.6

Consistent with these action plans to boost the level of output and to reduce the large volume of imports, the following section recommends some strategic measures supportive these action plans.

5.5.2 Proposed industrial strategies for pharmaceutical products

Expansion of pharmaceutical industry is encouraging in Nepal. The quality control is the pressing needs now. Followings are the proposed industrial strategies to the long-term sustainable growth of this sector:

Short-term

i. Department of Industry (2021) discloses that Nepali drug companies have to pay 1500 USD as a registration fee to central drug laboratory of India for getting export permission while Indian companies pay only 50 thousand in Drug Administration to export medicine in Nepal. This differential treatment to exporters in two countries has been discouraging to Nepali exporters. GON should work for making them equal.
ii. More than one-third of drugs produced in India do not meet minimum standard; out of this 20 percent drug is sold illegally (Ibid). This alarming picture shows that Nepal (especially the Terai region) has become the hot spot for illegal drug supply. Ministry of Industry, Trade and Supply (especially Department of Industry) should make joint monitoring team with Nepal Drugs Limited for periodic market survey to control this problem.
iii. Public hospitals should have a directive to prescribe Nepalese pharmaceutical products even if the prices of them are upto 10 percent higher compared to the imported products so long as the qualities of the former are controlled.

Medium-term

i. Expenditure on research and development is very minimal in Nepalese Pharmaceutical industries. In foreign established companies, it is around 20 percent of the industrial income of these activities (Baral, 2022). This is causing continuation of the import of pharmaceutical products even if the substitute Nepali products are available in the market. It is recommended to have a legal provision of making about five percent of their total annual turnover on research and development at the beginning and periodic growth thereafter.

ii. Safeguard, Anti-Dumping and Countervailing Act 2019 needs effective implementation; this has become more crucial now.
iii. Provision of positive effective rate of protection to pharmaceutical product is warranted to ensure that the country has adequate value addition in the final products. However, the tariff rate to the raw materials for pharmaceutical industry is considered high whereas to the packaging materials very low (13 vs. 1), which is discouraging the import of raw materials. Only nominal positive effective rate of protection arising from the import of intermediate products would be an effective strategy.
iv. Nepali pharmaceutical industries have high tax burden. Producers have to pay income tax, VAT, custom and excise duties in importing raw materials, packaging items, industrial equipment and technology for production and income tax at the end which demotivate them to increase production. While for the import of finished medical product, only five percent custom duty is levied. Government tax system for pharmaceutical companies is not business-friendly. It creates space for the imported medicine. Due to uneven tax policy, Nepali producers can hardly compete with Indian product. The tax policy, therefore, requires revision.

Long-term

i. Nepal Medicine Policy 2007 allows collaboration between Nepali and foreign companies to co-work for pharmaceutical sector. For attracting FDI, letting foreign companies to establish pharmaceutical companies in Nepal, creating favourable environment for Nepalese companies to collaborate with other branded companies around the world are some key strategies that will be conducive to export of medicine from Nepal. Foreign Investment and Technology Transfer Act 2019 has provisions of direct establishment of industries and technology transfer to them in Nepal. This provision can be instrumental for attracting FDI in this sector.
ii. Nepali pharmaceutical industries are running with under-utilization of their capacity. The following strategies deem essential for their fuller utilizations:
    - Government should provide licenses only to the required number of pharmaceutical industries so that they run with their full potential.
    - Incentives to the firms using domestic raw materials deem necessary compared to those who rely on imported raw materials; they can be tax holidays, VAT incentives, cash incentives, or long-term subsidized loans. Furthermore, custom duties on raw materials for pharmaceutical industry should be fairly low compared to that of the final product.

Table 5.4A: Growth, Production, Investment and Strategy Matrix (Agriculture)

1. Agriculture

Time Period	Target in the final tear	Strategy	Responsible agency
Short term (FY 2020/21 – 2022/23)	Average annual growth rate of 5.3%, total investment of Rs. 2708.5 crore, and total output upto the final year Rs. 21646.21 crore	**Vegetable Items** i. Subsidies to the agricultural producers for the establishment of cold-storage system is necessary; however, government's technical support deem essential for the monitoring of temperature and humidity. ii. Encroachment of land, and increasing real estate business in fertile lands in Kathmandu, Chitwan, and other valleys needs to get controlled. Agricultural, industrial and resettlement plans need to be harmonized in this regard. iii. Scanty subsidies to farmers are the major causes for low production of vegetable items and are also the major threat of vegetable growers. Horticultural subsidies in India need to be taken into consideration for subsidies in Nepal as well. iv. Nepal's seed dependency in terms of vegetable is nearly 95 percent. Low yield hybrid seeds should be banned gradually along with the promotion of endogenous improved seed varieties **Livestock and dairy products** v. Facilitation and tax incentives to domestic industries producing animal feed are required. vi. Establishment of Dairy Management Information System regarding input, production, and market chain, and establishment of National Dairy Marketing Intelligence Platform (NDMIP) as well as Local Dairy Marketing Intelligence Platforms (LDMIP) are crucial to discuss and interact/exchange business performance and experiences for enhancing dairy sector performance.	Agriculture Knowledge Centre of the district Ministry of Land Reform Ministry of Finance NARC/MoALD Department of Custom MOF DDC/MoALD

medium	15% growth rate in the final year, Rs. 9158.1 crore final year investment, and 32009.68 thousand metric ton final year output	**Cereal crops** vii. *Marshi, Pokhareli, Jetho Budho, and Jorayel Basmati* are some of the high demand indigenous paddy varieties. They needed to have intellectual property right acquired by Nepal. viii. Fixing minimum support price by the local government throughout the country deem necessary. The quantity unsold by the producers should be bought by the government and distributed through Nepal Food Corporation. ix. Expansion of the agricultural roads is highly recommended as it facilitates the market expansion of the agricultural products. **Fruits** x. One Village One Product campaign should stem to crop intensification and commercialization to make pocket, block, zone and super zone of the respective product. xi. Frequent transfer of agricultural technicians should be avoided to make them familiar with the climatic condition of the given jurisdiction and make their service delivery effective. **Fertilizer** xii. Subsidies should be confined to those who compete with imported fertilizer, technology, and agricultural equipment. xiii. Scientific use of wild biomass energy and municipal waste for organic fertilizer deem necessary. Transfer of technology for cost-effective production of these organic fertilizer could enhance agricultural production and productivity. xiv. Doing business and paying taxes are quite difficult in Nepal despite simple procedure of industry and property registration. Service delivery of the government regarding this should be simplified.	MoALD/MoICS MoALD MoALD/MoPIT MoALD MoFAGA MoALD MoICS MoF

long term	11.54 percent final year growth rate, Rs. 11688.9 crore final year investment, and 35551.76 thousand metric ton final year output	xv. Co-operative farming needs promotion for cultivation, harvesting, and marketing supportive to buy seeds, fertilisers, and machines such as tractors, harvesting and thrasher machines, etc. for common use. This strategy has dual benefits, minimization of risks and utilization of marginal lands. xvi. Objective 7.5, clause 8.18 of the Industrial Policy 2067 has envisaged the establishment of an effective institution to facilitate acquiring intellectual property right, however, this has not yet been materialized so far. Initiative regarding this is recommended. xvii. Reintegration Programme Directive for Returnee Migrants 2022 should be linked with the industrial strategies and promotion of agricultural activities. xviii. Nepalese diplomatic missions abroad should work with economic diplomacy to attract foreign investments in specific industrial activities that has the prospect of technology transfer, employment generation, and utilization of local raw materials. xix. Lending interest rate on industrial activities should be lower than that in trading activities and this difference should prolong.	MoALD MoICS MoICS MoFA NRB, MoF

Note: Growth in Percentage, Investment in Billion, Production in thousands metric ton.

Table 5.4B: Growth, Production, Investment and Strategy Matrix (Pharmaceutical sector)

Time Period	Target in the final tear	Strategy	Responsible agency
Short term	12 percent growth rate, Rs. 69.6 bil. Investment, output Rs. 54.14 billion	i. Registration fee to Central Drug Laboratory of India by Nepali exporters and export registration fee to Drug Administration to export medicine in Nepal by Indian exporters are unequal and in favour of Indian exporters. GON should work for making them equal that would favour Nepali exporters.	DDA
		ii. Department of Industry should make joint monitoring team along with Nepal Drugs Limited for periodic market survey to control the inflow of unstandardized Indian drugs.	MoICS
		iii. Public hospitals should have a directive to prescribe Nepalese pharmaceutical products even if the prices of them are upto 10 percent higher compared to the imported products so long as the qualities of the former are controlled.	MoH, MoF
Medium term	15 percent growth rate, Rs. 1439.6 investment, and Rs. 633 billion output	iv. Expenditure on research and development should be mandatory to Nepalese Pharmaceutical industries; at the beginning approx. 5% of their annual turnover.	DDA
		v. Safeguard, Anti-Dumping and Countervailing Act 2019 needs effective implementation; this has become more crucial now for the protection of Nepali farm products.	MoF
		vi. Provision of positive effective rate of protection to pharmaceutical product is warranted to ensure that the country has adequate value addition and competitiveness in the final products.	MoF
Long term	15 percent growth rate, Rs. 2454.6 billion Investment, and Rs. 1079 billion output	vii. In line with Nepal Medicine Policy 2007 and Foreign Investment and Technology Transfer Act 2019, the provisions of direct establishment of JV pharmaceutical industries be emphasised.	MoF
		viii.	

6. Summary, and Proposed National Industrial Strategies to Agriculture and Pharmaceutical Products

6.1 Summary

The production and export of tradable have not improved over the years in Nepal; rather deterioration is apparent. Nepal Government's common minimum programmes and associated policies endeavours to industrialization, downsize trade deficit through import substitution and export promotion of agricultural and industrial products. In light of this condition, this study from the National Planning Commission (NPC) intended to develop the industrial strategies comprising two basic sectors, agriculture and pharmaceutical products in the backdrop of 15th Plan policies, programmes and existing acts and regulations in Nepal.

The overall objective of this assignment was to explore strategies how to reduce the trade deficit of Nepal, more specifically to that of the agricultural and pharmaceutical products along with the increase of their domestic production and consumption from domestic supplies. The study has used data from the Department of Customs, Ministry of Finance, Nepal Rastra Bank, Ministry of Industry, Commerce, and Supplies, Trade and Export Promotion Centre, Department of Drug Administration, and Central Bureau of Statistics.

The national industrial strategies have been proposed for three different periods: short-term (1-3 years), medium-term (3-10 years), and long-term (10-25 years) that will be conducive to import substitution and export promotion of Nepal's agriculture and pharmaceutical products.

Consumption

Total consumption expenditure is constantly growing in Nepal. Average propensity to consume for the last one decade remained 90.5 percent of the GDP; the private sector shares 80.7 percent, public sector 8.3 percent and non-government social sector 1.6 percent. In total private consumption, average share of food items constitutes 48.86 percent followed by services 32.77 percent and other non-food items 18.37 percent, respectively. In overall, consumption expenditure for food alone constitutes 53.8 percent followed by rent (12.7 percent), education (4.1 percent), alcohol and tobacco (3.7 percent), durables (7.1 percent), utilities (2.4 percent) and other non-food (18.1 percent).

Households of urban areas consume about 1.5 times more than rural households in average. Food shares the major expenditure in both areas. However, rural people's expenditure on food items is higher by nearly 12 percent. Average food expenditure in rural areas is 57.1 percent of their total expenditure whereas it is 45.5 percent in urban areas. By consumption deciles, the

ratio of the food expenditure of richest decile group is about 7 times higher to the poorest decile group according to the Central Bureau of Statistics estimate.

Among the food items, Nepal has the highest per capita consumption of rice in the world at 137.5 kilograms per year. Rice makes up 67 percent of the total cereal consumption that accounts for 40 percent of energy and 23 percent of protein in the diet. Likewise, it has 20 percent share in agricultural GDP and nearly 7 percent in overall GDP. Despite this situation, Nepal has not been able to increase the production and productivity of the paddy that remained 3.47 and 1 percent during last decade. In addition, rice self-sufficiency ratio of Nepal is also below 100.

Domestic production, and international trade

The target annual average economic growth rate during the 15th plan was 9.6 per cent and that of the agriculture, industry, and service sectors were expected to be 5.4, 14.6, and 9.9 percent, respectively. The Plan has projected the share of agriculture in GDP decline from 27 to 22.3 percent and the trend during the plan period is following this projection. However, growth of the relative share of industrial sector's contribution in GDP is slower than projected, from 15.2 to 18.8 percent. Consequently, a big chunk of the labour force dependent on agricultural sector would be transformed into the industrial and service sectors. However, the growth of the services sector is faster than expected and that of industrial sector is not only slower than expected but it is also fluctuating.

Nepal has been making a long effort for encouraging the foreign investment along with technology that will help import competition and export promotion. Although this policy continues from the last several national development plans, the trade deficit is on the rise as the size of imports has been increasing in alarming rate whereas the exports of goods and services remain constant or even declining in many cases. The balance of payment situation of the country shows that foreign exchange reserve of Nepal is mainly determined by the size of imports and the inflow of remittances. The balance of payment situation of Nepal was in surplus in the past several years despite a continuous increase in trade deficit only because of the remittance income. Trade deficit in Nepal is more than one-third of its GDP and foreign remittance is more than one-fourth of GDP that mainly goes for financing the import; therefore, very small portion of Nepal's import is being met by its export earnings.

Nepal's external trade suffers with many problems. More than two-thirds of its trade is with India, with very limited exportable items and they are mainly primary goods. Energy and tourism are two major export-oriented sectors but only very limited potential of them has been harnessed so far. Likewise, remittance income has not yet been primarily linked with domestic production system but fuelling the import, therefore, foreign exchange reserve is the major challenge for Nepal's external sector. Several non-tariff barriers also exist in Nepal's external trade including limited ports available in India and China for transit and transportation. The country needs tremendous effort in exploring the potential to increase agricultural and industrial products and export them to developed countries including the neighbouring ones. Several

decades ago, agricultural products dominated Nepal's export sector; thereafter woollen carpets and garments dominated the country's overall external trade. Currently, export of human resources is the major source to meet the merchandise trade deficit.

Nepal is facing huge trade deficit in agricultural sector. In the past ten years, import of food and live animals remained 19 percent higher than the export. Similarly, import of animal, vegetable oil and fat was altogether 17 times of the total export of the same category. The import of tobacco and beverage is also higher than the export value. Export volume of animal and vegetable oil and fat has slightly increased after COVID-19 period.

6.2 Proposed National Strategies

In the background of the production, consumption, and foreign trade of the country coupled with existing industrial and trade policies, this study has developed following industrial strategies for the two key sectors of the economy: agricultural and pharmaceutical products. These recommended strategic measures are on top of what the country's industrial strategies have already covered. More specifically, the agricultural sector strategies are further divided for three periods: short-term (1-3 years), medium -term (3-10 years) and long-term (10-25 years).

Short-term strategies

Vegetables

Majority of the farmers engaged in vegetable farming are subsistence farmers; they require quality inputs, information, and technology to expand their farming. The quality inputs refer to the goods and services from the plantation upto distribution. So long as the information is asymmetrical in between demand and supply sides either producers or final consumers are exploited. Poor information chain and market connectivity need to be addressed, particularly in case of vegetable and fruit products because of their perishable nature. Use of technology might help in this regard, i.e. cell phone networking between producers' and wholesalers' groups would make symmetrical inflow flow of information in both demand and supply sides and the role of mediators would be minimized.

Scanty subsidies to farmers are the major causes for low production of vegetable items and are also the major threat to vegetable growers. Horticultural subsidies in India need to be taken into consideration for subsidies in Nepal as well. Subsidies to the agricultural producers for the establishment of cold-storage system is necessary; however, government's technical support deem essential for the monitoring of temperature and humidity.

Encroachment of land, and increasing real estate business land plotting are causing the loss of productive land and have caused the decline of growth potential of the fertile land suitable for

vegetable production, especially in the Kathmandu valley, Chitwan, etc. Agricultural, industrial and resettlement plans need to be harmonized in this regard.

Profit efficiency of farmers in terms of technical capacity/knowhow should get improved. Studies reveal high level of profit inefficiency in case of vegetable farmers in Nepal (28 percent level). Approximately two-thirds of this inefficiency is caused by technical, allocative and scale inefficiency which are all management problems. The remaining is caused by climatic conditions that require climate-friendly agriculture technology and adaptation. In order to reduce this level of profit inefficiency, some strategic measures deem necessary. The profit efficiency in vegetable farming can be enhanced by adopting improved seed varieties and control of hybrid and low-yield quality by the government, improving effective information and extension programmes, increasing accessibility of credit facilities to the farmers, developing market infrastructure, and empowering women farmers in vegetable farming that leads to improve household income and nutrition security. Nepal's seed dependency in terms of vegetable is nearly 95 percent. Hybrid seed should be banned; this has long-term negative impact on productivity. Local seeds need promotion based on research and innovation.

Livestock and dairy products

Establishment of dairy management information system to cover input, production, and market chain is essential. In this regard, establishment of National Dairy Marketing Intelligence Platform (NDMIP) and Local Dairy Marketing Intelligence Platforms (LDMIP) are required to discuss and interact/exchange business performance and experiences among the stakeholders. This strategy is crucial for enhancing dairy sector performance.

Animal Feed alone stands around 64% of total cost required for animal husbandry. High cost of production, especially on animal feed and high investment cost, uneven market access (limited number of farmers have easy access of big milk processors) are key challenges in production and marketing of animal feed and dairy products. Domestic industries producing animal feed are required. Market access strategies differ among products and across region. They need exploration by separate and detailed studies.

Medium-term strategies

Cereal crops

Nepal government fixes minimum support price to paddy (also that of some cash crops such as sugarcane); and this is basically applicable in Terai. Fixing minimum support price should be by the local government and this strategy should apply throughout the country. The major objective of this strategy will be for making the country self-sufficient in meeting overall rice consumption demand of the country. Marshi, Pokhareli, Jetho Budho, and Jorayel Basmati are some of the high

demand indigenous paddy varieties having better potential for increasing production and productivity. Besides, indigenous seeds are eco-friendly having better nutrients. Thus, in collaboration with local governments, promotion of indigenous seeds needs to be prioritized. They needed to have intellectual property right acquired by Nepal.

Ministry of Agriculture and Livestock Development, Nepal Agricultural Research Council, University of Agriculture and Forestry should be brought under the same umbrella for research and collaboration. Avoiding duplication of work and promotion of improved technology for higher productivity deem necessary in this regard. Expansion of the agricultural roads is highly recommended as it facilitates the market expansion of the agricultural products.

Fruits

High Hills, Mid Hills and Terai should specialize on the commercial production of 2--3 fruits in each of these geographical regions. One Village One Product campaign makes the fruit/agricultural markets widely fragmented; therefore, intensive production scheme with export potential of limited fruits deems necessary.

Agricultural technicians in the public sector working in district and municipality level should work longer in the given jurisdiction; it is because they need few years to develop knowledge on climatic conditions and adaptation of plants and livestock in the given environment and can provide better services to the farmers. Frequent transfer of them erodes this possibility. Presently, agricultural personnel without chance of developing local knowledge are transferred from one to the another place frequently. They do not get opportunity to specialise in one particular area which is a loss to the farmers and the agricultural sector as a whole.

Fertilizer

Nepal imports approximately three hundred billion Rupees worth of fertilizer, technology and agricultural equipment which has made its cost of production high. This needs gradual control. The subsidies need to domestic producers so long as the scope of domestic production exists to compete with imported fertilizer, technology, and agricultural equipment. In farm management, scientific use of wild biomass energy and municipal waste as an organic fertilizer deem necessary. Transfer of technology for cost-effective production of these organic fertilizer could enhance agricultural production and productivity.

Long-term strategies

Establishment of Land Bank in collaboration with local government was a good initiative of the government initiated through the budget speech of the FY 2019/20; however, it did not get momentum. It is expected to utilize the barren land suitable for cultivation. Alternative to land bank, co-operative farming is also very useful strategy where lands are fragmented and farmers

are small holders. Co-operative farming can pursue collective cultivation, harvesting, and marketing their products. Moreover, farmers can buy seeds, fertilisers, and machines such as tractors, harvesting and thrasher machines, etc. for common use. This strategy has dual benefits, minimization of risks and utilization of marginal lands.

Government of Nepal has brought Reintegration Programme Directive for Returnee Migrants 2022 with an objective of creating space for the migrant workers where they can utilize their experience and knowledge optimally; however, such initiatives have not yet in process on behalf of the government. These initiatives should be linked with the industrial strategies and promotion of agricultural activities. Likewise, Objective 7.5, clause 8.18 of the Industrial Policy 2067 has envisaged the establishment of an effective institution to facilitate acquiring intellectual property right, however, this has not yet been materialized so far. Initiative regarding this is recommended.

Nepalese diplomatic missions abroad should work with economic diplomacy to attract foreign investments in specific industrial activities that has the prospect of technology transfer, employment generation, and utilization of local raw materials. Regarding domestic investment, although property registration and issuing bank credit is relatively easy in Nepal, the lending interest rate is quite high and discouraging investment. This applies to agricultural and pharmaceutical industries as well. Bank lending interest rate on industrial activities should be lower than that in trading activities and this difference should prolong.

Proposed industrial strategies for pharmaceutical products

Expenditure on research and development is very minimal in Nepalese Pharmaceutical industries. In foreign established companies, it is around 20 percent of the industrial income of these activities. This is causing continuation of the import of pharmaceutical products for reliability even if the substitute Nepali products are available in the market. It is recommended to have a legal provision of making about five percent of their total annual turnover on research and development at the beginning and periodic growth thereafter.

Nepal Medicine Policy 2007 allows collaboration between Nepali and foreign companies to co-work for pharmaceutical sector. For attracting FDI, letting foreign companies to establish pharmaceutical companies in Nepal, creating favourable environment for Nepalese companies to collaborate with other branded companies around the world are some key strategies that will be conducive to export of medicine from Nepal. Foreign Investment and Technology Transfer Act 2019 has provisions of direct establishment of industries and technology transfer to them in Nepal. This provision can be instrumental for attracting FDI in this sector.

Provision of positive effective rate of protection to pharmaceutical products is warranted to ensure that the country has adequate value addition in the final products. However, the tariff rate to the raw materials for pharmaceutical industry is considered high whereas to the packaging

materials very low (13 vs. 1), which is discouraging the import of raw materials. Only nominal positive effective rate of protection arising from the import of intermediate products would be an effective strategy. Nepali pharmaceutical industries have high tax burden, i.e. custom and excise duties importing raw materials, packaging items, industrial equipment and technology, as well as VAT in sales and income tax on top of that, which demotivate him to increase production. While for the import of finished medical product, only five percent custom duty is levied. Government tax system for pharmaceutical companies is not business-friendly. It creates space for the imported medicine. Due to uneven tax policy, Nepali producers can hardly compete with Indian product. The tax policy, therefore, requires revision. Furthermore, Department of Industry discloses that Nepali drug companies have to pay 1500 USD as a registration fee to central drug laboratory of India for getting export permission while Indian companies pay only 50 thousand in Drug Administration to export medicine in Nepal. This differential treatment to exporters in two countries has been discouraging to Nepali exporters. GON should work for making them equal.

Overall, latest Doing Business Index (DBI) for Nepal shows that registration for the industry, registering the property, and getting credit is relatively easier in Nepal; however, doing business and paying taxes are quite difficult in Nepal. Service delivery of the government regarding this should be simplified.

More than one-third of drugs produced in India do not meet minimum standard; out of this 20 percent drug is sold illegally (Ibid). This alarming picture shows that Nepal (especially the Terai region) has become the hot spot for illegal drug supply. Ministry of Industry, Trade and Supply (especially Department of Industry) should make joint monitoring team with Nepal Drugs Limited for periodic market survey to control this problem. Safeguard, Anti-Dumping and Countervailing Act 2019 needs effective implementation; this has become more crucial now.

Public hospitals should have a directive to prescribe Nepalese pharmaceutical products even if the prices of them are upto 10 percent higher compared to the imported products so long as the qualities of the former are controlled.

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Appendix

Table A1: Situation of domestic production, import and total consumption of major importable medicines

Annual consumption (demand and supply) of major pharmaceutical products in Nepal (Year 2020)							
Sn	Name of the product/ molecule	Dosage form	National Demand, Production and Import			% of National Market Consumption	Import deficit (%)
			Total consumption	total import	national industry		
1	Aceclofanac	Tablets/syrups/capsules	33900	8900	25000	0.74	0.26
2	Alprazolm	Tablets	6750	1750	5000	0.74	0.26
3	Amlodipine	Tablets	140000	45000	95000	0.68	0.32
4	Amozycillin	Capsule/Tablet/Suspension	36500	11650	24850	0.68	0.32
5	Amoxycillin and clavuanic acid	Capsule/Tablet/Suspension	3528235	1226	2301	0.65	0.35
6	antacid containing Aluminium, Magnesium salts	Tablet/suspension	5500	1078	4421	0.80	0.20
7	Anticold tablet(PCM Combination)	Tablet/Capsule/syrup	15000	3175	11825	0.79	0.21
8	Atrovastatin	Tables(5,10,20 mg tablets)	15700	6000	9700	0.62	0.38
9	Azithromycin	Capsule/Tablet/Suspension	50000	13930	36070	0.72	0.28
10	Cefexime	Oral dosage form (Tablets/Suspension)	3035	950	2085	0.69	0.31
11	Cefodoxime	Tablets/syrups/capsules	15000	6050	8950	0.60	0.40

12	Cetrizine	Tablets/suspension	41600	17500	24100	0.58	0.42
13	Cough Preparation containing approved combination	Tablets/capsule/syrup	5000	1050	3950	0.79	0.21
14	Diclofenac	Capsule/Tablet	23700	3750	19950	0.84	0.16
15	Diclofenac and dielthalamine	Capsule/Tablet	45000	13900	31100	0.69	0.31
16	Diclofenac Potassium/sodium	Capsule/Tablet	23700	8750	14950	0.63	0.37
17	Dicyclomine HCL	Tablet/Syrup/Capsules	39500	7250	32250	0.82	0.18
18	Drotaverine	Tablets (40 mg and 80 mg)	2091	350	1741	0.83	0.17
19	Enzyme preparation containing approved combination	Tablets/capsule/syrup	7500	1535	5965	0.80	0.20
20	Escitaloprm	capsule/tablet	3012	676	2336	0.78	0.22
21	Fexofenadine	Tablet/Syrup/Capsules	17500	3028	14472	0.83	0.17
22	Flueconazole	Tablet/capsule	3500	725	2775	0.79	0.21
23	Gabapentine	Tablet, capsules	2500	1089	1411	0.56	0.44
24	Hyoscine Butybromide	Tablets	5500	750	4750	0.86	0.14
25	Indomethacin (immediate release)	Capsule	1800	100	1700	0.94	0.06

26	Itopride	Tablet/Capsule	5000	1189	3811	0.76	0.24
27	Itraconazole	Tablet/capsule	13250	2518	10732	0.81	0.19
28	Levocetrizine	Tablet/suspension	45600	15000	30600	0.67	0.33
29	Losartan Potassium	Tablets (25, 50 mg table)	55000	20000	35000	0.64	0.36
30	Mefenemic Acid	Tablets, Capsules	2250	639	1611	0.72	0.28
31	Metformin	Tablets	81583	20000	61583	0.75	0.25
32	Metformin and combination with Glimepiride	Tablet	20500	5500	15000	0.73	0.27
33	Metformin and combination with Sitagliptin	Tablets	16500	1500	15000	0.91	0.09
34	Metronidazole	Capsule/Tablets/Suspension	50000	7500	42500	0.85	0.15
35	Metronidazole +Diloxanide furoate	Capsule/Tablets/Suspension	15750	2538	13211	0.84	0.16
36	Multivitamins combination products	Tablets/capsule/syrup	50000	10850	39150	0.78	0.22
37	Nimesulide	Tablets	36800	6000	30800	0.84	0.16
38	Omeprazole	capsule/tablets	67500	1750	5000	0.07	0.93
39	Oral rehydration salts containing approved composition	sachet (power for solution)	46500	14500	32000	0.69	0.31
40	Ornidazole	Tablets/capsule/syrup	3100	763	2337	0.75	0.25

41	Pantoprazole	Capsule/Tablets	87200	27500	59700	0.68	0.32
42	Paracetamol	Capsule/Tablets/Suspension	106158	30000	76158	0.72	0.28
43	Paracetamol +Chlorozoxazone	Tablets	6000	250	5750	0.96	0.04
44	Paracetamol+Ibuprofen combination	Tablets/suspension	70000	21500	48500	0.69	0.31
45	Pregabalin	Tablet/Capsules	24250	5600	18650	0.77	0.23
46	Rabeprazole	Capsule/Tablets	36500	7500	29000	0.79	0.21
47	Ranitidine	Capsule/Tablets	27500	8750	18750	0.68	0.32
48	Rosuvastatin	Tablet/Capsule	16750	587	10875	0.65	0.35
49	Sitagliptin	Tablets	41000	11500	29500	0.72	0.28
50	Spironolactone and combination with frusemide	Tablets	425	162	263	0.62	0.38
51	Telmisarton	Tablets/capsules	6000000	22500	3750	0.63	0.38
52	Tinidazole	Tablets	4750	1500	3250	0.68	0.32
53	Tizanidine	Tablets	1500	150	1350	0.90	0.10
54	Semisolid Preparation	Tube/semi solid	6800	2340	4460	0.66	0.34
	Total		**1490985**	**390001**	**1034946**	**0.73**	**0.27**

Source: Association of Pharmaceutical Producers of Nepal, 2020.

Appendix A2

A2.1 Checklist for the interview with the ministry officials

1. **Policy harmonization**

    a. Coherence in policies, strategies and laws related to Nepal's international trade, and the industrial activities

    b. Degree of coordination among government agencies (i.e., ministry of finance, ministry of agriculture and ministry of industry, commerce and supplies)

    c. Co-ordination among government Ministries and their subordinate bodies, for example, how Ministry of Agriculture and Livestock, Department of Agriculture, and Tea and Coffee Development Board are coordinating to promote tea and coffee? Are the strategies taken by these agencies supporting each other?

    d. How Prime Minister Agriculture Modernization Project and related agro- agencies are coordinating?

    e. Co-ordination between Dairy Development Corporation and Ministry of Agriculture in terms of policy co-ordination

    f. Co-ordination with private sector in trade-related decision making, including policy formulation and implementation

    g. Co-ordination among Ministry of Industry, Department of Drug Administration, and other private pharmaceutical associations i.e., Association of Pharmaceutical Producers of Nepal (APPON), Drug Importers Association, etc.

    h. Co-ordination among private sector agencies

    i. Co-ordination between fiscal and monetary policy in terms of promoting agricultural and pharmaceutical production and import substitution

2. **Developing human efficiency in agricultural sector**

    a. Developing human efficiency in increasing decisive and technical power of farmers and farmer groups in negotiating with foreign trade partners.

3. **Policy Issues and implementation mechanism**

    a. What are the problems in implementing government policy in raising domestic production and promoting export?

    b. Identifying comparative and competitive advantages of agro-based products

    c. Political economy of land use and its impact in import substitution

    d. Complementarity between periodic plan, budget speech and government's working policies in promoting export of agro and pharmaceutical products

4. **Economic diplomacy for import substitution and export promotion**

a. What might be the ways to promote the demand of domestic product

b. Ways of rising investment in domestic production

A2.2 Persons consulted/interviewed

1. Prajwal Jung Pandey, President, APPON
2. Suraj Bhattarai, Managing Director, Grace Pharmaceuticals (Ayurvedic), Rupendehi
3. Deepak Prasad Dahal, Past President of Association of Pharmaceutical Producers of Nepal
4. Biplap Adhikari, Managing Director, Innovative Pharma Lab
5. Pawan Acharya, General Secretary, Medicines Importers Association of Nepal
6. Uddav Adhikari, Food and Agricultural Campaign, Coordinator
7. Dr. Yubak Dhoj GC, Agro Expert, Former Secretary, Ministry of Agriculture and Livestock Development
8. Dipak Khanal, Director, Nepal Tea and Coffee Development Board
9. Suyash Khanal, Executive Director, Trade Promotion Center
10. Krishna Raj Bajgain, Senior Officer, Trade Promotion Center
11. Mr Tek Bahadur Thapa, Chairman, Nepal Dairy Science Association
12. Balak Chaudhari, General Secretary, Nepal Dairy Science Association
13. Niranjan Timelsina, NDSA.
14. Yuvaraj Gurung, Executive Director, Agro Manang.

Appendix A3

Table A4: Cow and buffalo milk production in Nepal

Fiscal Year	Cow Milk	Buff Milk
2011/12	468913	1153838
2012/13	492379	1188433
2013/14	532300	1167773
2014/15	587719	1168006
2015/16	643806	1210441
2016/17	665285	1245954
2017/18	754126	1338277
2018/19	795530	1372905
2019/20	920400	1380600
2020/21	1060487	1419412

Source Department of Agriculture and Livestock 2021/22, Production in Mt.

Appendix B

Subsidy for Horticulture in India

Horticulture is a branch of agriculture that deals with the art, science, technology, and business of plant cultivation. Although horticulture is a division of agriculture which deals with plant gardening, it is actually different from agriculture. Further, horticulture strictly involves plant cultivation while agriculture deals with the cultivation of crops as well as animal farming. Also, horticulture is usually done on smaller, enclosed plots while agriculture is done on extensive pieces of land on a large scale. In India, horticulture is promoted by the National Horticulture Board (NHB). In this article, we look at the subsidy for horticulture in India.

National Horticulture Board (NHB)

National Horticulture Board (NHB) was set up by the Government of India in 1984 as an autonomous society under the Societies Registration Act 1860. The objectives of the National Horticulture Board are the development of hi-tech commercial horticulture, development of modern post-harvest management infrastructure, promotion, market development of fresh horticulture produce and more. To promote horticulture in India, the National Horticulture Board provides a number of subsidies

Subsidy for Horticulture in Open Field

The National Horticulture Board provides a subsidy for commercial horticulture development in open field conditions, including the components of planting material, plantation, irrigation, fertigation, precision farming, GAP, etc. The estimated cost of the horticulture project is Rs.75 lakh per project (Rs.125 lakh for date palm, olive and saffron) for projects covering an area of more than 2 ha.

For such projects, the scheme implemented by the State **Horticulture Mission** provides credit linked back-ended subsidy at 40% of project cost limited to Rs.30 lakh per project in the general area. The credit linked back-ended subsidy provided increases to 50% of project cost limited to Rs.37.50 lakh for NE and hilly and scheduled areas. Societies and other organisation obtaining grants-in-aid are eligible to avail this subsidy.

Subsidy for Horticulture in Protected Cover

The National Horticulture Board provides a subsidy for commercial horticulture development in protected cover conditions, including the components of planting material, plantation, irrigation, fertigation, precision farming, GAP, etc. The scheme assists development of commercial horticulture in protected cover @ Rs.112 lakh per project covering an area of above 2,500 sq. mt.

For such projects, the scheme implemented by the State Horticulture Mission provides credit linked back-ended subsidy at 50% of cost limited to Rs.56 lakh per project. Societies and other organisation obtaining grants-in-aid are eligible to avail this subsidy.

Subsidy for Post- Harvest Management Projects

The National Horticulture Board provides a subsidy for setting up integrated post-harvest management projects: e.g., packhouse, ripening chamber, refer van, retail outlets, pre-cooling units, primary processing, etc. The scheme provides assistance for projects costing less than Rs.145 lakh per project: The add-on components of pre-cooling, packhouse, grading, packing, cold room are individual components.

For such projects, the scheme is implemented by the State Horticulture Mission provides credit linked back-ended subsidy at 35% of cost limited to Rs.50.75 lakh per project. In general areas, the scheme provides subsidy at 50% of project cost limited to Rs.72.50 lakh per project in NE, hilly and scheduled areas. Societies and other organisation obtaining grants-in-aid are eligible to avail this subsidy.

(For detail, see the link: https://www.indiafilings.com/learn/subsidy-for-horticulture-in-india/)

Appendix C

Projected growth rate, production, and investment in agricultural products

	2020/21	21/22	22/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2042/43
Growth rate											
Cereals	1.670	1.84	2.02	2.22	2.6	2.9	3.4	3.9	4.5	5.14	5.91
Pulses	-2.4	2.16	2.38	2.61	2.87	3.16	3.48	3.83	4.21	4.63	5.09
Diary Product	7.7	8.47	9.32	10.25	11.27	12.40	13.64	15.01	16.51	18.16	19.97
Meat	-1.7	1.53	1.68	1.85	2.04	2.24	2.46	2.71	2.98	3.28	3.61
Vegetable	0.8	0.86	0.94	1.04	1.14	1.26	1.38	1.52	1.67	1.84	2.02
Fruits	8.5	9.37	10.31	11.34	12.47	13.72	15.09	16.60	18.26	20.09	22.10
Fishery	10.1	11.15	12.27	13.50	14.85	16.33	17.96	19.76	21.74	23.91	26.30
Edible oil	3.1	3.44	3.79	4.17	4.58	5.04	5.54	6.10	6.71	7.38	8.12
Production											
Cereals	10381.6	10572.30	10785.93	11025.68	11307.52	11639.91	12033.41	12501.22	13060.13	13731.60	14543.50
Pulses	397.14	405.72	415.36	426.21	438.47	452.33	468.07	485.98	506.44	529.88	556.87
Diary Product	2479.9	2689.95	2940.57	3241.94	3607.42	4054.78	4607.89	5299.31	6173.99	7294.96	8751.89
Meat	520.74	528.71	537.61	547.56	558.71	571.22	585.30	601.16	619.09	639.39	662.46
Vegetable	3993.17	4027.43	4065.44	4107.65	4154.56	4206.75	4264.88	4329.70	4402.10	4483.06	4573.76
Fruits	1360.83	1488.37	1641.81	1827.99	2056.01	2338.13	2691.04	3137.84	3710.91	4456.42	5441.23
Fishery	104.62	116.29	130.56	148.18	170.18	197.97	233.53	279.67	340.46	421.87	532.82
Edible oil	287.04	296.92	308.17	321.01	335.72	352.64	372.19	394.90	421.39	452.49	489.23
Investment											
Cereals		629.3	705.0	791.2	930.1	1096.9	1298.5	1543.8	1844.4	2215.9	2679.3
Pulses		28.3	31.8	35.8	40.4	45.8	51.9	59.1	67.5	77.4	89.1
Diary Product		693.2	827.1	994.5	1206.1	1476.3	1825.3	2281.7	2886.5	3699.2	4807.9
Meat		26.3	29.4	32.8	36.8	41.3	46.4	52.4	59.1	67.0	76.1
Vegetable		113.1	125.4	139.3	154.8	172.2	191.8	213.9	238.9	267.2	299.3
Fruits		420.9	506.3	614.4	752.5	931.0	1164.6	1474.4	1891.1	2460.2	3249.9
Fishery		38.5	47.1	58.1	72.6	91.7	117.4	152.3	200.6	268.6	366.1
Edible oil		32.6	37.1	42.4	48.5	55.8	64.5	74.9	87.4	102.6	121.2

Note: Growth rate is percentage, production in thousand metric ton, and investment in crore.