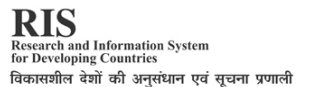


Scoping Study of Agriculture Development Strategy of Nepal (ADS) (Five-year achievements)

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FOOD SECURITY POLICY RESEARCH, CAPACITY, AND INFLUENCE (PRCI) RESEARCH PAPERS

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ABBREVIATIONS

ADS	Agriculture Development Strategy
ADS ISU	Agriculture Development Strategy Implementation Support Unit
ADS JSR	Agriculture Development Strategy Joint Sector Review
AEPC	Alternative Energy Promotion Centre
AGDP	Agricultural Gross Domestic Product
AICL	Agriculture Inputs Company Limited
APP	Agriculture Perspective Plan
ASDP	Agriculture Sector Development Priority
ATF	ADS Implementation Trust Fund
BMI	Body Mass Index
CADIC	Central Agriculture Development Implementation Committee
CAESC	Community Agriculture Extension Service Center
CARD	Contribution to Agriculture and Rural Development
CBS	Central Bureau of Statistics
CCDABC	Centre for Crop Development and Agrobiodiversity Conservation
CSISA	Cereal Systems Initiative for South Asia
DADC	District Agricultural Development Committee
DAP	Diammonium phosphate
DoA	Department of Agriculture
DWRI	Department of Water Resources and Irrigation
EU	European Union
FANSEP	Food and Nutrition Security Enhancement Project
FAO	Food and Agriculture Organization
FNSP	Food and Nutrition Security Plan of Action
FY	Fiscal Year
GDP	Gross domestic product
GESI	Gender Equality and Social Inclusion
GFSI	Global Food Security Index
GHI	Global Hunger Index
GoN	Government of Nepal
Ha	Hectare
ICT	Information and Communication Technology
IFPRI	International Food Policy Research Institute
IWMI	International Water Management Institute
KII	Key Informant Interview
KISAN	Knowledge-based Integrated Sustainable Agriculture and Nutrition
MoFA	Ministry of Foreign Affairs
MoALD	Ministry of Agriculture and Livestock Development
MoEWRI	Ministry of Energy, Water Resources and Irrigation
MoF	Ministry of Finance
MoFE	Ministry of Foreign Employment
MoHP	Ministry of Health and Population
MoICS	Ministry of Industry, Commerce and Supplies
MoLCPA	Ministry of Land Management, Cooperatives and Poverty Eradication

MoLMAC	Ministry of Land Management, Agriculture and Cooperatives
MT	Metric ton
NDC	Nationally Determined Contribution
NADSCC	National ADS Coordination Committee
NADSIC	National ADS Implementation Committee
NARC	Nepal Agricultural Research Council
NLISP	Nepal Livestock Sector Innovation Project
NLSS	Nepal Living Standards Survey
NMICS	Nepal Multiple Indicator Cluster Survey
NPC	National Planning Commission
NPR	Nepalese Rupee
NSAF	Nepal Seed and Fertilizer
NRB	Nepal Rastra Bank (Central Bank)
PADS	Provincial Agriculture Development Strategy
PAF	Poverty Alleviation Fund
PM-AMP	Prime Minister Agriculture Modernization Project
PSLP	Priority Sector Lending Programme
RADC	Regional Agriculture Development Committee
REED	Rural Enterprise and Economic Development Project
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goals (SDGs)
SQCC	Seed Quality Control Centre
SRR	Seed Replacement Ratio
STCL	Salt Trading Corporation Limited
TCF	Technical Cooperation Facility
USAID	United States Agency for International Development
VCDP	Value Chain Development Project
VDC	Village Development Committee

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INTRODUCTION

The Agriculture Development Strategy (ADS) (2015-2035) is the major initiative of the Government of Nepal (GoN). It is the follow-up document of the 20-year-long Agricultural Perspective Plan (APP) (1995-2015), aimed at developing the overall agricultural sector, with spending estimated at nearly NPR 510 billion. The ADS was endorsed with five dimensions such as increased food and nutrition security, poverty reduction, competitiveness, higher and more equitable income for rural households, and strengthened farmers' rights. This strategy emphasizes agricultural transformation by providing services to the communities that depend on agriculture, which is expected to transfer their skills to industrial sectors and generate greater income (Paudel et al., 2016).

ADS has analyzed the causes contributing to the failure of APP, identification of targets, and indicators for the quantification of the attainment of the identified targets. It is hoped to be a milestone in transforming the spectrum from subsistence to commercialization. It was introduced at a crucial time when the country was ready to come up with a new federal transformation.

ADS is a living strategy, and through continuous monitoring and review, it is expected to continuously evolve and improve. Hence, this scoping will support the government in the revision plan of ADS review from ministry level soon. It also aims to analyze the prospective challenges of ADS, followed by its execution.

The monitoring and evaluation plan of ADS clearly stated a review would be done over a five-year period. However, due to various external and internal factors, the target has not been accomplished due to the structural reformation that occurred in 2015 and COVID-19 lockdown. Hence, this scoping study is carried out with the goal of assessing ADS's achievements.

This study aims to illustrate the achievements and progress of ADS in five years and the corresponding strategy government, especially the Ministry of Agriculture and Livestock Development (MoALD) has been adopting in the country's new federal system. Whether the three-tiered governments are adopting ADS or not; what their challenges are, and what progress has been made.

This research report is expected to be substantial for other ministries, such as the Ministry of Energy, Water Resources and Irrigation (MoEWRI), and the Ministry of Land Management, Agriculture and Cooperatives (MoLMAC), among others. The research tracking progress is likely to contribute to policy gaps as well as be useful in potential policy formulation in agricultural transition.

#

OBJECTIVES AND METHODS OF THE STUDY

1.1 Objectives

As guided by the need and the significance of the study, the main objectives of this study are to identify the present scenario of ADS in terms of outcome, and the emerging challenges, and to provide recommendations to address the emerging challenges within the context of Nepal’s agricultural sanctuary and evolving federalism.

1.2 Research Methods

The adopted methodology for this study is based on qualitative and quantitative information provided by both government and non-government agencies at the central and regional levels and is largely a review of documents, government data, and publications.

Initially, a desk review of the agriculture development strategy and other materials was done. After this, the major stakeholders were identified who are directly involved in the planning and implementation of ADS, and then detailed Key Informant Interviews (KIIs) were administered to understand the current situation, feedback, and suggestions. Table 1 shows the methods and sources from which the required data were gathered.

Table 1. Methods and Data Sources

Data types	Methods	Sources
Primary	Key Informant Interviews (Central level)	Department of Agriculture (DoA), MoALD, Nepal Agricultural Research Council (NARC), MoEWRI, Ministry of Land Management, Cooperatives and Poverty Eradication (MoLCPA), National Planning Commission (NPC), Department of Water Resources and Irrigation (DWRI), CCDAC, Prime Minister Agriculture Modernization Project (PM-AMP), Knowledge-based Integrated Sustainable Agriculture and Nutrition (KISAN), Nepal Seed and Fertilizer (NSAF), and Agriculture Inputs Company Limited (AICL).
	Provincial level interactions	The provincial MoLMAC.
Secondary	Literature review	MoALD annual report, Central Bureau of Statistics (CBS) publications, DoA publications, relevant documents of NARC, Nepal Rastra Bank (NRB), and other available sources.

This study analyzed the preliminary five-year target set by ADS and the current status of outcome-level indicators, their policies, and the regulations needed for implementation. Efforts were made to look into the status of various sectors, such as productivity of major agricultural commodities; input systems such as seed sectors, irrigation, and fertilizers; infrastructure: farm mechanization and

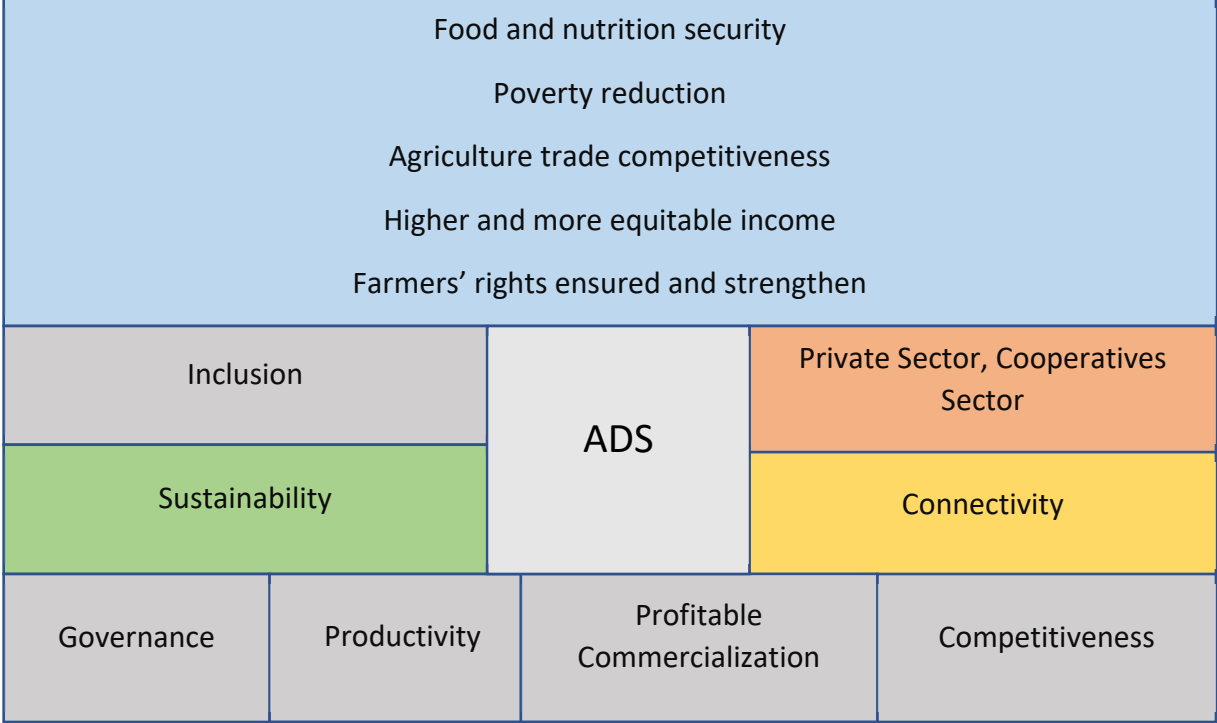
technological changes; food and nutritional security; agribusiness, marketing, value chain and trade; agricultural finance, subsidies, budget vs. expenses vs. programs status; cross-cutting themes such as climate change, and social inclusion; and MoALD policies, etc.

OVERVIEW OF ADS

Addressing the issues of the agricultural sector in Nepal is a complex process. Multiple factors need to be addressed. ADS is designed with the expectation of leading and guiding the complexity of the agriculture and agribusiness sectors of the country. Hence, the document is formulated with a subject-specific analysis of which causes contributed to the failure of APP and the identification of targets and indicators for the quantification of the attainment of the identified targets. It covers all the aspects required for the development of agriculture in Nepal. It is envisioned to lead the country toward a self-reliant, sustainable, competitive, and inclusive agricultural sector that drives economic growth and contributes to improved livelihoods and food and nutrition security, leading to food sovereignty.

ADS is designed to achieve its vision for accelerating agricultural sector growth through four strategic components related to governance, productivity, profitable commercialization, and competitiveness while promoting inclusiveness (both social and geographic), sustainability (both natural resources and economic), development of the private sector and cooperative sector, and connectivity to market infrastructure (e.g., agricultural roads, collection and packaging centers, market centers), information and communication technology (ICT), and power infrastructure (e.g., rural electrification, renewable and alternative energy sources). Figure 1 provides an illustration of the strategic framework of the ADS.

Figure 1. Strategic Framework of the Agricultural Development Strategy



Source: ADS final report.

The ADS was implemented through three different types of programs: the Core Programs, the Flagship Programs, and Other Programs. The Core Programs are implemented mostly through existing agencies already in place at the ministry levels or department level. The Flagship Programs, on the other hand, require different management structures in view of the innovative and multisectoral nature of their activities. Other programs are those that are currently implemented but are not part of the existing Flagship or Core Programs.

ADS TARGET VS. ACHIEVEMENTS

An attempt was made to look into the roadmap designed for ADS implementation. As mentioned in the ADS final report, for it to be successfully implemented, some conditions have to be satisfied. Let's understand the present scenario of those roadmaps in the following section.

Government commitment

The study found that the government of Nepal, especially the MoALD and the NPC, are committed to its implementation. However, the roles and responsibilities of MoALD have been transformed after the restructuring of the government system, which resulted in weakening the commitment and slowing the process. The central government is mostly given the task of monitoring and planning, and decision-making power and responsibility have been shifted towards the provincial and local governments, with some exceptions.

The majority of program/project implementation responsibilities have been delegated to local governments, but it has taken some time for them to become fully operational, particularly in the agriculture sector. Thus, adjusting the ADS as per the federal system and cascading it to the provinces and local governments is critical.

The dissatisfaction with the ADS formulation process among government agencies may also have had a negative impact. The concerned agencies, for example, DoA, MoEWRI, and other private sectors, noted that it was developed without wider consultation, which resulted in a lack of full ownership and commitment.

Nepal was under the unitary system when ADS was formulated; hence, the implementation arrangement was also guided by this unitary system, without consideration for the nation's transition to a federal structure. The resultant mediocre performance so far is a transition to a federal system from a unitary system, which is delaying the implementation process. As per the constitution of the country, all three tiers of government are generally independent to enjoy their respective rights enshrined in the constitution, barring some clauses pertinent to matters of national importance, for which lower-level governments should follow the central government's policy and directives. After the promulgation of the constitution, the first elected government at the provincial and local levels had to spend substantial time and effort formulating sectoral policies and regulatory frameworks. They were also overwhelmed by the demands and aspirations of the people. Therefore, agriculture in general and ADS implementation in particular seemingly could not get due priority during most of the tenure. In many cases, a lack of ownership by lower-level governments for ADS was found, prompting no translation of ADS in their respective annual plans. Moreover, the lack of coordination mechanisms between the three tiers of government hindered collaboration with the lower-level governments in ADS implementation. Despite being a multilateral document addressing the concerns of several ministries, including MoEWRI, MoLCPA, MoALD, and MoFE, proper implementation in coordination with line ministries has not occurred.

While stating that the provincial government has recently begun the development process of the Provincial Agriculture Development Strategy (PADS) in accordance with the original documents. MoALD has been supported by the European Union (EU) through the Technical Cooperation Facility (TCF) for the ADS implementation under the EU's broad framework entitled "Contribute to Agriculture and Rural Development (CARD)" in Nepal.

The EU TCF is facilitating the formulation of PADS in *Karnali, Gandaki, Bagmati, and Madhesh* Provinces, whereas *Koshi* Province is being supported by the Swiss Agency for Development and Cooperation (SDC), and the USAID-funded KISAN II project is supporting the same in *Lumbini* and *Sudurpashchim* Provinces. The *Sudurpashchim* Provincial Government has already approved its PADS, while other provinces are expected to follow suit sooner rather than later. Substantial time and resources have been devoted to formulating PADS. It is, however, yet to be seen to what extent those PADS have been aligned with ADS and how far they have been made workable amid the ongoing development discourse and priorities at the provincial level.

Policy and Regulations for ADS Implementation in place

Implementation of some specific policies and regulations is another important pillar of ADS; however, after six years of its endorsement, some of the policies and acts are still not in place. For example, a land act is an important step for land leasing and contract farming, which is believed to support agribusiness promotion. The government is hoping that it will be endorsed in 2023. Similarly, the Irrigation Act of 2019 is not still in the process of endorsement. In the paper, the five-year plan seems to focus on agribusiness promotion, but in reality, the situation remains the same. Almost all stakeholders mentioned that there was a lack of coordination during the implementation phase, which indicates that there is very little consensus among them. All the stakeholders are doing their jobs as per their own guidelines and mandates, which are basically guided by the interim constitution of Nepal. There are only a few activities being done with coordination and consensus. There has been no such change or mandatory instruction in accordance with ADS guidelines.

Government stakeholders believe that every activity that the agriculture department does can be linked to some target in the ADS, but in reality, hardly any activities are aligned with the goals outlined in the ADS.

A number of policy and institutional changes have been made, and new programs and initiatives have been started since the beginning of ADS implementation. For example, the Food and Nutrition Security Plan of Action (FNSP) is a kind of complementary document that aims to ensure that the poorest households, as defined by the Poverty Alleviation Fund (PAF), benefit from the programs and policies stipulated in the ADS. Likewise, progress has been made in setting up supportive institutional structures such as the National Farmers' Commission and the ADS Joint Sector Review (JSR) Mechanism. Program managers (MoALD) were appointed for each of the four ADS flagship programs. Some activities under each of the Flagship Programs were also implemented. However, flagship managers are not very active these days, and there are no regular flagship programs either.

A number of projects have started after ADS's implementation in line with its vision and framework. Some of the major projects include the Agriculture Sector Development Program (ASDP), Food and

Nutrition Security Enhancement Project (FANSEP), Nepal Livestock Sector Innovation Project (NLISP), Rural Enterprise and Economic Development (REED) Project, and Value Chain Development Project (VCDP). Some small-scale and technical cooperation projects have also been started, with some of them already completed. Some other initiatives include:

- Formation of various committees envisaged in the ADS
- Formation of the ADS Joint Sector Review Committee
- NARC Restructuring Committee was formed and the report was submitted
- Updating of ADS-relevant agriculture databases
- Draft of a regulatory framework for the operation of the ADS Trust Fund has been prepared.

Development partners' support

The government of Nepal and the interim constitution of Nepal have a clear mandate that all development partners should be in line with government policy and guidelines. A large number of donors are contributing to Nepal's agriculture; however, the effectiveness of their investment is in question.

ADS OUTCOMES VS. ACHIEVEMENTS

In this section, an effort has been made to look at the target of ADS and the current state of achievement. The first and foremost effort was made on scoping four main outcome indicators, which are: improved governance, higher productivity, profitable commercialization, and increased competitiveness. ADS has outlined some basic policies and regulations for each outcome level indicator and has set a target for them. The following table shows the policies and regulations, their current implementation status, and their applicability in the present setup. The Improved Governance outcome indicator has eight identified regulations, of which four were established and functional but the remaining four were not. Two of them totally did not exist as they are not applicable in today's federal context, and the remaining two were in dissatisfactory condition due to political influences and instability.

Higher productivity outcomes were supposed to be backed up by four different policies and regulations, but only one of them is in the process of execution, which is the inclusion and initiation of the agribusiness department in most agricultural universities. Other very important regulations, such as the establishment of a community agricultural extension service center, the restructuring of NARC, and a voucher for extension and inputs, have not yet been initiated. The government official argues that an effort has been made to establish local-level service centers stationed at each local government office as Community Agriculture Extension Service Centers (CAESC). However, no initiation has been taken for the restructuring of the NARC, the reason being that the government has not provided any logistics or financial support; similarly, the MoALD also seems reluctant to establish a voucher system for extension and inputs. The Land Leasing Act is an issue for major political initiatives that have been taken but are still not fully launched.

Table 2. Target vs. Achievement of Policies and Regulations required for the implementation of ADS

Headings	Achievements (2022)
1. Governance	
1.1 ADS Implementation Support Unit (ADS ISU)	It has been established and functional
1.2 Composition of National ADS Coordination Committee (NADSCC) and Sub-committees	It has been established and functional
1.3 Composition of Central Agriculture Development Implementation Committee (CADIC), Regional Agriculture Development Committee (RADC), District Agricultural Development Committee (DADC)	Does not exist as it is not meaningful in new federal system
1.4 ADS Information desks	It has been established and functional
1.5 Establishment of the National ADS Implementation Committee (NADSIC)	It has been established and functional
1.6 ADS Implementation Trust Fund (ATF)	It does not exist as it was paused by the government
1.7 Tenure of key positions	As every political change directly effects on the tenure, this is not stable (highly unstable)
1.8 Farmers' Commission	It has been established but has influence from political parties
2. Productivity	
2.1 CAESC	Does not exist
2.2 NARC restructuring	No progress has been made, as no fund is available
2.3 Department of Agribusiness, Agricultural University and Colleges	Most agricultural college and university have started the department of Agribusiness
2.4 Vouchers for extension and input	No, the government has not initiated it. But one VCD in <i>Makwanpur</i> has initiated this program in their own effort
2.5 Land Leasing	No, the government is making effort on this to start up
3. Commercialization	
3.1 Contract farming	Not much progress has been made, the land act to support this still in the process of endorsement
3.2 Value Chain Development Alliances	No, it has not been initiated
3.3 Crop and livestock Insurance regulations	Yes, this has been one of the successful programs
3.4 New Financial Products	Some progress has been made
4. Competitiveness	

4.1 Innovation Funds	Very few
4.2 Quality and Safety regulations	It has been established
4.3 Food safety law	It has been established

Improving and upgrading the commercialization of agriculture in Nepal needs support to increase the occurrence of contract farming; establishing the value chain development alliance; providing crops and livestock insurance; and increasing the availability of financial support are the major pillars identified by ADS. But, except for the provision of crop and livestock insurance, none of the others are in the process of being brought on board.

Last but not least, the innovation fund, quality and safety regulation, and food safety law have been identified as regulations to increase competitiveness. The government approved the Food Safety Policy and brought it into action in June 2019, including safety regulations and food safety laws. However, the proper implementation is still a matter of question due to the lack of infrastructure, human resources, and regulations to monitor, control, and support organizations.

Overall, it has become clear that most of the important regulations and policies required for the achievement of outcome indicators are not in place, which has a serious impact on achieving the target eventually for the production and productivity of agriculture in the country. In total, there are 20 different policies and regulations that were expected to be established or launched; however, only eight have been initiated or put forward.

ADS is envisioned as having a self-reliant, sustainable, competitive, and inclusive agricultural sector that drives economic growth and contributes to improved livelihoods and food and nutrition security, leading to food sovereignty. Some specific indicators have been identified for the vision components, which are crucial for measuring the achievement of ADS.

ADS has identified sixteen specific indicators from these seven vision components. This study made an effort to glance into the state of achievement of these indicators by 2020/21 (the ADS five-year target). Our observation revealed that only a few of them are achieved. The targets set for forest coverage, the percentage of farmers reached by agriculture programs, the percentage share of agribusiness in Gross Domestic Product (GDP), the percent of land owned by women or in joint ownership, and the amount of organic matter in the soil were achieved. Whereas, other very crucial indicators such as food self-sufficiency, irrigation, the agriculture trade balance, the annual growth rate of Agriculture Gross Domestic Product (AGDP), and poverty in the rural areas are far from the target.

Table 3. Achievement of ADS in five years' time since its implementation

Visio n Comp onent	Indicators	Situatio n (2010)	Target Short Term (5 Years) 1	Achievement 2020/21	Source of data
Self-reliant	Self-sufficiency in food grains	Currently 5% trade deficit in food grains	0% trade deficit in food grains	14.59% trade deficit	(MoALD, 2019/20, and MoF, 2020/21a)
Sustai nable	Year-round irrigation	18%	Covera ge 30%	17% of cultivated land is irrigated throughout the year	(Poudel, 2019)
	Soil organic matter	1%	2%	2.5-3%	(NARC, 2022)
	Ha degraded land	3.2 million ha	2.88 m ha	n.a.	-
	Forest cover	40%	40%	44.6%	(MoF, 2020/21a)
	Agricultural land productivity (AGDP/ha)	\$ 1,804	\$ 2,302	\$ 3,510	(MoF, 2020/21a)
	Agribusiness as % GDP	10%	12%	9.78% ²	(MoF, 2020/21a)
Comp etitive	Agricultural trade balance	Trade deficit \$ 350 million	Trade deficit \$ 310 million	\$ 2.01 billion Trade deficit	(MoF, 2020/21b)
	Agricultural Exports	\$ 248 million	\$ 418 million	\$ 394 million ³ to \$ 705 million ⁴	(BACI dataset, 2015 to 2019; and MoF, 2019/20c)
Inclusi ve	% of farmland owned by women, or joint ownership	10%	15%	19.50%	CBS (2020) ⁵
	% of farmers reached by agricultural programs	12%	17%	20%	MoALD (2017/18)
Grow th	Average annual growth of AGDP	3%	4%	2.64%	(CBS, 2020)
	AGDP/ Agricultural labor	\$ 794	\$ 979	\$ 931	(MoF, 2020/21a)
Liveli hood	Poverty in rural areas	27%	21%	28%	Multidimensional Poverty Index (2020)

¹ Projected estimation from ADB. (2013). Technical Consultant's report.

² Projection by ADS JSR Team, based on ADS indicators.

³ BACI Dataset. (2015 to 2019).

⁴ (MoF, 2019/2020c).

⁵ CBS. (2020). Retrieved from Economic Survey, MoF, 2020/21a.

	Food Poverty	24%	16%	21% food insecurity 7.8% severe food insecurity	(NPC and WFP, 2019)
Food and Nutrition Security	Nutrition	41.5% stunting; 31.1% underweight; 13.7% wasting; 18% women with low Body Mass Index (BMI)	29% stunting; 20% underweight; 5% wasting; 15% women with low BMI	31.5% ⁶ and 36% Stunting (Global Hunger Index (GHI), 2020) 9% Wasting (GHI, 2020) 24.3% underweight 6.5% Severe underweight, 16% women with low BMI	(NMICS, 2020; and Von Grebmer et al., 2020)

Note: The indicators and some of the baseline data projections in the table has been retrieved from ADB technical consultant's report, 2013, and referred to assess the ADS review 2015/16 to 2020/21.

⁶ https://www.unicef.org/nepal/media/9076/file/NMICS_2019_-_Key_findings.pdf

ANALYSIS OF THE AGRICULTURE SECTOR

In the following part of the research report, efforts are made to look into the current situation of agriculture and its production.

1.1 Productivity Achievements of Major Agriculture Commodities

Nepal's economy predominantly relies on agriculture. Sixty-four percent of the labor force is engaged in agriculture (ILO, 2021), which will comprise 27.6 percent of the GDP in 2021 (MoF, 2019/20a). Rice, wheat, maize, and barely are the major cereal crop producers. The agricultural land area of Nepal increased from 37,020 sq. km in 1971 to 41,210 sq. km in 2020⁷, growing at an average annual rate of 0.22, making up 28.7 percent of the total land (The World Bank, 2020a).

The production and productivity data provided by MoALD show that the productivity of major cereal crops such as rice, wheat, and maize is increasing. Among the major food crops, the productivity of paddy is comparatively high, followed by maize and wheat. In 2020/21, the productivity of paddy stood at 3.82 MT per hectare, maize at 3.1 MT per hectare, and wheat at 3 MT per hectare, which shows a gradual increase in productivity over the years (MoALD, 2020/21). However, for other crops like millet, buckwheat, and barley, the productivity has either remained stagnant or diminished over the same period. This is likely due to a combination of factors such as inadequate winter rainfall, limited seed availability, a lack of research and development in seed breeding, limited access to year-round inputs such as fertilizer, labor shortages in rural areas, and changes in food preferences caused by changes in external sources of income or remittances.

Table 4. Productivity trend of major cereal crops in Nepal FY 2015/16 to FY 2021/22 (MT/ha)

Fiscal Year	Rice	Wheat	Maize	Millet
2015/16	3.36	2.59	2.43	1.15
2016/17	3.15	2.33	2.5	1.13
2017/18	3.37	2.55	2.55	1.16
2018/19	3.51	2.76	2.68	1.19
2019/20	3.76	2.85	2.84	1.19
2020/21	3.80	3.09	2.96	1.22
2021/22	3.82	2.99	3.06	1.23

Source: (MoALD, 2015/16 to 2021/22).

Although there is an increase in production, it can hardly meet the country's demand. There is a strident increase in the trade deficit in cereal imports as the country is importing a large quantity of cereals, vegetables, fruits, and other meat and dairy products. According to MoALD experts and specialists, the increased import of cereals is due to the demand for cereals for industrial purposes and the change in food habits of people with improved economic status supported by remittances. There

⁷ <https://tradingeconomics.com/nepal/agricultural-land-sq-km-wb-data.html>

is a high demand for fine rice, but the country production failed to meet the demand. The findings from Pokhrel (2020) shows Nepal is inclined towards the food self-sufficiency, for example, in case of tea (100%), coffee (100%), eggs (100%), cereals (97.4%), and potato (88.8%). Whereas, it is still deficit in case of milk (79%), vegetables (65.9%), meat (61%), pulses (26.6%), oil seeds (16.5%), and fruits. Similarly, in the time-series analysis of cereals yields, it shows that the food grains self-sufficiency ratio slightly declined to 87%, indicating still 13% of food grains needs import (Devendra et al., 2022).

Table 5. The trend of Rice Import in Nepal in ‘000 MT and NPR ‘000

Description	2015/16		2016/17		2017/18		2018/19		2019/20		2020/21		2021/22	
	KG	NP R	KG	NP R	KG	NP R	KG	NP R	KG	NP R	KG	NP R	KG	NP R
Various paddy including seeds of paddy rice (Total paddy)	94,364	2,494,769	163,302	4,286,779	215,051	5,972,528	235,168	6,846,050	348,336	10,479,713	698,062	20,549,996	551,749	16,990,727
Husked (brown rice)	9,287	417,983	288	13,478	351	25,649	463	38,590	5	239	48	3,522	6	676
Semi milled or wholly milled rice (whether or not polished or glazed)	391,304	18,758,447	393,823	18,758,522	498,198	22,799,159	488,982	24,249,176	410,919	22,237,520	546,876,996	27,620,576	528,375	29,045,786
Broken rice	44,653	1,131,868	32,685	81,980	29,791	73,499	44,955	1,118,644	29,232	93,395	89,344	2,612,854	50,396	1,536,496
Grand total	539,608	22,803,067	590,098	23,878,584	743,390	29,532,333	769,568	32,595,051	788,492	33,651,429	547,664,450	50,786,947	51,466,027	47,573,684

Source: (MoF, 2015/16c to MoF, 2021/22c).

According to the Department of Customs (DoC), Nepal imported food grains equivalent to NPR 74.28 billion in the fiscal year 2020/21. Of this value, the import value for rice and maize was NPR 47.57 billion and NPR 19.65 billion, respectively.

Table 6. Share of Total Agri-food Import Value of Top 5 Major Commodities

S. No.	Agri-food Commodities	Shares of total Agri-food import value for 2015-2019 (in %)
1	Cereals	27.12
2	Vegetables and certain roots and tubers; edible	10.71
3	Animal or vegetable fats and oils and their cleavage products; prepared animal fats; animal or vegetable waxes	9.12
4	Fruit and nuts, edible; peel of citrus fruit or melons	8.22
5	Food industries, residues, and wastes thereof; prepared animal fodder	8.04

Source: (BACI dataset, 2015 to 2020).

This trend shows the percentage share of each of the top 5 agri-food import commodities in relation to the total value of agri-food imports from 2015 to 2019. The average annual import value of agri-food for FY 2015–2019 is USD 1.23 billion. The data shows that cereals accounted for the largest share of total agri-food imports, at 27.12%, followed by vegetables and certain roots and tubers, which accounted for the second-largest share, at 10.71%. This trend indicates that cereals were the most significant commodities in the total value of agri-food imports during the 2015–2019 period, followed by vegetables and certain roots and tubers.

1.2 Current Status of Agricultural Inputs (Seed, Irrigation, and Fertilizer)

Location-specific seed availability, accessibility and availability of fertilizer, and sufficient year-round irrigation are the necessities to improve agriculture production in Nepal. In this section, efforts are made to identify the current status of agricultural inputs.

1.2.1 Seed Sector

The National Seed Vision (2013–2025) aims to improve food security by increasing the domestic production of high-quality, affordable seeds and making them available to farmers.

Looking at the trend from 2015/16 to 2017/18, the seed replacement rate increased from 15 to 22 percent for cereals. In recent days, some positive changes have been observed. The figure below shows the trend of seed production for major crops from 2015/16 to 2020/21. In the later years, there was some progress, which can be credited to the seed sufficiency program with its nationwide motto “seed guarantee for food security,” which has allocated about \$5.3 million for the implementation of seed policies through investment in resources and capacity building (The Kathmandu Post, 2022a).

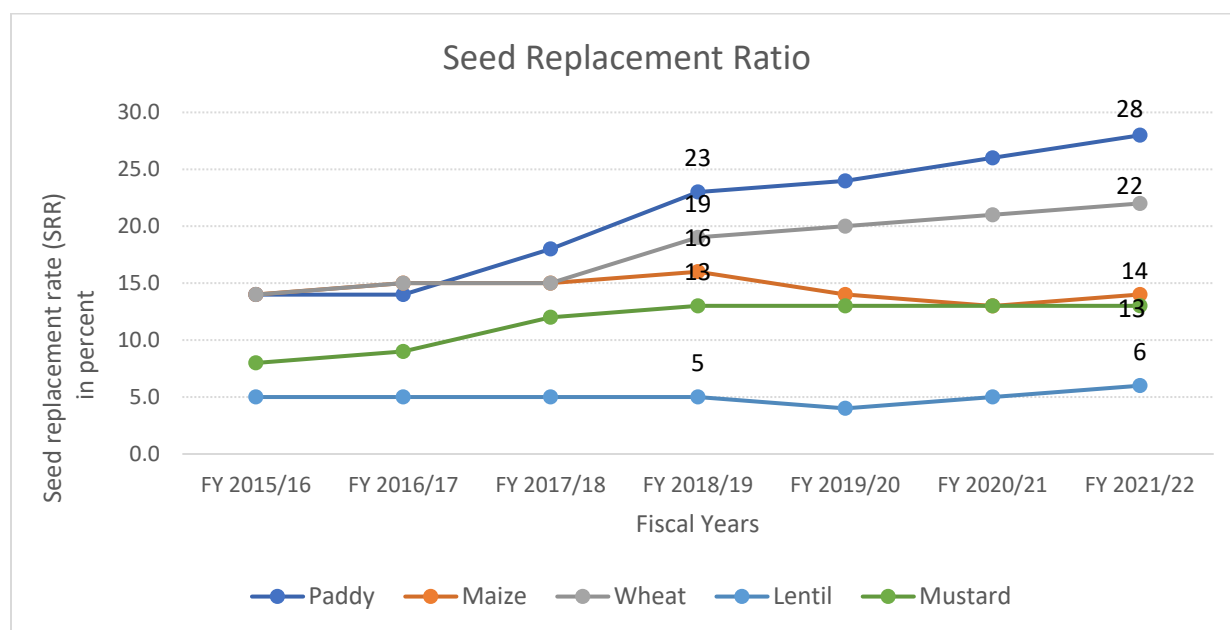
However, analyzing the supply-demand status, demand far exceeds supply. For example, the total demand for cereal seed in 2020/21 is approximately 180 thousand metric tons, but the total supply can only meet the demand for 40 thousand metric tons (MoALD, 2020/21).

The formal seed supply system, which produces and sells released and registered crop varieties, only provides about 17% of the country’s crop seed (Choudhary et al., 2020). This formal system is

relatively new and is dominated by small-scale enterprises that emerged from government and donor seed sector development programs. Farmer cooperatives are important seed producers and cater to farmers where seed companies are absent. The government also produces significant amounts of seed through community-based seed producers and cooperatives for distribution to farmers under the government’s seed subsidy scheme.

But still, the country is facing a seed shortage. Farmers are compelled to buy imported seeds from foreign countries, which most of the time do not produce grains as expected. This is the time for the country to change its production strategy as per demand. There is a high demand for hybrid seed for fine rice, which could be the means to double productivity; however, factors like the lack of research and resources and certain policies of governments are holding it back. The country needs to act aggressively on the research and development of required seed varieties as per the topography and climatic conditions of Nepal and make them accessible to farmers.

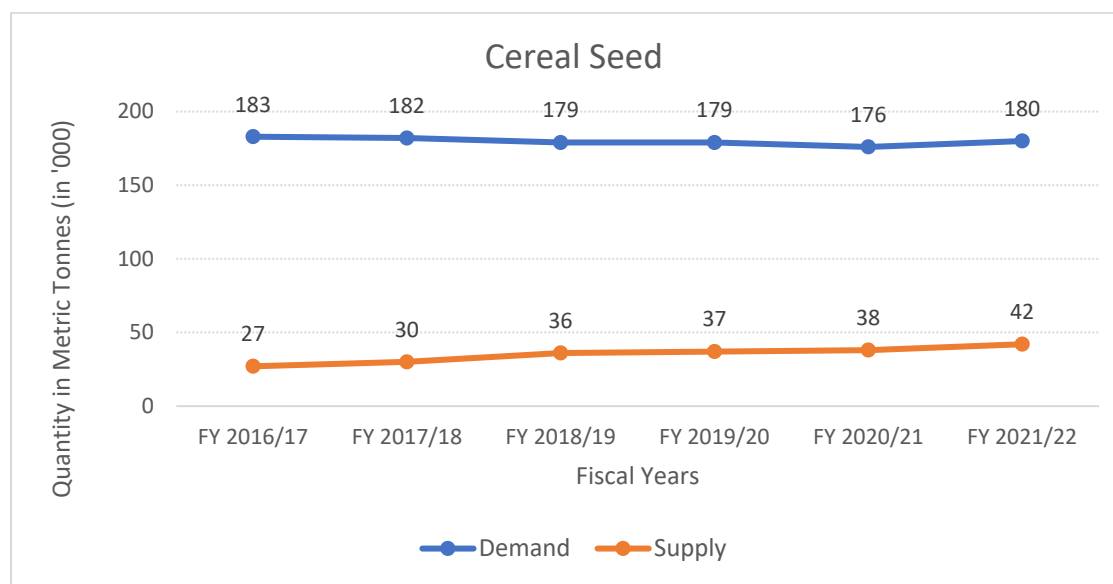
Figure 2. Seed Replacement Ratio (SRR)



Source: (MoALD, 2020/21)⁸.

⁸ MoALD, 2020/21. Retrieved from Seed Quality Control Centre (SQCC).

Figure 3. Demand and Supply Status of Cereals Seed



Source: (MoALD, 2020/21)⁹.

1.2.2 Fertilizer Sector

The level of chemical fertilizer usage in Nepal used to be one of the lowest (19.1 kg/ha) in the region in 2007 (Pullabhotla et al., 2011), which reached 74 kg in 2015 and 102 kg per hectare in 2020 (The World Bank, 2020b). There is a continuous increase in the use of chemical fertilizers and in their demand as well. Despite an increase in total sales, the agriculture sector in Nepal continues to have constraints in accessing them because the demand far exceeds the supply. As per the statistics of MoALD, the annual demand for chemical fertilizers is more than 700,000 metric tons (KIIs with GoN Stakeholders; Adhikari, Gauchan and Singh, 2023); however, the country employs just 379,152 metric tons (MoALD, 2020/21).

The supply of chemical fertilizer in Nepal is completely dependent on imports, as there is no domestic production facility. As per the current policy, only two government entities, namely, AICL and Salt Trading Corporation Limited (STCL), are the authorized importers of the chemical fertilizers to be distributed to the farmers on price subsidies. As per the 2020/21 directives for the distribution of subsidized fertilizer, the quota is allocated to each local level. The concerned local level delegates the distribution of subsidized fertilizers to one agriculture cooperative from one Ward.

⁹ (MoALD, 2020/21). Retrieved from Seed Quality Control Centre (SQCC).

Table 7. Annual Sale (NPR) of Chemical Fertilizers in 2015/16 to 2020/21

Fertilizers	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Urea	213,063	205,425	235,304	215,733	224,700	225,180	143,482
DAP	107,121	114,802	105,619	120,893	160,298	140,982	77,720
Potash	7,336	7,991	7,811	7,377	9,597	12,990	6,633
Total AICL & STCL	327,520	328,217	348,734	344,004	394,595	379,152	227,836

Source: (MoALD, 2015/16 to MoALD, 2020/21).

The government of Nepal, for the first time, took the unprecedented step of importing chemical fertilizer from Bangladesh under a government-to-government (G2G) model, and imported a total of 50,000 MT of chemical fertilizer (MoFA, 2021). As per the G2G agreement with India in March 2022, Nepal is set to import a significant quantity of urea and DAP chemical fertilizers on an annual basis, this amount falls within the range of 150,000 to 210,000 metric tons every year. Additionally, over the course of the next five years, MoALD and AICL are expected to import a total of 935,000 metric tons of chemical fertilizers (urea and DAP) from India (Myrepublica, 2022).

In September 2022, the NSAF project and the Fertilizer Association of Nepal (FAN) held a policy dialogue in Kathmandu to identify the issues facing the supply of fertilizers in Nepal and to offer potential solutions. During the policy dialogue, several options were proposed to enhance the efficiency of the fertilizer supply system in Nepal. These included decreasing the current fertilizer subsidy by 20–30% and using the saved funds to increase imports and allocate subsidies based on demand, creating a procurement timeline to guarantee a timely supply of fertilizers for major crops, importing about 30% of fertilizers through G2G agreements, implementing a crisis management strategy by maintaining buffer stocks at a level of 20% of the total demand, and ensuring a fair environment for the private sector in the import and distribution of fertilizers.

In fiscal year 2021/22, the government had set aside NPR 12 billion for chemical fertilizer, with an additional 3 billion (in total 15 billion), in the face of COVID-19 impacts on international price hikes (MoF, 2021/22b; and The Kathmandu Post, 2021). There has been a massive increase in the international price of fertilizers in recent years, mainly due to the COVID-19 pandemic and the Russia-Ukraine crisis. The demand for chemical fertilizers, their prices, and government subsidies have been increasing every passing year. From KIIs with STCL, the urea, DAP, and MoP imports in FY 2020/21 were 1,221, 1,307.4, and 1,250 USD/MT, respectively (Adhikari, Gauchan and Singh 2023). This is nearly three times higher than the import price in FY 2019/20. The budget limitations and the international price hikes have led to significant fertilizer shortages in the country. Every year, there are issues with the short supply and timeliness of fertilizer supplies. The government is also mulling over adjusting the subsidized price.

The government of Nepal has been promoting organic agriculture for over two decades. So far, a number of policies and programs have been implemented. Promoting the production and use of organic fertilizer is one such initiative. Since FY 2010/11, the government has been providing a 50%

capital subsidy in machinery required to set up organic fertilizer factories (MoF, 2011/12). Twenty-three plants were established utilizing the government subsidy, but only around 15 of them are reported to be in operation now. Basically, a massive influx of organic fertilizer plants, the unavailability of raw materials, and unhealthy competition are to blame for the closure of many such plants. Two years later, the government started to provide price subsidies for organic fertilizers for the first time as per the 2011 organic fertilizer subsidy directives. Under the subsidy scheme, farmers were entitled to NPR 10 per kg of organic fertilizer, up to a maximum of 1,500 kg of organic fertilizer per farmer (Panta, 2020). A separate operational guideline was put in place to streamline the distribution of subsidized organic fertilizer at the district level. None of these programs exist today in their original form or spirit. These programs have seemingly ceased following the federalization and termination of the District Agriculture Development Office (DADO) and the district-level extension office. However, these and some other schemes for promoting organic fertilizer, together with the growing demand for organically produced foods, have resulted in the massive growth of organic fertilizer plants. Some local and provincial governments have programs and budgetary support to provide subsidies for the production and use of organic fertilizers. The government has recently issued a directive for the production of organic and biofertilizers. This directive is expected to facilitate the production, distribution, and use of quality organic and biofertilizer.

1.2.3 Irrigation

Nepal has a cultivated area of 2,642,000 ha (18 percent of its land area), of which two-thirds (1,766,000 ha) is potentially irrigable. At present, 42 percent of the cultivated area has irrigation of some sort, but only 17 percent of the cultivated area has year-round irrigation. An estimate shows that less than 8 percent of the country's water potential is used for irrigation (Poudel, 2019). In 2020/21, an additional 15,508 ha were added to expand the irrigated land, among which 10,843 ha were surface and 4,665 ha of underground irrigation facilities (MoF, 2020/21a). Overall, the irrigated land increased from 583,000 ha in 1990 to 1.419 million ha in 2019 to 1.503 million ha in 2020, which shows progress in this sector (MoEWRI, 2019; and MoF, 2020/21a), but is still far from achieving the target set by ADS in 2016. However, the government is making continuous efforts to develop irrigation in Nepal. The table below shows the details of irrigation projects in Nepal.

Table 8. Details on Irrigation Projects in Nepal

Projects	Budget in NPR billion	Commencement	Planned Completion	Irrigation area in ha	Cost/ha in NPR million	Physical progress in %
<i>Mahakali Irrigation</i>	35	2006/07	2027/28	33,520	1.04	12%
<i>Sikta Irrigation</i>	25.02	2004/05	2028/29	42,766	0.58	71%
<i>Rani Jamara Kulariya</i>	27.7	2010/11	2023/24	38,300	0.72	52%
<i>Babai</i>	18.96	1988/89	2025/26	36,000	0.53	52.5%
<i>Bheri-Babai Diversion Multipurpose Project</i>	36.8	2011/12	2022/23	51,000	0.72	38%
<i>Sunkoshi Marin Diversion Multipurpose</i>	46	2019/20	2023/24	122,000	0.38	3.5%
Total	181.46			323,886	0.56	

Note: (MoEWRI, 2019; The Auditor General's 58th Annual Report, 2021; and The Auditor General's 59th Annual Report 2022).

The Government of Nepal has also started a subsidized solar irrigation program through the Alternative Energy Promotion Center (AEPCC). The government provides a 60 percent subsidy to install solar-powered pumps. In 2021, more than 2,000 farmers have received a subsidized solar pump (IWMI, 2022). MoALD is also providing support for farmer-managed irrigation and subsidies for electricity for irrigation. Different schemes are in place in different provinces and states to facilitate irrigation for agriculture.

1.2.4 Farm Mechanization and Technological Changes

The geography, fragmented land, and small and terraced plots pose challenges for farm mechanization in Nepal, which is another contributor to lower yields in cereals and crops. The fragmentation of land by the majority of smallholder farmers also poses challenges; 62.6 percent of farmers hold land less than 0.5 ha, of which 10.6 percent hold land less than 0.1 ha (National Agriculture Census, 2021).

Since 2011, 30,000 mini-tillers have been distributed in Nepal, targeting small-scale farmers with less than 0.4 ha (CSISA, 2021). Before the ADS inception period, the survey findings and literature show Terai Zone was quite active in the adoption of tractors and farm mechanization tillage. Takeshima (2017) via the Nepal Living Standards Survey (NLSS) reported that less than 8% of the farms used mechanized tillage (basically tractor) in the hills and mountains, while 46% of the farms used mechanized tillage in the Terai zone. The Agricultural Mechanization Promotion Policy was just promulgated during the ADS inception period of 2015 (Takeshima, 2017). Youth migration has

compelled the utilization of farm mechanization, which is resulting in an increase in adaptation to farm machinery.

The ADS has proposed two agri-mechanization centers in the Terai, one in the mid hills and one in the high hills. In response to this, the project “Sustainable Agricultural Mechanization,” implemented by the Center for Agricultural Infrastructure Development and Mechanization Promotion (CAIDMP), DoA, and MoALD, involved the establishment of two Custom Hiring Centers (CHCs) in *Siraha* district (*Laban* municipality) and *Udaypur* district (*Belaka* municipality), which are managed by committees primarily composed of women, making up over 75% of the committee. These CHCs provide mechanization services, such as the use of machinery and equipment for enhancing the productivity of crops such as rice, maize, wheat, and vegetables (Food and Agriculture Organization, 2022).

Through access to these mechanization services, the CHCs have been able to benefit over 250 members in the two districts. It has helped to reduce the labor intensity of farming, improve farm management, and save time and money. The CHCs are equipped with a wide range of machinery and tools, including two-wheel tractors and trailers, mini-tillers, planters, transplanters, weeders, reapers, mobile threshers, dehuskers with corn shellers, combined dehuskers and mills, and solar dryers (FAO, 2021).

Another effort was made through the PM-AMP, 2016-2025, which is one of the largest active projects under the MoALD in Nepal. This project aims to promote self-sufficiency in agriculture by boosting productivity and generating employment opportunities through agri mechanization and agri-business promotion. The project has established several infrastructures, including 583 custom hiring centers, 205 high-tech semi-high-tech nurseries, and greenhouses, 369 post-harvest centers, 18 agricultural industries and laboratories, irrigation facility for 4,236 hectares of land along with 952 additional irrigation schemes, solar facility for 62 places, fish ponds for 2,249 hectares, consolidated lands for 1,350 hectares, etc. (MoF, 2020/21a).

The National Agriculture Census (2021) shows the number of farmers using tractors for the agricultural operation nearly doubled from 8 lakh forty-five thousand (22%) in 2011 to 16 lakhs thirty-nine thousand (40%) in 2021. Also, the findings shows that the number of tractors increased from 37 thousand to 58 thousand during the interval of 10 years. The number of farmers using power tiller was found to be 4 lakh 11 thousand attributing only 11% of the farmers in 2021 while only 76 thousand (2%) of the farmers were using power tiller for agricultural purpose in 2011. Furthermore, only 8 lakh 3 thousand farmers used thresher in 2011 while it increased to 11 lakh 75 thousand farmers in 2021.

1.3 Food and Nutritional Security

Poverty alleviation, food, and nutritional security are crucial components embedded in agricultural achievements. Efforts by the government and other development agencies to address food poverty have made some progress, but they have not been able to contribute to reducing poverty and food scarcity in rural areas as anticipated by the government. The new report “Nepal Multidimensional Poverty Index: Analysis Towards Action (2021)” shows that Nepal succeeded in lifting 3.1 million people out of multidimensional poverty between 2014 and 2019, but still, 4.9 million people are multi-

dimensionally poor, which is 17.4% of Nepal’s population. Disaggregated data show that there are still 39.5 percent of people who are multidimensionally poor in *Karnali* province, followed by *Sudurpashchim* province 25.3 percent (National Planning Commission, 2021).

Table 9. Multidimensional Poverty Index of Nepal

Provinces	Poverty Index (%)
<i>Koshi</i>	15.9
<i>Madhesh Province</i>	24.2
<i>Bagmati</i>	7.0
<i>Gandaki</i>	9.6
<i>Lumbini</i>	18.2
<i>Karnali</i>	39.5
<i>Sudurpashchim</i>	25.3
National	17.4

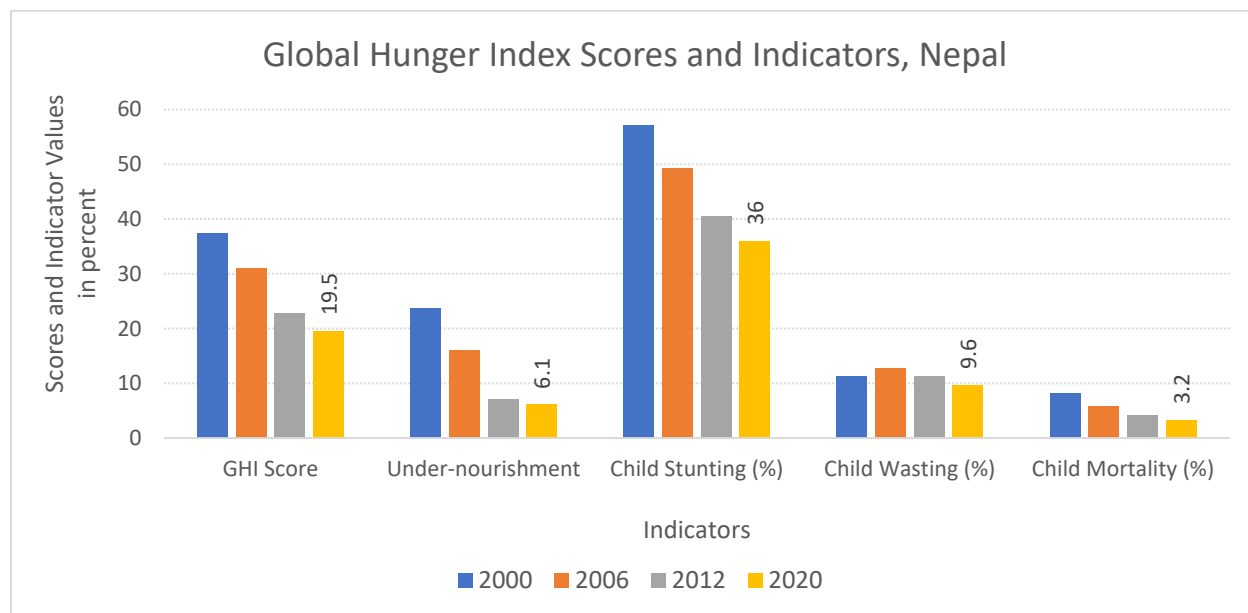
Source: (National Planning Commission, 2021)¹⁰.

Nepal is classified as a localized food insecure country, ranking 74th on the Global Food Security Index (GFSI) (Economic Impact, 2022). The GHI has fallen almost by half from 38 in 2000 to 19.5 in 2020, but it is still considered moderate, which is a concern for food insecurity in Nepal.

Undernourishment fell from 23 to 6 percent, child stunting from 57 to 36 percent (still high), child wasting modestly from 11 to 9 percent, and child mortality from 8 to 3 percent within the period of two decades (2000-2020). According to the five-year target of ADS, child stunting should have fallen to 29 percent and child wasting to 5 percent by now, but the values are still unacceptably high. The child stunting is particularly a concern in *Karnali* province (55 percent), which is almost twice as high as in *Gandaki* province. This can be linked to poor access to dietary nutrients and a lack of variety in nutrient-dense foods, resulting in micronutrient deficiencies in food crops (MoH, New Era and ICF, 2017).

¹⁰ (Nepal Multiple Indicator Cluster Survey, 2019).

Figure 4. Global Hunger Index Scores and Indicators



Source: (MoH, New Era, and ICF, 2017 and Von Grebmer et al., 2020).

To address the issues of food poverty with the investment of 1 billion NPR by the ministry of finance, the government has established “food banks” with an aim to establish 200 food storage centers to tame food insecurity in Nepal (MoF, 2020/21a).

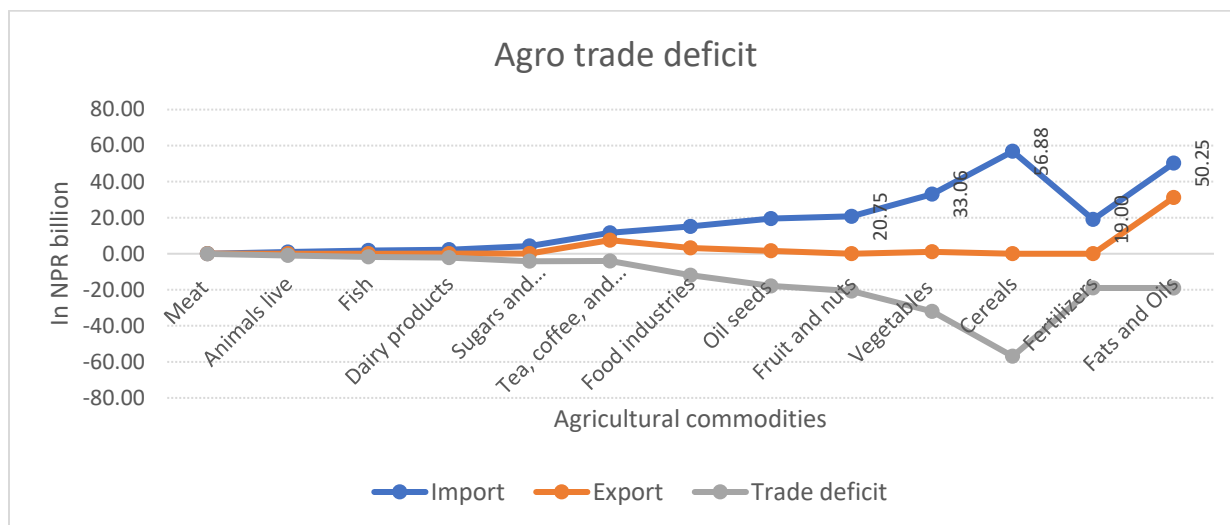
1.4 Agribusiness, Marketing, Value Chain and Trade

Agriculture in Nepal is transitioning from subsistence to commercial, but at a slow pace (MoF, 2020/21a). In 2018/19, 31.1% of the total exports and 14.6% of the total imports were agricultural commodities (MoF, 2018/19a). In 2020/21, the share of agricultural imports increased and reached 21% of the total imports (MoF, 2020/21a).

The top imports among agricultural commodities include cereals (NPR 56.88 billion), fats and oils (NPR 50.25 billion), vegetables (NPR 33.06 billion), fruits and nuts (NPR 20.75 billion), fertilizers (NPR 19 billion), along with numerous other goods. Among the total agriculture imports, cereals have the highest share and constitute more than 50 percent of the total imported food crops. Nepal mainly exports fats and oil (NPR 31.20 billion) and tea, coffee, and spices (NPR 7.52 billion); however, the trade deficit is noticeably significant in all agricultural commodities in 2020/21.

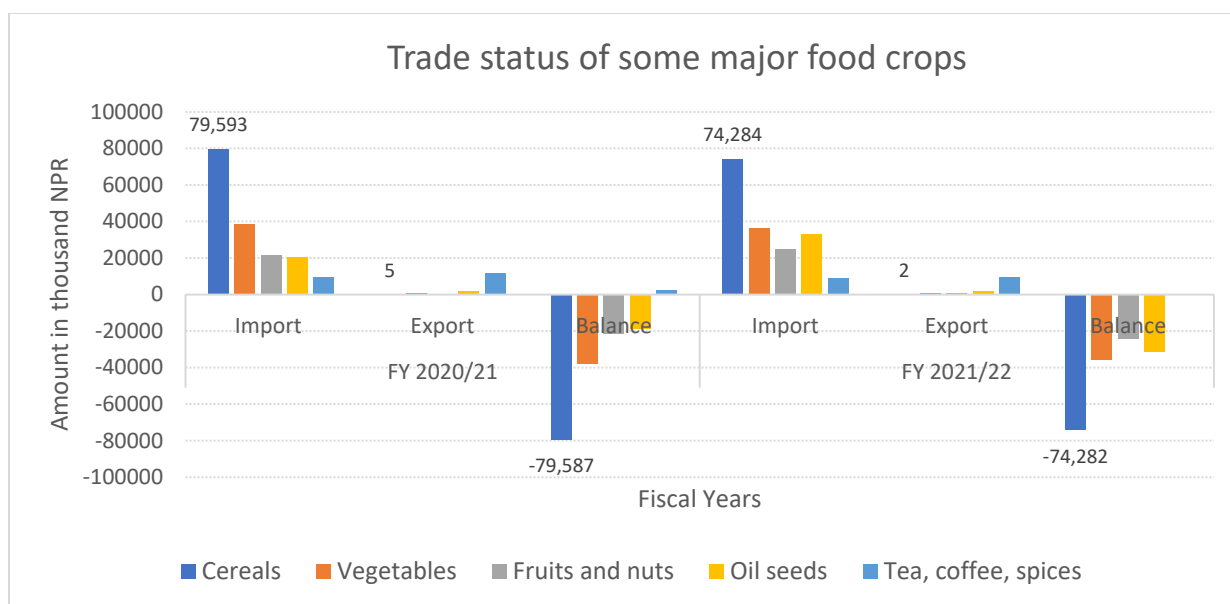
The following graphs show the current trade status of the country.

Figure 5. Agro-trade deficit in Nepal



Source: (MoF, 2020/21c).

Figure 6. Trade status of some major food crops



Source: (MoF, 2020/21c; and MoF, 2021/22c).

1.5 Agricultural Finance

Access to financial services is key to building farmers’ resilience. In 2017, NRB launched the Priority Sector Lending Programme (PSLP), under which banks and financial institutions allocate 10% of their loan portfolios to the agricultural sector. This share will increase to 12 percent in 2022. Commercial banks, development banks, and finance companies are engaged in this scheme (The Kathmandu Post, 2022b). As per the guidelines, loans shall be made available, at a 5% interest subsidy on the base rates

of these institutions, of up to NPR 50 million (USD 454,000) for businesses and NPR 15 million (USD 136,000) for individuals for producing, processing, and marketing agriculture and livestock commodities (Choudhary et al., 2020). The following table shows the agriculture finance trend and current status.

Table 10. The trend of bank credit/loans in agriculture

Details	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Number of credit transaction institutions	355	405	446	476	490	596	645
Number of farmers taking credit	68,816	83,242	102,746	125,087	145,036	174,349	193,786
Loan approved (in million NPR)	10,559.2	13,199.0	15,923.1	18,603.2	20,691.5	24,123.7	18,225.7
Loan investment (in million NPR)	9,797.9	11,975.0	15,005.1	17,724.9	17,242.9	20,601.6	15,642.0

Source: (MoF, 2020/21a; and MoF, 2021/22a).

However, due to banking fees, distance from banks, low literacy levels, and cultural barriers that make farmers hesitant to approach formal banks, farmers still do not have access to this finance in practice; only 45% of Nepalese use formal banks. Most of the rural population either stores cash at home or takes credit from the informal sector, where interest rates can soar as high as 48% (Winrock International, 2021). The table below shows the trend of the percentage share of loans in agriculture sectors.

Table 11. Share of total loans in agriculture sectors, in NPR million

Categories	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
	Jul	Jul	Jul	Jul	Jul	Jul	Jul (R)	Jul (P)
Agriculture	156,935	191,395	215,688	261,874	323,636	375,477	510,349	594,935
Total Credit	1,362,087	1,681,853	1,986,225	2,422,779	2,911,897	3,266,012	4,172,785	4,709,130
Share of credit inflows of the agriculture sector to the total credit	11.52%	11.38%	10.86%	10.81%	11.11%	11.50%	12.23%	12.63%

Source: Nepal Rastra Bank (2015/16 to 2022/23).

Note: R=Revised, P=Provisioned.

Agriculture sector is highly a risk prone sector, and the agricultural insurance is the key option to manage farm level risk induced by climate and other disaster (Warner et al., 2013). The government of Nepal has been implementing crop and livestock insurance since January 2013 by formulating crop and livestock insurance directives. The insurance scheme provided by various companies is quite effective, with 75 percent of the premium being provided by the government (MoAD, 2013)¹¹. The current agricultural insurance schemes under the various categories of ‘sum insured, premium, subsidized premium, claimed paid are provided by the government to provide coverage of crops and livestock sectors along with fisheries, and birds (MoALD, 2020/21). The poor and marginal farmers continue to be deprived of the subsidies, often referred to as “hijacked subsidies” between the government and affluent farmers (Timilsina, 2019). At present, there are 20 insurance companies providing insurance in the agriculture sector in various regions of the country (Devkota et al., 2021). The federal government in 2018—at all levels—gave a boost to all kinds of subsidies by allocating around NPR 18 billion annually. However, the use of this assistance has not been fruitful because less attention has been paid to the crop sector (Kaini, 2020).

1.6 Budget vs. Expenses vs. Programs

The agriculture sector has always been less prioritized when allocating the budget with reference to its contribution to GDP. The government has introduced the National Campaign Year for the Agricultural Production for Self-Reliance in the current fiscal year (MoF, 2022/23), with an increased budget allocation of 33 percent to NPR 60 billion, equivalent to 3.3 percent of the total budget. Yet, the budget is still insufficient to cater to the rising needs of farmers and effectively implement modernization and commercialization in agriculture. Fiscal delivery has been poor, with only 62% of the budget delivered in the last five years.

The budget includes NPR 15 billion for the import of fertilizers, which is insufficient to meet even one-third of the country’s total requirement. Additionally, NPR 33.5 billion has been allocated for water resources and irrigation projects, despite many of these projects facing time and cost overruns and negatively impacting agricultural productivity. The government aims to irrigate 21,600 hectares of additional land and establish an NPR 500 billion microfinance fund for agriculture credit to small farmers. The goal is to reduce imports of key products such as paddy, maize, wheat, vegetables, and fruits by 30 percent in the coming year, though it is unlikely that imports can be reduced by one third within a year. This highlights a disconnection between resource allocation and targets and raises concerns about the credibility of the fiscal policy.

¹¹ (MoAD, 2013). *Crop and Livestock Insurance Directives 2013*. Retrieved from: https://doad.bagamati.gov.np/sites/default/files/final%20report_Crop%20insurance_NAES_2078_TBhandari_0.pdf

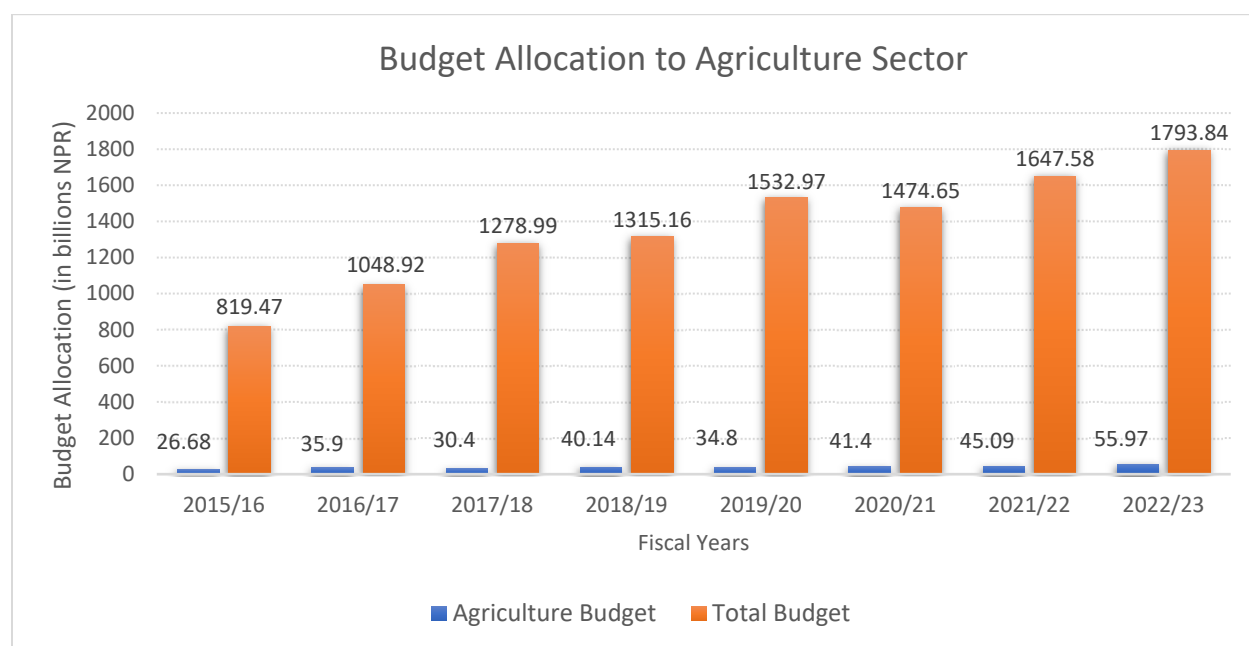
Table 12. Share of agriculture budget (in billion NPR) to the total budget and its share of the expense

Fiscal Years	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Share of agriculture budget to the total budget (percent)	26.68 (3.3)	35.9 (3.4)	30.4 (2.4)	40.14 (3)	34.8 (2.3)	41.4 (2.8)	45.09 (2.7)	55.9 (3.1)
Share of agriculture expense to agriculture budget (percent)	22.09 (83)	34.75 (96.8)	23.97 (78.9)	19.66 (49)	21.09 (60.6)	23.01 (55.6)	-	-

Source: (MoF, 2015/16b to MoF, 2022/23).

Note: Figure in parenthesis includes percent.

Figure 7. Budget allocation to agriculture sector



Source: (MoF, 2015/16b to MoF, 2022/23).

1.7 Cross-Cutting Themes (Climate Change and Social Inclusion)

Nepal is extremely vulnerable to climate change, and this has radically changed seasonal water availability, causing droughts during the dry season and increased flooding during the monsoon

season. Looking at the trend from 1975 to 2005, the mean temperature has risen by about 0.6°C in a decade, and from 2016-2045, it is expected to increase the global temperature by about 0.9–1.1°C (MoFE, 2019). This gradual change in mean temperature can have an influence on rainfall patterns and CO₂ levels, thus impacting total crop yields (Malla, 2008). A recurring trend of late monsoon has been observed in recent years, with subsequent impact on summer crops. Research conducted by the Nepal Country Vulnerability Study Team in 2009 has projected that Nepal’s mean annual temperature may rise by 1.4 degrees Celsius by 2030, 2.8 degrees Celsius by 2060, and 4.7 degrees Celsius by 2090 (NCVST, 2009). Nepal contributes only 0.027% of total greenhouse gas emissions globally, but due to rising atmospheric temperatures and its fragile geology and geographic location, Nepal is disproportionately affected by climate change. Extremely high precipitation, an increase in temperature, extremely low precipitation or drought, and increased climatic variability are major climate change event risks faced by all regions in Nepal.

Evidence suggests that the observed changes in temperatures and soil moisture are negatively affecting agriculture in many parts of Nepal. The Terai region, Nepal’s prime agricultural belt along the entire southern region of the country, is most at risk from flooding. This could lead to inundation or the depositing of sediments on agricultural land. Similarly, drought—both during winter and summer—is affecting crop production. In recent years, there has been a recurring trend of late monsoon, which has had an impact on summer crops. As there is a dominance of small and marginal farmers in the country, such groups are more vulnerable to climate shocks. The ability of Nepal’s agriculture sector to adapt to these changes is limited.

The national climate change policy of 2019 replaces the erstwhile National Climate Change Policy of 2010. It incorporates changes and amendments to certain provisions as a result of changes in international obligations and national scenarios, including the federal context. Agriculture- and food security-related policies, strategies, and working policies are proposed for dealing with climate change issues. Likewise, the Second Nationally Determined Contribution (NDC, 2020) proposes a mitigation and a National Adaptation Plan (NAP) framework and actions. The major provision of the second NDC pertinent to agriculture basically involves reducing emissions from agriculture, promoting climate-smart agriculture technology, and implementing climate-smart villages.

Although some provincial governments have implemented climate smart villages and other climate change adaptation-related programs, such programs barely meet the technical standards and quality requirements.

Currently, all three tiers of government units generally lack the capacity to implement the international conventions and treaties that Nepal has signed.

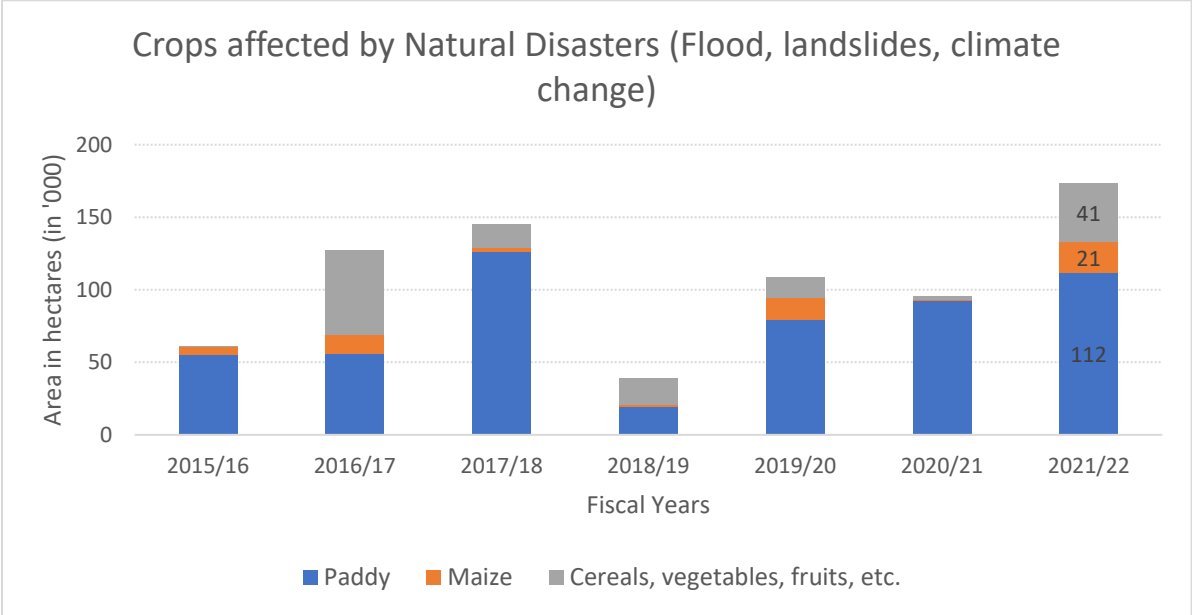
Despite the recognition of climate change adaptation in agriculture by various frameworks, the role of MoALD in formulating policies and designing programs and projects for adaptation needs to be strengthened. The Ministry of Forest and Environment (MoFE), being the focal ministry for climate change-related affairs, needs to play a more proactive role in involving MoALD in dealing with climate change issues in the agricultural sector.

In the recently concluded CoP 27, Nepal presented a report on the impacts it is facing in the face of a changing climate. In past CoPs, Nepal has largely failed to capitalize on a global platform such as the CoP by garnering international attention and support as one of the most vulnerable countries to climate change. Access to climate finance is touted as a big success for LDCs like Nepal, but the modality for such support has yet to be finalized. Back home, the representation of MoALD in CoP 27 and the intermenstrual communication and coordination between MoFE and MoALD in implementing the commitments made by Nepal in CoP 27 have been poor. One of Nepal’s NDC commitments is to maintain a forest cover of 45% of the total area of the country by 2030, with a maximum of 4% other wooded land (Government of Nepal, 2020). As of now, the country has a forest cover of 45.31%, including 3.62% of other wooded land (The Rising Nepal, 2022).

In a similar vein, natural disasters, climate change, weather-induced risks, and irregular rain patterns, including floods, landslides, and drought, have continued to cause a tremendous loss in crops, vegetables, and fruits. These effects are particularly prominent in paddy, which has incurred a loss of about 20,000 to 130,000 hectares of land over the past few years.

According to the National Agriculture Census, 2021, a 1807 thousand farmers were aware about the concept of climate change, among which 1639 thousand farmers (91%) reported that the impact of climate change was evident in their agricultural operation. Among those farmers cognizant of impacts of climate change in agriculture, 1387 thousand (85%) reported that the agriculture performance is affected by climate change.

Figure 8. Crops affected by natural disasters



Source: (MoF, 2015/16a to MoF, 2021/22a).

In the social dimension, there are also considerable gender differences in farm and off-farm activities in Nepal. In recent years, the outmigration of the young generation has added more workload for farmers (Adhikari and Hobley, 2015), especially for women and the older age group. Women play a

significant role in both crop and livestock production, in addition to off-farm and regular household responsibilities. Recent data revealed that in 2021, more than 1,700 Nepalese people will travel abroad daily for employment. According to the 2021 Census Data, there are 2.2 million Nepalis living abroad, 81.28% of whom are men and 18.72% of whom are women, who migrated out of the country in search of work (Rijal, 2022). Hence, this has increased feminization in agriculture. Thus, the task of managing land has now fallen to those left in rural areas, primarily women and the elderly. The ownership of land by women is only about 19.5 percent in Nepal (MoF, 2020/21a). The limited ownership of land has constrained women from obtaining incentives, loans, and subsidies for agricultural production from government and financial institutions (FAO, 2019).

Over the years, there have been remarkable achievements in gender and social inclusion in public agriculture development endeavors. Participation of women farmers, socially disadvantaged groups, and people from remote areas in agriculture extension and government support schemes has increased substantially. However, there has been a poor state of meaningful participation among such groups.

From the period 2004-2022 Nepal's agriculture sector has experienced significant policy developments. Newer policies are now promoting inclusivity in agriculture, targeting women, *Dalits*, marginalized groups, and youth. Current policies aim for 50 percent female representation, emphasize data disaggregation, and have introduced special programmes for agricultural enterprises owned by disadvantaged groups. In addition to improving access to seeds, bolstering food security, and ensuring biodiversity, mechanization has also been promoted to enhance farmers'/entrepreneurs' access to machineries for efficient and sustainable agriculture development. The Gender Responsive Budget Formulation Guidelines advocate to increase women's participation in planning and implementation of the MoALD and department's programs, and the beneficiary's level; capacity building of women officials and women beneficiaries; increasing women's access to the programs components (optimum 50% or more); monitoring through a disaggregate approach of the beneficiaries; increasing women's employment and income. Ensuring efficient time management and reducing the workloads of the women¹² (MoF, 2013). The implementation of Gender Responsive Budgeting (GRB) has been designed, coding in the three categories of direct responsive (code 1), indirect responsive (code 2), and gender-neutral categories (code 3) in coordination with NPC, MoF, and MoALD. The gender-balanced work force has been progressing at the federal level, and males are still dominating the workforce in the local bodies. The mandatory participation of women leaders in local bodies and 33% of women employees has a slow impact on the administration work force; 45% of reservations are for inclusive categories, and 33% are reserved explicitly for women in the civil service (Civil Service Act, 2014).

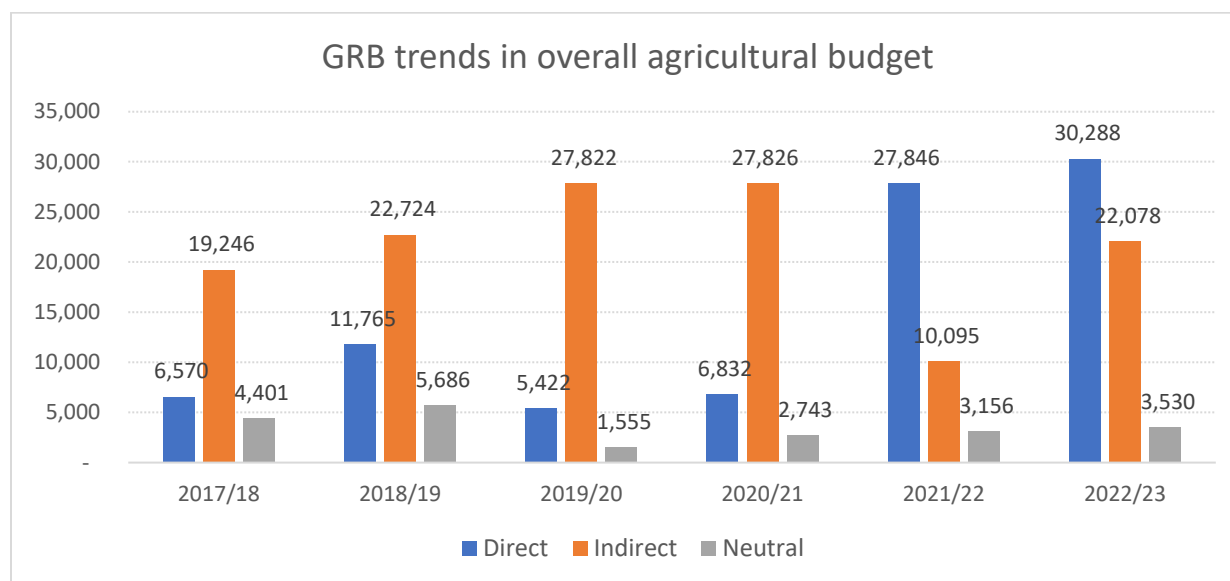
The share of direct budget allocation in the agriculture sector fluctuated between 2017/18 and 2019/20 before increasing in a trend that has continued until 2022-23, now at 54%. The neutral budget share has remained relatively low, now at 6 percent of the total. This indicates that the agriculture sector is highly sensitive to Gender-Responsive Budgeting (GRB), as there is a greater budget allocation in direct headings compared to national budget headings in these recent two fiscal years (Figure 9). The Ministry of Agriculture and Livestock Development (MoALD) has consistently

¹² MoF. 2013. (<https://old.mof.gov.np/grbc/GRB%20Guideline.pdf>).

allocated more GRB budgets than any other ministry in each fiscal year since the introduction of GRB, as mentioned by MoALD officials. One possible reason for this could be related to the growing trend of men’s outmigration and the increased participation of women farmers in agricultural activities.

Overall, the implementation of GRB has been in shadow because of a lack of GRB tracking and implementation mechanisms in the accounting system, a lack of disaggregate data on women and men beneficiaries, a lack of clarity in GRB project categorizations, and capacity-building in the ministries and local bodies. The budget speech and red book details indicates huge mismatch of the programs and coding. Therefore, considering the social dimension during the program design is very important. Currently, the proxy basis of estimation based on the male and female farmers participation in the programs is the only way to get clues of the budget and program design and dissemination. The handling of the technological aspects both on accounting software, disaggregate basis of tracking and reporting mechanism, timely budget release and overall proper coordination of the three-tiers government are the key for the effective implementation of the GRB. The GoN should also mandate these as national priorities along with the climate and Sustainable Development Goals (SDGs) due to similar nature of the coding, tracking and reporting scope.

Figure 9. GRB trend in overall agriculture budget



Source: Analysis from the Budget Speech, MoF (FY 2017/18 – FY 2022/23). Note: FY 2017/18 and FY 2018/19 includes both Ministry of Agriculture Development and Ministry of Livestock Development, combined values.

Several formative changes have been made to make agricultural programs and initiatives Gender Equality and Social Inclusion (GESI) friendly, but not many substantive changes have been made.

CONCLUSION AND RECOMMENDATION

Despite the critical role that agriculture plays in Nepal's development and the fact that more than 60% of the population relies on this sector for their livelihood, it has not received sufficient attention from policymakers. Since 2015, the contribution of agriculture to the GDP has decreased, from 29.4% to 24%, highlighting the need for increased investment and support. Nearly 63 percent farmer are small holders with less than 0.5 ha of land.

The country's agriculture system is still facing input shortages like seeds and fertilizers, limited access to extension services and credits, limited irrigation facilities, increasing production costs due to inflation of input materials, labor scarcity due to migration, and the impacts of climate change such as floods, unexpected rainfall, drought, an increase in pests and diseases, soil erosion in the hilly region, and the loss of soil organic matter, even though some sign of improvement.

The agricultural sector in Nepal has also been hindered by a variety of structural issues, including inadequate infrastructure and distribution systems, a lack of timely and sufficient access to chemical fertilizers, poor irrigation infrastructure, and a deficiency of improved seeds. Additionally, Nepal's agricultural sector has been impacted by a high level of subsidy in neighboring India, as well as the absence of quarantine facilities at key border points and a lengthy stretch of open border, which have facilitated the unrestricted imports of agricultural goods from India, regardless of quality or domestic production levels. As a result, Nepal has become heavily reliant on imports, even for basic agricultural products that it once produced itself.

The production trend of major agriculture commodities shows an increment; however, this does not necessarily mean that ADS strategies are adopted in line with government programs and plans, resulting in increased production and productivity. The constraints and problems remain the same as they were a decade ago. Some of the five-year targets set in the ADS look unrealistic; for example, the trade deficit is negative and the AGDP is only \$931.

In an effort to enhance Nepal's export potential, particularly in the agricultural sector, the government has identified a range of traditional products, including cardamom, ginger, tea, and coffee, as being particularly promising. However, despite this potential, a number of challenges currently stand in the way of maximizing export earnings from these products. These challenges include low factor productivity, a lack of cost competitiveness, and limited scalability.

The youth's out-migration is another irony currently distorting the adequate and cheap agricultural labor force requirement for the country. Nepal has led to a decline in subsistence farming and increased fallow land in rural areas in last decade due to demography changes in the rural areas. This has had negative consequences for agriculture, it has also contributed to the expansion of shrub and light forest coverage on abandoned land, resulting in an increase in forest cover to 45% of the surface area from a low of 39% in 1990. The remittances have altered the consumption patterns of the rural population, shifting them away from self-grown staples like millet, maize, and wheat towards market-bought rice.

Overall, ADS is a well-crafted vision and strategic framework to guide agriculture development in the country over the next 15-20 years. It has the capacity to transform the Nepalese agriculture sector. However, the implementation is at a primitive stage, which has suffered the most with the change in governance structure following the federalization.

The process is slothful, and not all targets set for 2020/21 have been achieved. The basic issues and concerns observed are in the areas of coordination and ownership. Almost every stakeholder had similar voices, which is an alarming concern for any strategy to be implemented successfully and achieve the targets.

The structural transformation has made some of the identified policies and regulations not applicable, as they were not designed for the new structural system. Hence, there is an urgent need to revise them.

The major concern being raised in the ADS is to strengthen the capacity of research institutes and address the scarcity of input through a modern information and communication technologies, tracking and distribution mechanism to the right farmers. The NARC, the main agricultural research agency in the public sector in Nepal, is responsible for the proper research and development and NPC, MoALD, MoF and line ministries to closely work and invest resources for programs and activities. GoN should have adequate plan, budget allocation and implementation mechanism in order to meet the basic inputs such as seeds, irrigation, soils health, fertilizer, extension system, market and other diverse research sectors from NARC. However, due to a lack of financial resources, human resources and adequate technologies, the demand has not been met by the ongoing projects and programs.

Recommendation

In order to address these challenges and capitalize on Nepal's comparative advantages, it is recommended that the government focus on sectors where it has a natural advantage and consider employing a strategy of import substitution for goods that can be produced locally. To achieve self-sufficiency in major food crops, the government should adopt a "whatever it takes" approach and make significant investments in the agriculture sector.

Strong political commitment and the active and positive involvement of stakeholders are needed to redesign programs and activities as per the restructuring of the governance systems—at the federal, provincial, and local levels. A federal ADS plan of action needs to be prepared, identifying and assigning federal units responsible for carrying out specific ADS activities and achieving ADS targets. The institutional setup needs to be strengthened to effectively coordinate the ADS implementation. A powerful mechanism, possibly under the leadership of a senior minister, should be in place. The ADS coordination unit within the MoALD should also be strengthened with a team of professionals and a better logistical environment.

To support the growth and development of the agricultural sector in Nepal, promote self-sufficiency, and reduce dependency on imports, the following actions are recommended to be taken by the key stakeholders:

- In order to achieve self-sufficiency in major agricultural products by 2030, GoN should take critical approaches targeting key commodities such as rice, wheat, maize, vegetables, and pulses.
- By 2030, Nepal should aim to reduce its dependency on edible oil, fruits, and dairy products by 50 percent.
- The government should conduct a comprehensive study to determine the investment and action plan required to achieve these goals of self-sufficiency in the five major imports and a 50% reduction in dependency in the three products.
- By 2030, Nepal should aim to irrigate an additional 5 hundred thousand hectares to achieve year-round irrigation on the two thirds of total land used for producing rice.
- The use of balanced fertilizers and fertilizer blending with productivity gains of 10 to 30 percent should be expedited (Adhikari, Gauchan, and Singh, 2023).
- Soil tests should be conducted across the country, starting with areas with high potential for output.
- The NARC should be promoted for its role in research and development in the agriculture sector, MoALD and MoLMAC in efficient bureaucratic roles.
- The Nepal Rastra Bank should take steps to stop “agriwashing,” which is the allocation of credit to non-agricultural sectors under the guise of supporting agriculture. Allocation of credit to the agriculture sector has reached more than 12 percent, yet output growth has decreased from 3.5 percent in the previous decade to 2.8 percent in the current one. This suggests that credit may have been directed to other, less productive sectors under the guise of agriculture.
- The government’s farmer subsidy policy should be reviewed, and until self-sufficiency in major food crops is achieved, the supply of subsidized fertilizers should be universalized, and accessible to all farmers.
- GoN shall initiate proper implementation mechanism to the voucher system for tracking and distribution of entire facilities that GoN is planning.
- A comprehensive study should be conducted on the supply chain of both perishable and non-perishable agricultural produce to identify the layers of intermediaries and the margins added at each stage. Currently, the supply chain disproportionately favors intermediaries, putting farmers at a disadvantage. Producers bear a higher risk, while middlemen, who bear the lowest risk, reap the largest share of returns. This weak internal distribution system and long chain of intermediaries have hindered local farmers’ access to markets and fair prices for their produce, leading to high imports of vegetables despite local abundance.
- A study should be conducted on the real value added by the poultry sector, even though the country has achieved self-sufficiency.
- Measures should be implemented to encourage both land pooling and commercial farming, as well as cooperative agriculture farming through various incentives. These incentives should include irrigation facilities, the timely supply of blended fertilizers, access to finance and markets, subsidized electricity, cold storage, and duty-free agricultural equipment. These measures should be linked to the overall strategy of achieving self-sufficiency in major agricultural products.
- Quarantine facilities should be set up at key border crossings to test imported agriculture products. This will help in controlling the unrestrained import of low-quality agricultural produce from India.
- To mitigate the current hurdles of programs implementation, efficient monitoring and evaluation from the federal to local level governments is needed, and the roles of provincial

governments and local governments should be clearly defined, and measures should be implemented immediately via the updated Provincial Agricultural Development Strategy.

Overall, these policy recommendations aim to improve the efficiency and competitiveness of the agricultural sector in Nepal, supporting economic growth and lowering the rate of inflation. These measures, by promoting self-sufficiency and reducing reliance on imports, will also help to address the challenges the country is facing in its external sector as a result of rising negative trade terms.

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