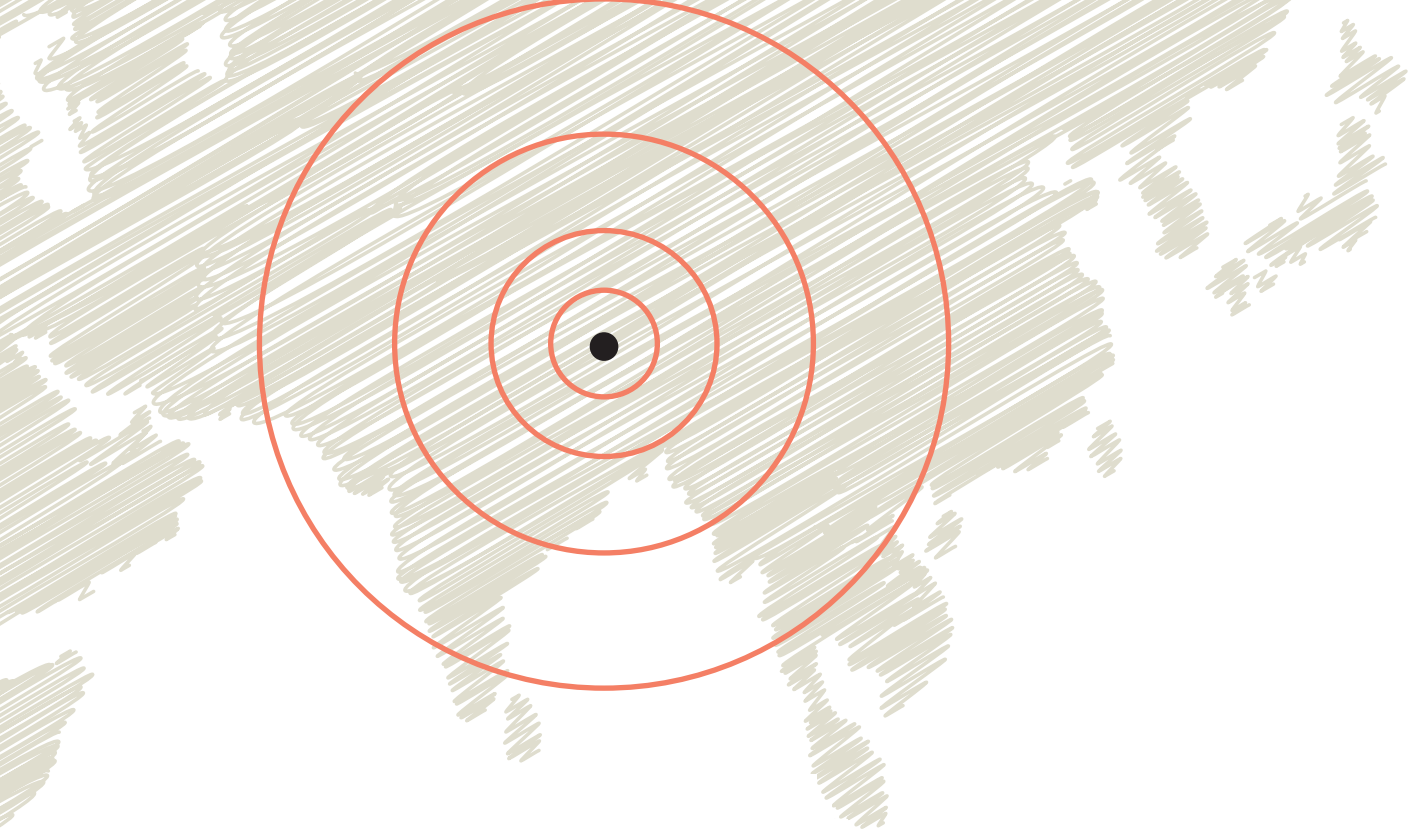


Knowledge, power and policy

The case of agricultural development in Dhading District, Nepal

Gopi Krishna Sedhain, Ajay B Mathema, Nawang Sherpa, and Binay B Adhikari

Country Report
November 2014

Food and agriculture

Keywords:
Agricultural policies, Knowledge, Evidence, Sustainable intensification, Political economy analysis

iied

About the authors

Dr Gopi Krishna Sedhain, Senior Agriculture Consultant

Ajay Bakta Mathema, Team Leader, Director, Asian Center for Environment Management and Sustainable Development (AEMS), ajaymathema1@gmail.com

Nawang Sherpa, Program Officer, AEMS

Binay B Adhikari, Research Coordinator, AEMS

Produced by IIED's Natural Resources Group

The aim of the Natural Resources Group is to build partnerships, capacity and wise decision-making for fair and sustainable use of natural resources. Our priority in pursuing this purpose is on local control and management of natural resources and other ecosystems.

Partner organisation

The mission of AEMS (Asian Centre for Environment Management and Sustainable Development) is to establish a functional partnership among the countries of Asia having common environmental issues of development, and to ensure sharing of knowledge and technology. Its main objectives are (1) to carry out research activities on present day environmental degradation and its impacts, (2) to provide consulting services and to carry out trainings, seminars and workshops in national as well as international levels to address the issues of environmental concerns; (3) to carry out development and construction works regarding management of the environment and sustainability in development, (4) to establish national and international cooperation with educational institutions like universities involved in environmental management, and (5) to establish a resource center providing information on environmental and development programmes and projects. AIMS headquarters are in Kathmandu, Nepal.

Published by IIED, November 2014

Gopi Krishna Sedhain, Ajay B Mathema, Nawang Sherpa, and Binay B Adhikari. 2014. *Knowledge, power and policy: The case of agricultural development in Dhading District, Nepal.* IIED Country Report. IIED, London.

http://pubs.iied.org/14641IIED

ISBN: 978-1-78431-110-0

International Institute for Environment and Development
80-86 Gray's Inn Road, London WC1X 8NH, UK
Tel: +44 (0)20 3463 7399
Fax: +44 (0)20 3514 9055
email: info@iied.org
www.iied.org

@iied
www.facebook.com/theIIED

Download more publications at www.iied.org/pubs

Agricultural intensification is happening in sub-urban Kathmandu, with districts such as Dhading developing market gardening to cater for the ever growing needs of the growing city. But intensification can also impact negatively on the environment, unless accompanied by appropriate agricultural and environmental policies and services. This study explores the drivers for agricultural policies and practices in Dhading, using a political economy framework that emphasises the role of knowledge in decision making.

Contents

Summary

Ecologically, Nepal is considered to be well suited for the production of many agricultural commodities and could have a competitive edge in both domestic and regional markets. Yet current productivity is not yet living up to this promise. This report explores the factors behind this unrealised potential, using the vegetable sector in Nepal as a case study.

Information, knowledge and expertise are the key to sustainable intensification. This case study applies a diagnostic tool in order to ascertain what knowledge and information is used in decision making, particularly for sustainable agricultural intensification in developing countries, and how the availability and use of this knowledge is influenced by the political context and power relations. The case study reviews and compares the use of knowledge and information at national, district and local levels in Nepal: in national agricultural policy making, in developing and implementing district agricultural plans, and by individual farmers. It focuses on the area around Kathmandu (Dhading district), which is witnessing a boom in vegetable growing, particularly during the off season after harvesting the main rice crop.

The study finds that the traditional integrated crop-livestock farming system has been changing in the district. Farmers have been gradually shifting to the commercial monoculture of crops, especially high-value vegetable crops, encouraged by high prices and promotion of vegetable production by the government. Yet the area is not particularly suitable for growing vegetables without the application of high doses of chemical fertilisers. There has been an increase in the levels of applications of chemical fertilisers (mainly urea), and this, coupled with a reduction in applications of farmyard manure and compost, has led to a deterioration of soil fertility. In some places fertility has declined to a point where farmers are abandoning vegetable production. Despite being a target area for agricultural intensification, Dhading district suffers from food shortages.

The current uncertainty over the future constitution of the country has severely impeded policy making, programme planning and implementation of agricultural research and development programmes in general and the devolution of the agricultural extension programme in particular.

The low productivity of the agriculture sector is also due to a number of other factors, including a lack of adequate incentives for producers and a lack of suitable technology and of essential production inputs, particularly seeds, fertiliser, irrigation, extension services and marketing.

The case study identifies the following essential policy changes:

- Ensure the participation of stakeholders in the planning process. Most of the agricultural policies, plans and strategies implemented to date have not been successful due to the lack of meaningful participation by farmers and other key stakeholders.
- Enhance the capacity of public institution to take on a new role as overall facilitators of agricultural research, development and extension, rather than delivering services directly.
- Ensure the supply of basic productive inputs for poor farmers.
- Increase the participatory and pro-poor focus of donor-funded programmes. Donor-funded programmes in recent years do not address the real challenges of farming communities in improving productivity and have involved very little participation by small-scale farmers and disadvantaged community groups.
- Link research, education and extension agencies. The National Agricultural Research Council should be restructured with a focus on decentralisation and increasing its responsiveness to the research needs of farmers and agro-enterprises, while fostering links within the research-education-extension triangle.
- Identify commodities with potential for intensification by involving farmers and conducting participatory mapping.
- Identify potential target areas for commodities based on their technical suitability for producing those commodities rather than administrative ease.
- Strengthen the information collection and processing system so that district-level information can be relied upon and used in the planning process.

Background, objectives and methods

1

1.1 Background to the research

Decision makers are under pressure to respond to the challenges of food and water security and climate change. They need to be aware that economic development is underpinned by the services provided by natural resources and ecosystems, for example the provision of fresh water, recycling of waste products and the moderation of the climate. They also need the capacity to take this into consideration in their decision making. Timely, reliable information on the location, potential and management requirements of natural resources such as soils, water and biodiversity, and knowledge about the complex interactions and trade-offs (e.g. between maximising productivity and reducing negative environmental impacts) are key to effective and efficient decision making on food and agriculture. Without this, there is a risk that decisions will increasingly be based on short-term considerations of politics and power, rather than by a careful analysis of the relevant information and knowledge. Uninformed and poor decisions can lead to further land degradation and more and more so-called natural disasters. As an example, the 2010 floods in Pakistan were catastrophic because deforestation and soil erosion in the catchment of the River Indus have severely reduced its capacity to retain rainfall, and because of reckless development of the flood plain without the provision of holding basins.

A number of public and private organisations in Nepal have been engaged in research and development; however this information is not easily accessible to others. In such research there is often a positive correlation of interests between politics and business players. Major decisions taken in the past by the government on land use, forestry and other natural resources – such as minerals and water – have ignored community rights and needs. As a result, the livelihoods of those who depend on such natural resources have been threatened. Consequently, there is a pressing need to:

1. Take stock of the fundamentals of food and water security, ecosystem resilience, and several intersecting and worrying trends in rural development, land use and management.
2. Identify the key requirements for information on natural resources. What kinds of information do policy makers, planners, investors and managers need if we are to ensure food security and adapt to climate change? What information do they actually use and how good is this information?
3. Assess the capabilities of organisations that generate and maintain natural resource information.
4. Develop new policy and capacity-development guidelines to rebuild the cadre of specialists and the knowledge infrastructure needed to ensure effective delivery of key natural resource information.

1.2 Objectives of the case study

In response to these challenges, IIED has developed a draft diagnostic that may be used to ascertain what knowledge and information is used in decision making, particularly for sustainable agricultural intensification in developing countries, and how the availability and use of this knowledge is influenced by the political context and power relations. It aims to provide a framework for research, interviews or round-table discussions that seek to identify knowledge gaps, how users can better articulate what knowledge/information they need, and how knowledge intermediaries can be strengthened.

IIED has used a framework developed by the Overseas Development Institute (ODI) as a prototype for this diagnostic. The diagnostic has been tested in two case study countries: Nepal and Burkina Faso. The Asian Centre for Environment Management and Sustainable Development (AEMS) was commissioned by IIED to undertake the Nepal case study. This case study reviews and compares the use of knowledge and information at national, district and local levels in Nepal: in national agricultural policy making, in developing and implementing district agricultural plans, and by individual farmers. It focuses on the area around Kathmandu (Dhading district; Figure 1), which is witnessing a boom in vegetable growing, particularly during the off season after harvesting the main rice crop.

The primary objectives of this study were:

- to test the diagnostic tool
- to provide stakeholders with an analysis that might help them identify barriers to evidence-based decision making, and motivate them to address these barriers.

1.3 Methods used

Having access to relevant knowledge and information is not enough for evidence-based decision making. Decision makers have to balance a wide range of interests and are subject to many influences, of which scientific knowledge is only a relatively small part. More importantly, knowledge is not value-neutral – much knowledge is contested and different groups attach different weight to it. An NGO activist would, for example, be more likely to listen to a farmer's concerns about environmental impacts of agri-business expansion than a private investor in such businesses. Some knowledge providers are more credible and respected than others, perhaps because they are used

Figure 1. Project location

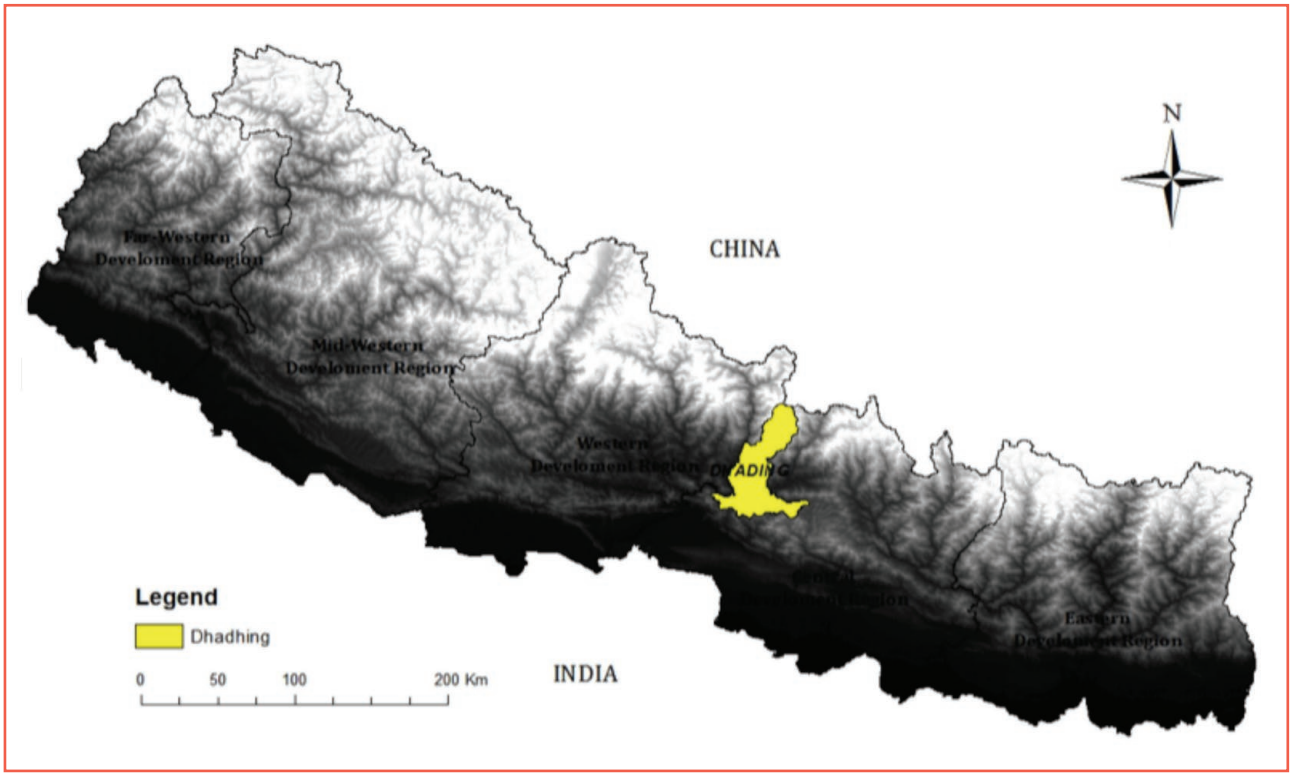
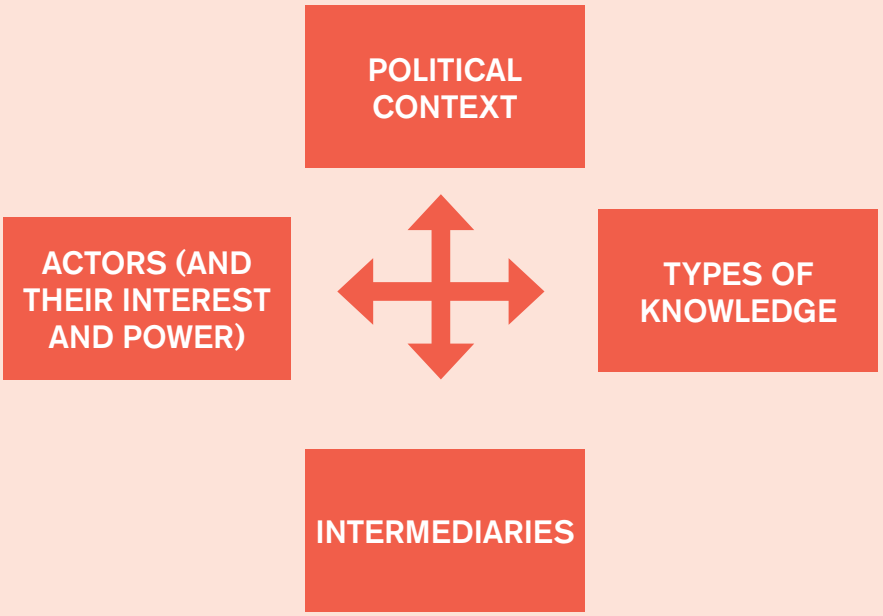


Figure 2. Framework for exploring knowledge, policy and power in international development



Jones, H., Jones, N., Shaxson, L. and Walker, D. (2012) Knowledge, policy and power in international development. Bristol: The policy press.

by senior government members. Our understanding of the importance of power and the political context in which decisions are taken is crucial in understanding what information and knowledge is demanded and used by whom.

IIED uses a framework of analysis that considers four interrelated components (Figure 2).

In the context of sustainable agricultural development, the aim is to understand how these four components work together to create (or hinder) evidence-based decision making. For each of the four components, the IIED diagnostic proposes a number of questions (adapted to the specific context of the case study):

1. **Political context:** who has the strongest voice in policy debates? What checks and balances are in place to ensure that weaker voices can be heard? For example, are there systems to ensure that the concerns of local communities and farmers are taken on board, as well as those of ordinary citizens?
2. **Actors:** how do the interests of the various actors coincide or conflict with each other? Are there strongly held values and belief systems which affect this? Who is seen as credible in policy debates? Who is influenced by whom?
3. **Types of knowledge:** which types of knowledge are used in policy debates and in decision making? Where does this knowledge come from? What type or source of knowledge is dominant?
4. **Intermediaries:** these are people and organisations that translate knowledge into formats that are accessible to different types of users (for example, NGOs simplifying maps in order to use them for participatory planning with rural communities). Are there any intermediaries – organisations or individuals – which specifically work across the interface between knowledge and policy? How do they work and what effect do they have?

In order to test whether the IIED diagnostic – underpinned by the ODI framework (Figure 2) – can be usefully applied to real-life agricultural decision-making processes, the following steps were carried out.[1]

Background review and questionnaire formulation

A background desk review analysed the structures, modalities, operation, drivers and challenges of Nepal's agricultural policy and system, and of district agricultural planning processes and actors. AEMS also worked with IIED to customise the IIED diagnostic framework and develop checklists of relevant questions for the key stakeholder groups addressed in this study: national and district government offices, farmers, the private sector and research organisations.

Stakeholder analysis

An initial stakeholder analysis was undertaken to identify those key actors involved (at national to local levels) in agricultural planning and vegetable production: government departments/institutions/agencies, donors, the private sector, non-governmental organisations (NGOs) and farmers' organisations. This was accompanied by an analysis of their motives, objectives, role, responsibilities, and the information they use. The stakeholder analysis also helped to identify the important stakeholders for the case study. This was followed by an initial round of meetings and interviews with key actors, and some short focus group sessions with farmer groups and co-operatives. The interviews were held from 4 to 14 March 2013 in the field, leading to further interviews and meetings by the research team to continue the work.

Case study

The case study area – Dhading District – is one of the major vegetable-producing districts in central Nepal. The case study explores the current vegetable production status in Dhading District and the potential for and constraints to the sustainable production and marketing of fresh vegetables.

Given the varied geographic and agro-climatic conditions, demographic composition, level of intensification of agricultural intensification and accessibility, three Village Development Committee (VDC) areas were visited during the study. Box 1 provides some background information about their populations.

The following issues will have a direct impact on the sustainable intensification of vegetable production and marketing in the district; these are explored further in the chapters which follow:

- availability of and access to irrigation facilities
- access to critical production inputs (e.g. suitable vegetable seeds, fertiliser, pesticides, credit)
- access to extension services, especially demonstration and training to farmers on improved vegetable production technologies such as organic production, integrated pest management, integrated soils nutrients/fertility management
- the vegetable marketing system.

[1] Some reflections on the process are contained in Annex II.

BOX 1. POPULATION STATUS OF THE CASE STUDY AREAS

1. Gajuri VDC

Recent survey reports show that there were 2,223 households with a total population of 10,035 in Gajuri VDC in 2011. The population is comprised of 4,968 males and 5,067 females (CBS, 2012). The dominant caste is Brahmins followed by Tamangs and Dalits (Intensive Study and Research Center, 2008).

2. Dhussa VDC

The 2011 survey of this VDC area records 1,361 households and a total population of 7,190 (3,548 males and 3,642 females) (CBS, 2012). The dominant caste is Chepangs (Dhussa has one of the highest population of Chepangs of all VDCs), followed by Brahmins and Newars (Intensive Study and Research Center, 2008).

3. Nilkantha

In 2011 there were 5,255 households and a total population of 20,182 (9,406 males and 10,776 females) (CBS, 2012). The dominant caste is Newars followed Gurungs (one of the highest populations of Gurungs of all VDCs), Kshetris, and Brahmins (Intensive Study and Research Center, 2008). Nilkantha VDC has one of the highest literacy rates amongst the VDCs in Dhading District, since this VDC is also the district headquarters.

Case study context

2

In Nepal, agriculture provides one of the main sources of income and a livelihood for 60 per cent of the rural population (MOAD, 2009). In 2011/12, the agricultural sector contributed 515,767 million Nepali Rupees (NRs, or US$ 5.73 million) and the non-agricultural sectors NRs 952,850 million (US$ 10.58 million) to the national economy (CBS, 2012).

This national picture is reflected in the fact that 75 per cent of income in the case study district of Dhading comes from agriculture, followed by jobs in construction (15 per cent), and other unskilled labour (10 per cent) (DDC, 2012). Various tourist resorts, restaurants and rafting activities provide local employment. In addition, Dhading is a major supplier of crushed stone and sand; many stone crushers are located along the Prithvi and Tribhuvan highways, providing local people with employment opportunities (GEC, 2002).

The district supports 2,076 registered cottage industries and 1,312 small industries. A total of 3,548 people employed in these industries have received skill development training (DDC, 2010). The district is easily accessible by all-weather motorable road and most agricultural areas are connected to fair weather roads.

Dhading is in the Bagmati Zone of the Central Development Region of Nepal. The district is 90 kilometres from Kathmandu and covers a total area of 1,926 km^2. The district headquarters are in Dhading Beshi in the area of the Nilkantha Village Development Committee (VDC). Dhading District is surrounded by Kathmandu and Nuwakot districts to the east, Gorkha District to the west, and Makwanpur and Chitwan districts to the south. It shares a border with Rasuwa District and China to the north.

Dhading has 3 electoral constituencies, 13 *Ilaka,*[2] 50 Village Development Committees, 5 Exemplary Village Development Committees and 2 Town Development Committees. The total population of Dhading District is 336,067 with 157,834 men and 178,233 women (CBS, 2012). The average annual growth rate is 1.97 per cent (MOLD, 2012). The demographic characteristics of the district are presented in Table 1.

About 63 per cent of the population above five years of age can read and write; however, their education level is unclear. Most of the inhabitants are Hindu (Table 2), and Nepali is their mother tongue, although other indigenous languages are also spoken (CBS, 2012).

Table 1. Households, population and population density, Dhading District

Total Household	Population			Area (sq. km)	Average household size	Sex ratio	Population density (Pop/Sq.Km)
	Total	Male	Female				
73851	336067	157834	178233	1923	4.55	88.6	174

Source: (CBS, 2012)

Table 2. Population by religion

SN	RELIGION	MALE	FEMALE	TOTAL	%
1	Hindu	114484	128900	243384	72.42
2	Buddhism	32197	36916	69113	20.57
3	Islam	606	428	1034	0.31
4	Kirat	14	12	26	0.01
5	Christianity	9905	11338	21243	6.32
6	Prakriti	405	412	817	0.24
7	Bon	2	1	3	0.00
8	Jainism	1	1	2	0.00
9	Bahai	18	27	45	0.01
10	Undefined	202	198	400	0.12
	Total	157834	178233	336067	100.00

Source: (CBS, 2012)

[2] *Ilaka*: A political division of a district. Each district is sub-divided into 11 to 17 *Ilakas* depending on the population and physical areas of district.

2.1 Physical environment and land use

Dhading is divided into three zones: high Himalaya, high mountains and the mid-mountains. Crops are cultivated only in the latter two zones (DADO, 2012). The mid-mountain region is the most cultivated area of the district.

The highest point in the district is Mt. Pabil (7,110 metres) and the lowest is at Jogimara (300m; Figure 4). Average annual precipitation throughout the district ranges between 1,912 mm and 3,535mm (District Agriculture Development Office, 2012). Dhading has 25 major rivers (including the Budhi Gandaki, Aanku and Trishuli), as well as over 1, 700 small rivers and streams (DADO, 2012).

The district contains 67,450 hectares of forest, 15,941ha of pasture, 35,300ha of cultivated land and 44,107 ha are under other forms of land use (DADO, 2012) (Table 3 and Figure 3).

2.2 Soil and fertility

The most common soil types found throughout Dhading District are loams, both sandy and silty. The soils are generally acidic, probably due to the high level of precipitation in Middle Nepal which causes heavy leaching of water-soluble nutrients. Similarly, topsoils here have only a medium level of organic matter. In general, soil nitrogen levels are low due to leaching or volatilisation. In some areas, however, topsoil have medium nitrogen content due to the continuous application of nitrogenous fertiliser aimed at increasing crop yields followed by decaying of vegetation (GEC, 2002).

Interactions with stakeholders and key farmers during field visits revealed that the traditional integrated crop-livestock farming system has been changing in the district. Farmers have been gradually shifting to the commercial monoculture of crops, especially high-value vegetable crops. There has been an increase in the levels of applications of chemical fertilisers (mainly urea), and this, coupled with a reduction in applications of farmyard manure and composts, has led to a deterioration of soil fertility.

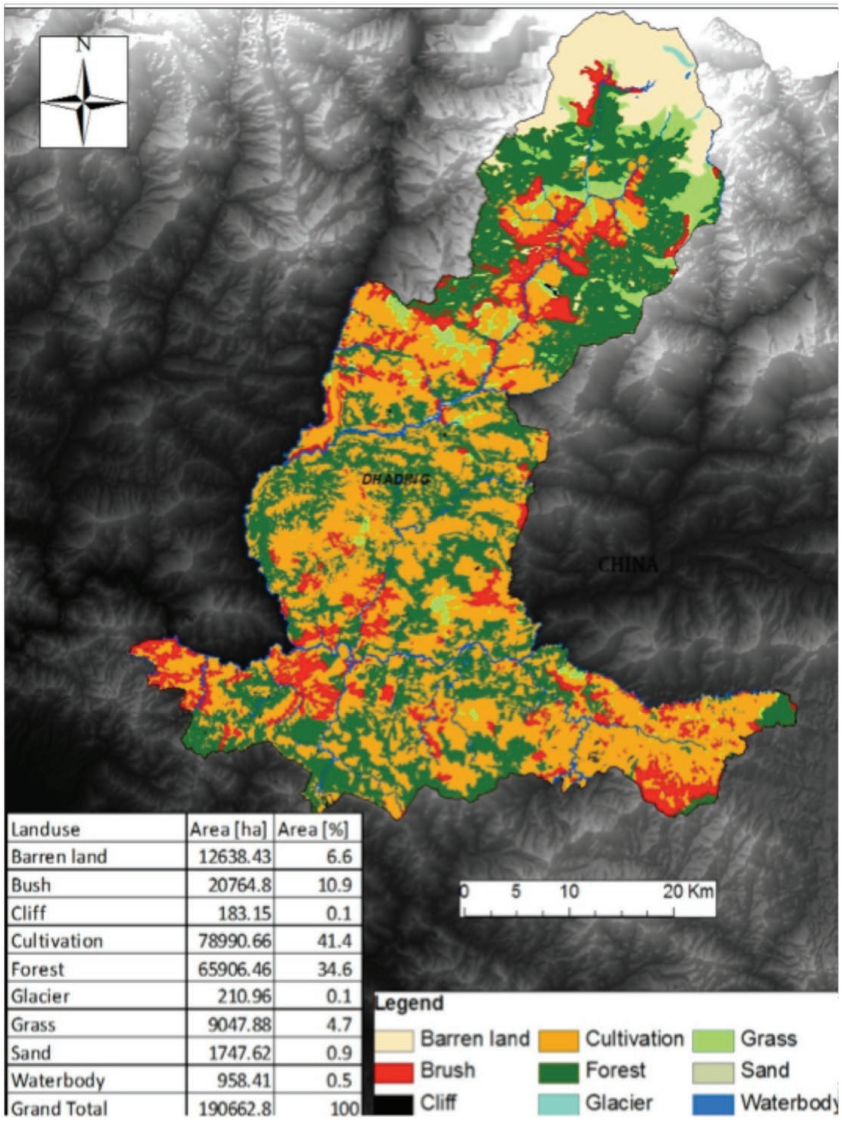
Given the overall agro-climatic conditions, particularly the texture and chemical properties of the soil (mostly sandy loam in floodplains and clay in the uplands), the area is not particularly suitable for growing vegetables without the application of high doses of chemical fertilisers. Levels of organic matter and available nitrogen, phosphorus and potassium in most of the areas seem very low and overall soil fertility is poor. Likewise, most of the vegetable growing areas are terraced slopes where flood irrigation causes high rates of erosion. Farmers have only been able to grow vegetables with high level of inputs such as chemical fertilisers and water because they get good prices for the vegetables. Farmers who had been producing vegetables for some years told us that the overall productivity of land has decreased considerably and they do not want to continue growing vegetables any more in those areas. This is a serious issue and should be investigated properly before planning further expansion of the vegetable production areas in the district. The study shows that the District Agriculture Development Office (DADO) should prepare a detailed technical suitability mapping of the district prior to declaring any area suitable for commercial vegetable farming.

Table 3. Land use patterns in Dhading District

MAJOR LAND USE TYPE	AREA (HA)
Forest	67450
Agriculture	
Cultivated	35300
Non-cultivated	19343.4
Pasture	15941
Landslide	10345
Others (residence, river, rock, roads etc)	44107.6

Source: (DADO, 2011)

Figure 3 Dhading District land use map (Source: Survey Department)



Landuse	Area [ha]	Area [%]
Barren land	12638.43	6.6
Bush	20764.8	10.9
Cliff	183.15	0.1
Cultivation	78990.66	41.4
Forest	65906.46	34.6
Glacier	210.96	0.1
Grass	9047.88	4.7
Sand	1747.62	0.9
Waterbody	958.41	0.5
Grand Total	190662.8	100

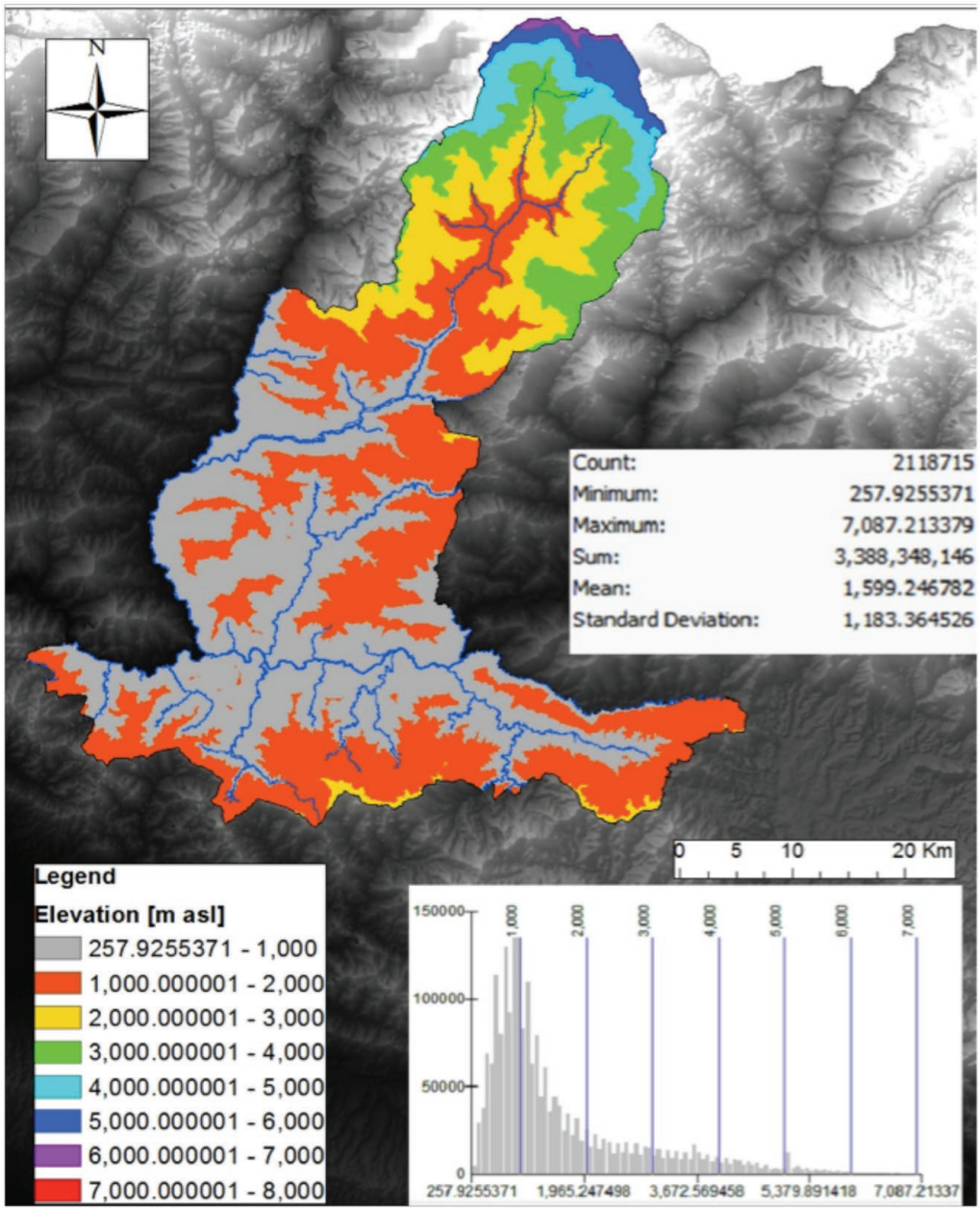
2.3 Agricultural production: local deficits and import dependency

Dhading District ranks as one of the best in Nepal for agricultural development, given its infrastructure and good access to basic services. But these services are concentrated in the accessible areas along the roads and at district headquarters; they are not available to the majority of the small and marginal farmers, particularly in the remote rural areas.

Although arable agriculture is the main economic activity in Dhading, it is widely supplemented by dairy products, fishing, tourism, etc. Generally local farming is mainly at a subsistence level, with some commercial orange growing in Charaundi Bazaar, and vegetables cultivated in the area bordering Kathmandu district. The total area of arable land in Dhading District is 73,345 hectares (DDO, 2012). Of this, 48,136ha are suitable for farming, with 35,300ha actually farmed (DDC, 2012).

Dhading produces a wide range of agricultural products. These include paddy rice, wheat, maize, millet, potatoes, and various seasonal and off-season vegetables. Moreover, the district is one of Nepal's major producers of milk and milk products (GEC, 2002). Milk and meat products, as well as leather production, contribute significantly to local incomes (MOAD, 2009). In 2011/12, livestock in Dhading District numbered 133,294 cattle, 108,924 buffaloes, 6,028 sheep, 14,287 goats, 21,513 pigs, 943,154 chickens and 7,286 ducks. 35,106 metric tons of milk were produced (cow and buffalo), and 4,748 metric tons of meat.

Figure 4. Dhading District elevation map (Source: Survey Department)



The district is one of the major vegetable-producing districts in central Nepal, producing 18,977 metric tons of fruit, 74,458 metric tons of vegetables, and 87,888 metric tons of grain in 2012/3. It has been designated as a "pocket area": agriculture-based special economic zones that are directed towards promoting Nepalese agriculture, livestock products and commodities which have a comparative advantage (Box 2 and Table 4). The programmes in these pocket areas are carried out in partnership with government, co-operatives and the private sector. They work on product development, processing centre establishment and markets and market infrastructure promotion (NPC, 2007).

Despite being a target area for agricultural intensification, Dhading suffers from food shortages. Though its total food demand in general is 80,882 metric tons, the total processed food supply stands at 47,393 metric tons and the food grain deficit is estimated at 33,489 metric tons (DDC Dhading, 2012). This food deficit is met by supplies from other districts of Nepal and India. The public-private salt trading corporation plays a pivotal role in supplying salt, rice, wheat and other food products at minimal cost throughout Nepal.

BOX 2. AGRICULTURAL POCKETS

Dhading is considered to have potential for intensive agriculture production. A number of agricultural development programmes encouraging intensification have been implemented by the Ministry of Agriculture Development (MOAD) through the DADO/DLSO Agriculture/Livestock Service Centres established in the district.

An example of this is MOAD's pocket package programme for commodities with good local potential. Examples include paddy, maize, wheat, potatoes, vegetables, honey bees, oranges, bananas, mango and litchi. Similar programmes for livestock include buffalo, cow, goat, sheep, pig and poultry.

The pocket package programme aims to increase production of the targeted commodities by providing training, subsidised seed and agricultural equipment/machinery, and some grants in the form of revolving funds to farmer groups and co-operatives.

Pocket areas are selected for their accessibility, irrigation infrastructure, markets, support services to farmers, number of farmers already doing some work on the selected commodities and local interest in further increasing production. Most pockets areas in the district have been selected for farmers' knowledge and practices rather than the suitability of the areas based on technical parameters such as soil type, topography, and potential for further expansion.

In Dhading District there are 32 pocket package programmes involving 116 farmers' groups. The overall programme covers about 1,625 hectares. There is more than one pocket for each commodity in the district.

When it comes to livestock, the buffalo pocket area lies in Baireni, Goganpani, and Benighat VDCs. The goat pocket area is in Sunaulabazar, Maidi, Chanipur, Nalang and Kumpur VDCs. Other pocket areas are Bhumesthan VDC for poultry, and Nilkantha VDC for pigs.

Table 4 lists the existing pocket package programmes in Dhading District.

Table 4. Pocket programmes in Dhading

S. NO.	SERVICE CENTRE	NO. OF POCKET AREAS	AREA COVERED BY THE POCKET AREA (HA)	NO. OF FARMERS' GROUPS INVOLVED
1	ASC, Darkha	2	15	6
2	ASC, Tripureshwor	2	68	6
3	ASC, Sunaulabazaar	5	301	18
4	ASC, Maidi	5	30	24
5	ASC, Naubishe	3	144	11
6	ASC, Gajuri	3	88	12
7	ASP , Dhading-beshi	5	13	9
8	ASP , Salyantar	2	6	8
9	ASP, Benighat	5	960	22
Total		32	1625	116

ASP: Agriculture Service Contact Point; ASC: Agriculture Service Center

Source: (DADO, 2012)

Nationally, it has been reported that annual imports of fresh vegetables, particularly from India has been increasing every year, with the last fiscal year (2012/13) seeing Nepal import vegetables worth NR 45,460,000 - about 75 per cent more than the previous year (NR 25,850,000 in 2011/12) (NRB, 2013). The value of imports could be even higher since imports of agricultural commodities from India are not taxed and therefore not recorded by customs. This issue is discussed in more detail in Chapter 3, and Annex I contains some key vegetable statistics for Nepal.

The market for vegetables is consequently highly unstable. At the Kalimati Fresh Fruit and Vegetable Market – the largest market in Kathmandu, trading about 700 tons of fruit and vegetables a day – supplies have been known to reduce to about 500 tons per day and average vegetable prices to increase up to 30 per cent within one week (see Annex 1).

Land

A total of 58,749 households are involved in farming in the district. Most households own some land but 206 households are completely landless (2 per cent). Sixty-eight per cent of households have more than one hectare of land, and 30 per cent less than one hectare (DDC, 2012).

Irrigation

The study shows that irrigation facilities are limited and less than 40 per cent of cultivated land is irrigated, meaning farmers have been taking high risks in cultivating land relying only on uncertain rainfall. Traditionally farmer-managed irrigation systems have been gradually brought under public management, and their overall performance has been decreasing over the years. There is continual need to increase access to irrigation through the expansion of command areas. New irrigation schemes need to be conducted in the most economical and equitable manner across the district, while increasing the efficiency and intensity of existing irrigation.

As part of promoting agricultural intensification, the government has been investing considerable funds in improving access to irrigation facilities for farmers. In Dhading, there are currently 53 completed irrigation projects, and eight under construction. The total irrigated area is 15,965 hectares. This compares to 19,343ha of non-irrigated land, either where there are no water sources or where the land is unsuitable for irrigation due to steep slopes. Of the total irrigated area, 4,645ha are irrigated throughout the year and 11,320ha receive irrigation during monsoon season.

Besides government and community-managed irrigation systems, the District Agriculture Development Office (DADO) has been implementing small and co-operative-managed irrigation schemes for the past 10-12 years in the district. The small irrigation programmes irrigate 1,247 hectares, and co-operative irrigation programmes cover another 113ha. Traditional methods allow the irrigation of a further 3,755 ha, but only during the rainy season.

Climate

Interactions with farmers in the field found that they were experiencing the impact of climate change: irregularity in the monsoonal rains; rapid drying up of water sources; prolonged dry spells, droughts and floods; and increased incidence of plant and animal epidemics. In order to improve farmers' resilience, comprehensive policy measures should be taken for the effective implementation of Nepal's National Adaptation Programme of Action (NAPA).[3]

2.4 Key agricultural actors

District Development Committee: planning and extension

The District Development Committee (DDC) of Dhading is responsible for the development of the various sectors of the district including agriculture, rural drinking water, hydroelectricity, irrigation, and tourism (DDC, 2012).

As part of a government policy to strengthen decentralisation under the Local Self Governance Act (LSGA) of 1999,[4] central government also devolved its centralised extension service to the DDCs in 2002/03. The aim was to increase the effectiveness and efficiency of the centralised public extension system. It also wanted to ensure the participation of local stakeholders in the planning, implementation and monitoring of agricultural development programmes at the district level.

Since 2002, the DDCs have been administratively managed by the Ministry of Federal Affairs and Local Development (MoFALD). This means that the current extension system effectively operates under two ministries, namely the MOAD and MoFALD. Most of the power and authority – including recruitment, transfer

[3] See www.undp-alm.org/projects/nepal-national-adaptation-programme-action-napa.
[4] The act envisaged devolving political, institutional, fiscal and financial power to local bodies and placing the planning and management responsibilities at local level. Clause 257 of the act requires each DDC to establish agriculture and livestock sections.

and career development for extension staff and budget allocation – are still controlled by MOAD. Though the Interim Constitution of Nepal, national periodic plans, including the Three-Year Plan (TYP), and agriculture policies and strategies are supportive of a decentralised extension service, its effectiveness has not yet been assessed (MOAD, 2013).

Ministry of Agricultural Development

Currently, there are three departments under MOAD: i) the Department of Agriculture (DoA); ii) the Department of Livestock Services; and iii) the Department of Food Research and Quality Control. Each department has its own administrative structure and provides extension services from the centre to district level through various central directorates, regional directorates and offices, and district offices. The Departments of Agriculture and Livestock Services are among the largest departments of the Government of Nepal, having a national network covering all of Nepal's 75 districts and operating down to village level. Their mandates are to provide extension services to farming communities. Since their establishment in 1955, however, the departments have also conducted some applied research in agriculture and livestock to develop suitable technologies, verify developed technologies in the field and provide the necessary inputs to help farmers adopt improved farming technologies.

DADO and DLSO

The District Agriculture Development Office (DADO) and District Livestock Services Office (DLSO) of the Ministry of Agriculture Development are responsible for overall agriculture and livestock development in the district. In addition there are six Agriculture/Livestock Service Centres (ASCs/LSCs), and three Agriculture Service Contact Points (ASPs) (Table 5). The Agriculture/Livestock Service Centres are meant to provide technical services to farmers, including proven agriculture/livestock technologies, minor infrastructure (e.g. small and micro irrigation), agricultural marketing and value chain development (support to farmers and their groups).

However, stakeholders in Dhading District commented that the existing DADO/DLSO capacity – including physical, human and financial – is limited and does not cover the potential pocket areas in the district. It was reported that each ASC/LSC has to provide services to at least three VDCs and in some cases up to 11 VDCs. All agriculture/livestock extension services are provided through farmers' groups formed by the ASC/LSCs operating in those VDCs.

With the expansion of the pocket package programmes in the district, DADO has been supporting farmers' groups and co-operatives to establish and strengthen agricultural marketing infrastructure. It was reported that the DADO, with support from DDC/VDCs and NGOs, has constructed or rehabilitated a number of market centres in the district where farmers can easily sell their agricultural and livestock products. The popular agricultural markets in the district are Dhading Besi, Arughat, Gajuri, Malekhu and Charaudi, amongst others (DDC, 2012).

Interviews with stakeholders in Dhading District and in Kathmandu revealed the following facts about the existing agricultural planning and implementation process:

- The district extension programme has been fully decentralised during the past decade. The extension programmes are planned and approved by the District Development Council (DDC) whose members represented major political parties active in the district, the district federation of chambers of commerce, concerned district line agencies of the government including the DADO, and a few invitees from civil society organisations. The programmes were forwarded to the line ministry concerned for incorporation into the national annual development plan approved by the National Planning Commission (NPC). The NPC approves the annual plan and budgets are provided to district government offices through the DDC
- The DADO is fully involved in the formulation of annual extension programmes for the district. However, all DADO staff are still under the central government, the extension programme is under the DDC and a lump sum budget is provided by the Department of Agriculture (DOA) through the DDC.
- The district agricultural extension programmes are revised once the budget is provided by the Ministry of Agriculture Development and implemented once approved by the DDC.
- The annual budget for implementing the district agricultural programmes has not increased over the last few years. The total budget of the DADO in the past fiscal year was about NR 15 million. However, the DDC also allocates some additional funds to approved agricultural programmes from its internal sources. It is reported that DDC has provided additional budget of NR 500,000 in the current financial year for managing citrus orchards in the district.
- The government has issued a directive that, from this fiscal year onwards, all DDCs must allocate at least 15 per cent of VDC grants to agricultural programmes. However, this provision is yet to be fully implemented by all VDCs in the district since a majority of the politicians prefer to allocate funds for infrastructure projects such as roads, bridge and trails.

Farmers' groups

Farmers' groups are the main target group for extension by the Ministry of Agriculture Development in Nepal. Most of the major agriculture and livestock extension programmes initiated by DADOs and DLSOs are implemented through such groups (Table 5). NGOs also implement their programmes through farmers' groups.

Many farmers' groups are inactive (Table 6). This would seem to be due to lack of adequate support from the DADO and DLSO. Interactions with farmer groups during the study reveal that most of these groups are formed in the hope of receiving some support (seeds, training and subsidies for construction and rehabilitation of small infrastructure such as irrigation canals, marketing centres, etc.). But without continuous support from the DADO or DLSO, most of the groups have become inactive.

Another reason cited for increasing number of inactive groups is the feminisation of agriculture as young men leave the area to work elsewhere. Most young people in the villages are not interested in agriculture and are gradually leaving farming. This has resulted in a huge demand for agricultural labour throughout the country and is causing agricultural production to decline at an alarming rate as considerable numbers of farming families have been leaving the land uncultivated due to a lack farm labour. It is estimated that about 140,000 hectares of cultivated land was left fallow in the fiscal year 2012/13 (Kantipur Daily, August 9, 2013).

On the whole, only 38 per cent of groups were reported to be active in the district in 2012. Of these, 46 per cent of male group members and 29 per cent of the women members were reported to be active (DDC, 2012).

Non-government and private service providers

In addition to government agencies, there is an increasing number of non-government and private agricultural service providers in the district. These include Agro-vet (a private company that deals primarily in seeds, farm implements, pesticides, veterinary medicines and veterinary equipment), NGOs and community-based organisations, and individual Local Service Providers (LRPs). However, there is a lack of co-ordination between these providers, and most

Table 5. Farmers' groups in Dhading District

SERVICE CENTRE	TYPES OF FARMERS' GROUPS REGISTERED BY DADO									
	WOMEN'S GROUP		MEN'S GROUP		MIXED GROUP			TOTAL MEMBERS		
	# groups	Total members	# groups	Total members	# groups	Female members	Men members	# groups	Female	Male
ASC, Darkha	4	56	0	0	16	101	191	20	157	191
ASC, Tripureshwor	22	85	0	0	12	111	129	34	196	129
ASC, Sunaulabazaar	8	162	4	50	27	443	305	39	605	355
ASC, Maidi	16	372	3	53	43	806	518	62	1178	571
ASC, Naubishe	8	190	6	153	16	324	375	30	514	528
ASC, Gajuri	9	167	0	0	27	238	811	36	405	811
ASP, Dhadingbesi	15	222	1	9	38	326	247	54	548	256
ASP, Salyantar	0	0	0	0	11	68	122	11	68	122
ASP, Benighat	3	62	1	15	8	62	94	12	124	109
Total	85	1316	15	280	198	2479	2792	298	3795	3072

ASP: Agriculture Service Contact Point; ASC: Agriculture Service Centre

Source: DADO (2012)

Table 6. Farmers' groups by category

TYPE OF FARMER GROUPS	PROPORTION OF ACTIVE GROUPS (%)	PROPORTION OF MEMBERS ACTIVE IN THE GROUP (%)	
Women	28	33	
Men	67	63	
Mixed	40	45 (Male)	44 (Female)
Overall	38	46	29

Source: DDC Dhading, 2012

of them are concentrated in commercial pockets where business is good for selling agricultural inputs, particularly seeds, pesticides and veterinary medicines, small surgical equipment, and small farm equipment such as micro irrigation, tools, and so on.

This chapter has provided the context of the case study area, allowing us to move on to apply the knowledge, policy and power framework to understand the factors promoting and hindering sustainable agricultural development in this district.

The knowledge, policy and power framework applied to Dhading District

3

3.1 Political context: conflict, power vacuums and instability

Nepal's development process was greatly affected during the armed Maoist insurgency period (1996-2006), when most of the rural areas were effectively under the control of the Maoist rebels and the government was confined to operating from the district headquarters. After the signing of the Comprehensive Peace Agreement (CPA) between the then seven-party alliance and the Maoist Party in 2006, political life gradually normalised in Nepal. Despite this peace settlement, different political organisations, particularly in the Southern Plain of the Terai, began armed conflict and the district's overall development process was still confined to limited numbers of accessible areas.

The decade-long Maoist insurgency indirectly contributed to the commercialisation of agricultural production in accessible pockets in some districts. During this period, most of the political leaders and rural elites were displaced from their homes and gradually resettled either at district headquarters or in Kathmandu. The increase in population in the district headquarters and in major cities of the country increased the demand for food, particularly fresh vegetables, fruits, milk and meat. In response, a considerable number of farmers began to produce high-value agricultural commodities on a commercial scale in and around the Dhading district headquarters and along the Prithvi Highway (Kathmandu-Pokhara). This was not particularly promoted by government agencies; rather farmers based this new development on their own experience and judgement of marketing opportunities. Government agencies and other service providers, such as international NGOs, agricultural vets and traders, also concentrated in the accessible areas of the district.

The political context has had other noticeable impacts on the agricultural sector – both nationally and locally – as discussed below.

Agricultural planning and policy making tends to be top-down and donor-driven

- The political situation in Nepal has both positive and negative consequences for policy and planning. Currently, Nepal's 13th interim Three-Year Plan is being implemented. There has been almost no attention paid to sustainability concerns in policy formulation and the formulation of important policies is on hold since they require parliamentary discussion and approval, and there is no parliament at the moment. In this situation, practical policies are prepared, approved and implemented by the government rather easily. For instance, the government has formulated and implemented a crop and livestock insurance policy without framing a suitable act. While new acts and regulations are being prepared by the Ministry of Agricultural Development, including the Pesticide Act (amendment), a new Agricultural Market Act and a new act on contract farming, in the absence of a parliament, these remain pending and cannot be debated or passed. The absence of parliament has also blocked some new initiatives, such as the programme on the resilience of agriculture to climate change which has been pending since 2012.

Prior to 2004, Nepal had no explicit agricultural policy. A comprehensive national agricultural policy was formulated in 2004, but the political instability has greatly affected its implementation. Agriculture was not prioritised in the National Development Plan after the political change of 2007 and none of the governments formed after 2007 have given due attention to agricultural development. However, a number of new agricultural programmes have been formulated by a selected team of technocrats either under the influences of key donors such as the World Bank, the Asian Development Bank (ADB), the UK Department for International Development (DFID) and the United States Agency for International Development (USAID), or in the interest of the Minister for Agriculture Development (Box 3). Policies and programmes are highly influenced by the personal interests of ministers, political leaders of the ruling party and senior technocrats in the Ministry of Agricultural Development (MOAD).

The MOAD has been preparing an Agricultural Development Strategy with the assistance of 12 major donor agencies (ADB, World Bank, Food and Agriculture Organization, International Fund for Agriculture Development, World Food Programme, United Nations Development Programme, UN Women, DFID, GIZ, Danida, the Swiss Agency for Development and Cooperation, and the Netherlands Development Organisation) and by engaging major stakeholders involved in agriculture development in Nepal. However, most of the senior officials interviewed during this study, both in the district and in Kathmandu, felt that the strategy is unlikely to be implemented effectively as the majority of the stakeholders consider the document to have been produced mainly by the consultants engaged by the donors, and thus effectively 'imposed'.

In spite of the Local Self Governance Act, there is only minimal participation of civil society and farmers in the formulation and implementation of plans for agricultural development. Accountability is limited to administrative regulation rather than to outcomes and performance. The lack of any effective participation and accountability mechanism is sometimes bridged by the politicisation of issues, often leading to inaction or conflict. The

broader participation of civil society, and particularly marginal groups, is often manipulated by interest groups and does not necessarily reflect the interest of the marginalised groups (MOAD, 2013). Farmers' concerns are seldom reflected in policies. All new policies and programmes are introduced at the behest of vested interest groups to attract donors and are often grossly misappropriated by selected interest groups, including politicians. MOAD has not developed any institutional mechanisms for participatory policy formulation involving stakeholders at different levels. All the new programmes and activities have been planned and put forward by individual officers responsible for different commodities and programmes at directorate and department levels.

How does this play out in the case study district? The limited budget of the National Planning Commission means that most of the agricultural programmes approved by the DDC in the district have not been implemented. It is estimated that only about 10 to 12 per cent of farmers, chiefly those in the accessible and pocket areas of the district, have access to government extension services and materials, and financial subsidies provided by the DADO. Interviews with representatives of farmers' groups and co-operatives found that they are not represented in the decision-making process at district level and their demands and needs are often ignored by the DDC in finalising the district development plan. Furthermore, MOAD has no explicit guidelines for implementing subsidy schemes and the poorest of the poor farmers have not benefited. It has been observed that most small and poor farmers have no access to the subsidised inputs, materials and services although they are often sold through co-operatives and traders.

It can be concluded that the prolonged political instability has not only impeded the shaping of many national development policies, but has also created a favourable environment for the emergence of many vested interest groups (middlemen, private services and inputs suppliers, international NGOs, and donors). The latter have played a key role in the formulation and implementation of policies and programmes in the agriculture sector.

Agriculture: low priority and low investment

Agriculture never receives priority during the formulation of the national development plan and thus receives a lower budget allocation than quick-impact projects such as infrastructure development and social sectors such as health, education and providing social security. The annual budget allocation for the agriculture sector is less than 3 per cent of the total annual budget.[5] The allocation to agricultural research was less than 0.5 per cent of the total national development budget in 2012. Under these circumstances, the MOAD has been unable to run most of its successful and priority programmes such as small irrigation schemes, integrated pest management programmes and pocket-package programmes.

This is despite the fact that all major plans and policies highlight the development of agriculture as a key sector for growth and development, including the National Agricultural Policy (2004), the National Agribusiness Promotion Policy (2006), the Trade Policy (2009), the Nepal Trade Integration Strategy (2010) and the Three-Year Plan (2011–2013).

BOX 3. DONOR-FUNDED AGRICULTURAL PROJECTS OVERLOOK THE POOREST FARMERS

A review of the implementation guidelines of ongoing major agriculture projects such as the Project for Agriculture Commercialization and Trade (PACT), the High Value Agriculture Project (HVAP) and the High Mountain Agribusiness and Livelihood Improvement Project (HIMALI) reveals that funds are directly disbursed to selected farmers' groups, co-operatives and private entrepreneurs or firms. The majority of small, poor and unorganised individual farmers have no access to the funding support provided by these projects. Most farmers do not even know about them.

Yet all these projects were funded by donors in order to improve poor farmers' food and livelihood security. If we analyse the direct beneficiaries of these projects, the majority of them are big farmers, the clans and relatives of the major political parties and their cadres, and private entrepreneurs and traders who can easily influence the selection criteria set by these projects.

[5] In Sub-Saharan Africa, heads of state have signed up to investing 10% of budget to agriculture (Maputo declaration) - several countries are already meeting that target.

Poorly implemented trade policies leave Nepal vulnerable to dumping

The lack of agricultural marketing and trade policies is another bottleneck for sustainable agricultural development in Nepal. Although Nepal is a member of the World Trade Organization (WTO), its agricultural trade policies have not been formulated as per WTO commitments. The government's existing agricultural policy contains a number of contradictions. For instance, the policy is not clear whether the government wants to invest for export promotion or import substitution. In the absence of clear policies, subsequent investments in agriculture have not produced the intended outputs. If we review the agricultural trade balance for the past 10 years, despite the high priority accorded to agricultural commodities with export potential, exports have been gradually declining and imports of primary agricultural commodities such as rice, oil, fresh fruit and vegetables, meat, milk, and milk products have been increasing. About 90 per cent Nepal's agricultural trade is with India and China. Due to open land borders and a separate bilateral trade treaty with India (the Trade and Transits treaty signed in 1996), agricultural trade between India and Nepal is duty free. Given the scale of the Indian economy and the government subsidies available to Indian farmers, Nepalese products are not competitive in the Indian markets. Thus, Nepal has been a net importer of agricultural produce since 1996. The government's agricultural trade policies neither support small producer farmers nor encourage domestic commercial farmers. The government has not been able to fully implement the terms and conditions of the treaty and Nepal has gradually becoming a dumping ground for cheap imports from India. Agricultural trade policies are generally formulated under the influence of traders, and the interests of small producers has not been given due consideration in the policy. The major political parties have not taken this issue seriously.

Farmers are the weakest link in local marketing

This study has reviewed the annual agricultural development programmes of the Ministry of Agricultural Development, particularly the Directorate of Agricultural Marketing Development. It is clear that in recent years considerable funds have been allocated annually towards developing marketing infrastructure in the major cities, district headquarters and rural-urban areas. The agricultural marketing centres are largely operated by big private players and hence small producer farmers have benefited less. The Kalimati Fresh Fruits and Vegetables Market (KFFCMDB) in Kathmandu is the major market in Nepal. It was established under the Development Board Act and operates under a public-private-co-operative partnership model. Interviews with the Executive Director of the KFFCMDB reveal that operation of the market is highly politicised. The decisions of the board are strongly influenced by the ruling party.

There are 11 members of the Board of Directors nominated according to the existing law. Theoretically, the majority of directors represent the private sector, with three traders and three producer farmers on the board, while the five government nominees are in the minority. However, in practice, the board is highly political since the three farmer representatives and five *ex officio* members are all nominated by the Minister of Agricultural Development. Only the three private-sector trader directors are nominated by their respective organisations (Union/Federation). The Member Secretary of the Board commented that most of the board members nominated as famer representatives are not real farmers. So the real issues faced by farmers are usually not addressed.

Whilst the traders are highly organised and directly represented on the board, individual farmers are not organised. Even where they are organised through vegetable groups/co-operatives, they are not represented by law on the board. The representation right of farmers is exercised by the minister. The directors representing the private sector have their own vested interests and have been highly influential in board decision-making processes.

There is a conflict of interest between the farmers and traders on the board, and the traders have a bigger say in its decisions, particularly the allocation of market stalls and fixing the monthly rents for space. Though the board has members representing both farmers (in theory) and government, the private sector members are more concerned with their own personal benefit, such as reducing stall rents, rather than how to manage and improve the market.

The average rental charge for a marketing stall is fixed for each fiscal year by the board. For 2013, it ranges from NR 23-24 per square foot to NR 70/sq.ft depending upon the location and aspects of the space. About 100 to 150 of the available stalls are allocated to individual producer farmers to sell produce on a daily rental basis. Individual sellers pay the board NR 100 per daily shift. About 9 per cent of stalls have been allocated to farmers' co-operatives, but so far the co-operatives have not been able to fill their quotas primarily due to their politicisation. Most of them are controlled by a few people. Despite having many members, only few of them are active and effective.

During the regular *Bandhs* (strikes), even the Kalimati Market is forced to shut down. This causes problems since the produce is perishable. During strikes, none of the food in the market may be taken out and fresh produce is not allowed to enter the market. In earlier

years, however, the vegetable and fruit traders were allowed to enter the markets even during strikes.

Market officials think that traders have been taking undue advantage of the free market policy and small producers are not benefiting from the market. Interactions with senior officials of the Department Agriculture and Ministry of Agriculture Development found that they are fully aware of the situation in Kalimati Market but the overall management and operation system has not been changed for years.

Incomplete devolution has caused confusion

The government has been implementing a decentralised planning process over the past decade. The Ministry of Agriculture has been gradually handing over the district level planning roles to the DADOs in each district. However, the planning process has not been fully decentralised and devolution has not been effective (see Section 3.2). Confusion between central and local government over the agricultural planning process at district level means that no-one has responsibility for the agriculture development programmes at district level. The DoA (see Section 2.4) has been playing a bridging role, however, between the DDC and the MOAD.

Interviews with officials from the DADO and DLSO found that district agricultural plans have not received due priority from either central government nor the DDC and the funds allocated to agriculture are inadequate. The block grant provided to DDC by the central government through MOAD is often limited and about 90 per cent of it is used for staff salaries and administration. Only 10 per cent remains for agriculture development programmes. The DDC wants to take over the agriculture sector but is often reluctant to allocate revenue generated at the local level. Under this situation it is high time for the government to decide either that agriculture should be completely decentralised, or else hold back the process.

Politicisation of the bureaucracy

The posting and transfer of staff is done on the basis of political favouritism and lobbying by trade unions affiliated to different political parties. Political leaders also lobby hard for funding for projects and initiatives in their constituencies and want to transfer or appoint project managers of their choice. This is a common feature of the bureaucracy in Nepal.

3.2 Actors: power imbalances and weak linkages

Agricultural actors' voices are weak

When it comes to resource allocation, particularly at district level, agriculture gets the lowest priority in the district development plan.

Under the decentralised planning process, farmers are involved in the preparation of the annual District Agriculture Plan through the district Agriculture Service Centres and sub-centres. The DADO organises one-day VDC-level planning workshops attended by 20-35 farmer representatives (usually the lead farmers or chairs of farmers' groups and members of co-operatives). The representatives are encouraged to present their demands in order of priority. The demands are collected from each VDC and put to an *Ilaka*[6]-level planning workshop for approval.

However, our interviews with ASC staff and farmers on the decentralised planning process at VDC level revealed that both the field technicians and farmers' leaders were of the opinion that agriculture receives the lowest priority from politicians and planners in the district.

Although there is provision for 15 per cent of total VDC grants to be spent on agriculture, in most of the VDCs this has not happened. Interviews with DADO and ASC staff in the field reveal that most the VDCs in Dhading District are not investing 15 per cent of VDC grants in the agriculture sector, for example. There has not been proper investment in important sectors such as improving irrigation and production. As a result, the annual investment in agriculture has not increased over the years in the district and depends solely on the block grant provided by MOAD through the DDC. The annual development budget for the agriculture and livestock sectors for district-level agriculture plans does not exceed 5 per cent of the administrative budget of the DADO and DLSO in the district.

The district planning process is highly politicised and only infrastructure development plans such as for constructing roads, schools, culverts/small bridges etc. get high priority in the district plan. Why is this?

According to our interviews:

- Farmers' networks and co-operatives have not been effective in influencing the planning process at district level.

[6] Ilaka: A political division of a district. Each district is sub-divided into 11 to 17 Ilakas depending up on population and physical areas of district.

- District planners do not know the existing farming situation as they have no reliable or up-to-date information sources.
- Farmers' groups and co-operatives have no representation on the DDC's subject matter committees. Agricultural commodity groups (e.g. for vegetables, fruit, rice, mushrooms and bee-keeping) have been established following the Ministry of Agricultural Development's guidelines, however, and co-operatives have been registered for the effective implementation of agriculture extension programmes, including the distribution of subsidies to farmers.
- The DADO expresses the view that although all VDC-level plans are collected and discussed by the relevant DDC committee, the representatives of political parties often ignore the agriculture plans submitted by the VDCs and divert the funds to infrastructure projects such as roads, drinking water, schools, and health posts. This is primarily due to the inadequate representation of farmers' organisations in the subject committee of DDC.
- Another reason could be that local elections have not been held for the past 16 years. The District Development Committee (DDC) is run by the Local Development Officer (LDO). However, the government has constituted a district development council made of members who include officers from district government line agencies such as the DADO, DLSO, Cottage and Small Industries Development, and the Women and Children Development Office and representatives from the major political parties active in the district. The representatives of political parties play a decisive role in finalising the district plan.

The private sector

The private sector (primarily middlemen) and Agro-vets (both as a company and profession) seeks to influence the district level planning process to increase their trade. They are particularly interested in benefit sharing and so encourage farmers to cultivate those crops which give them maximum benefit at particular times of the year.

Donor agencies have their own agendas

Donors have a high level of influence. They have their own interests and thus mould the projects they support according to their own requirements rather than those of the country. In some cases, donors meet directly with high-ranking officials such as the sectoral minister concerned to secure permission to launch projects without discussing their proposals with the relevant departments to discover the prevailing needs and situation. Donors' degrees of influence vary both between donors and between types of projects and programmes, however. It is reported that some of the bilateral donors are less transparent and most of the multilateral donors have a high degree of influence on the policies of the government. For instance, the World Bank/International Monetary Fund (IMF), the Asian Development Bank and the International Fund for Agricultural Development have had a strong influence on the national agricultural research and development policies and programmes formulated and implemented since 1990 in Nepal. The Agricultural Perspective Plan (1995-2015) is one example of how the national agricultural development policy was curtailed by the influence of donors who were advocating the withdrawal of agricultural subsidies, resulting in reduced investments, especially in subsidies for fertilisers, shallow tube wells and seeds.

Co-operatives and traders

Farm gate prices for most food commodities are very low compared with the prevailing consumer prices in the retail markets. This problem is unavoidable for several reasons. The food selling process involves various levels. Small-scale farmers usually cultivate 1-2 *Ropani* (0.1-0.2 hectares). This produces only a small volume of commodities so they can only achieve a limited income, although they always have high expectations of the financial benefit from their production. They sell their products to a middleman who organises transport to Kalimati Market in Kathmandu where they are a sold at the wholesale price (usually to businessmen, but sometimes to farmers). The businessmen then sell the food to consumers. By this stage, the price of food varies considerably. The real price makers of agricultural commodities are the urban traders, who control both the selling and buying prices for commodities in the market. However, there has been no analysis of how much the middlemen benefit as by the time the products reaches consumers, the price includes the costs of transportation and other factors.

Co-operatives are meant to carry out activities such as organising small producers, mobilising local resources through savings and credits to members, supplying critical inputs like seeds and fertilisers, developing micro and small irrigation facilities in the villages, and marketing farm produce at the local level. In most cases, a few lead farmers of the co-operatives tend to serve as middlemen for external buyers and are not interested in carrying out marketing themselves based on co-operative principles. Farmers are not fully aware of what co-operative marketing involves. They are advised by the co-operative managers and DADO staff to sell their produce through co-operatives to achieve better prices, but in fact all the co-operative offers is the physical infrastructure where external buyers come to buy at pre-negotiated prices. In many places, co-operative buildings are used for other purposes, including being

rented out to others, even though this is not allowed under co-operative rules.

Establishing collection centres for products in pivotal production pockets has reduced the traders' marketing costs significantly, but has not increased the prices paid compared with those paid to individual farmers selling similar produce in the areas. This is the main reason for the failure of co-operative-based marketing of agricultural commodities in Nepal. Individual producers, particularly small farmers, do not have any control over the existing marketing system although they have the choice either to sell their products at the buyer price through the co-operative premises, or to sell their products elsewhere. Therefore, it could be concluded that co-operatives have improved market access for their members, but not really helped to increase prices in the rural areas.

Initiatives are poorly co-ordinated

Co-ordination is difficult at departmental and district levels, where sectoral attitudes prevail and hamper work. One example is irrigation, where a lack of co-ordination between the DADOs and the district Irrigation Development Division (IDD) hampers agricultural intensification and commercialisation. Farmers require irrigation in April-May, when cultivation of the first paddy crop starts, but this is when irrigation canals are opened to flush out silt. Very few canals have water throughout the year, inhibiting irrigation when they are dry. Likewise, while there are DADOs in all 75 districts, some districts lack offices responsible for irrigation. One district irrigation office looks after four or five districts, making co-ordination difficult. There have been complaints about the lack of staff at the DOA to handle small irrigation schemes. Junior Technicians and Junior Technical Assistants are now trained and authorised to prepare estimates up to the amount of NRs 100,000 for small irrigation schemes.

In Dhading district there are a number of local and international NGOs (INGOs) working in various areas of agriculture. These include the United Mission to Nepal (UMN) and Plan Nepal. But there is no database of these NGOs (or those working in related sectors) and this inhibits formal collaboration. A review of donor-assisted irrigation development projects implemented in the past shows that some provided agricultural specialists but they were not required to co-ordinate with the relevant DADO while implementing the agricultural programmes in the irrigation command area.

Donors are not required to co-ordinate with the Ministry of Agricultural Development over the types of agricultural programmes and projects they are supporting NGOs to implement. Interviewees claimed that NGOs and INGOs do not share their data and only contact the Ministry of Agricultural Development when problems arise. The result of this lack of co-ordination is duplication of effort. For example the Director General of the Department of Agriculture claims that the Poverty Alleviation Fund (PAF) is doing similar work to the DOA and DLS.

Similarly, there are no financial joint ventures between NGOs and the DADO. The DADO and Agricultural Service Centres have no legal authority to co-ordinate and collaborate with them. However, some do so voluntarily, for example when they need technical support or people to provide training to farmers in specific issues.

There are several reasons for the lack of co-ordination. One may be personal interest – some officials are motivated and enthusiastic, while others are not, and this affects co-ordination. Others may be structural: for instance, although the Local Development Officer (LDO) and the Agriculture Development Officer (ADO) are at a similar level in the government hierarchy, decentralisation has given the LDO overall authority in the district and the ADO has to report to the LDO while undertaking DADO activities. This situation creates conflict among officials, affecting co-ordination at district level of both policy/planning and implementation.

Weak co-ordination is also a big problem at the national level. The Director Generals of all departments in the MOAD do meet every month to discuss pressing issues. However, co-ordination is undermined by hierarchal inconsistencies; lack of performance-based evaluation and incentives for staff; and lack of results-based monitoring and evaluation of programmes.

Many cross-ministerial committees have been formed at central and regional levels (including for agriculture), but they do not function effectively.[7] They focus mostly on administrative matters rather than addressing the pertinent technical problems faced by districts and farmers.

Even in implementing agricultural projects, the MOAD does not co-ordinate with the Department of Agriculture, regional directorates, or the central-level programme directorates. Most of the larger projects, such as the Project for Agriculture Commercialization and Trade (PACT), High Value Agriculture Project (HVAP), High Mountain Agribusiness and Livelihood Improvement Project (HIMALI), and the Rising Income of Small and Medium Farmers Project (RISMFP) are directly implemented by MOAD through separate project directors while smaller projects are implemented in

[7] For example, a number of ministries are working together to implement the National Trade Integration System implemented by the Ministry of Commerce and Supply. However, the Electricity Department, which is under the Ministry of Energy, never attends meetings. This makes it difficult to work effectively since agricultural development requires the Ministry of Agricultural Development, the Ministry of Irrigation, and the Ministry of Energy to work together.

the district by the Department of Agriculture through the DADO. This system is not effective primarily due to political instability coupled with a lack of financial resources and inadequate mid-level technical human resources in the agriculture sector.

This sectoral approach has been practised in Nepal for long time, and is an issue which is well recognised by all stakeholders. Integrated development approaches are gradually emerging at the department and district levels, primarily due to pressure by farmers' groups, co-operatives and their networks. These may help to solve the problem to some extent. MOAD claims that it is trying its best to co-ordinate with other line ministries and departments and with research organisations to implement its programmes.

3.3 Information and knowledge: weak links between evidence and policy

Planning and policy are not evidence-based

It is a general belief among the stakeholders interviewed during the study that in Nepal, agricultural policies, plans and strategies are formulated using only limited scientific knowledge, and are largely based on the experience of the people involved in the process. Decisions are influenced by high-ranking officials who are considered knowledgeable and experienced in the subject and who often do not realise the need to generate and use available knowledge. For example, comparative analysis of large agricultural projects like the HVAP, PACT and Agriculture Development Strategy shows that priorities were based on the judgement of the people engaged in the planning process and not backed with knowledge.

At the sectoral ministry and district level, the situation is even worse, and there is no system for documenting and using available knowledge. Our interviews with farmers, field staff working in government and the private sector indicated that most farmers and technicians are aware of the need to use available knowledge for effective local planning. This study shows that the majority of technicians working from central to field level neither possess adequate knowledge nor use available knowledge in their day-to-day work. These knowledge gaps are particularly evident in the areas of:

- soil fertility management (soil classifications/mapping, soil suitability maps, physical and chemical properties of soils etc.)
- crop husbandry based on prevailing agro-climatic conditions and traditional practices
- local, national and international agricultural market dynamics
- effects of climate change on agriculture and traditional knowledge on mitigation measures.

This section explores the factors behind these gaps between and evidence and decision making.

Who generates knowledge in Nepal?

Proper planning requires converting reliable data and information into knowledge. A number of government agencies and private sector organisations collect a wide range of information and data on agriculture. Several institutions are engaged in conducting research at different levels and generating knowledge in agriculture and related areas (Figure 5). These institutions are briefly described below:

Research institutes and universities

- **Agriculture and Forestry University (AFU**). AFU was recently established with a mandate to provide high-quality training in agriculture and forestry. It offers undergraduate and postgraduate research degree programmes in different discipline of agriculture, animal sciences, veterinary sciences, fisheries and forestry.
- **Tribhuvan University (TU).** TU is the one of Nepal's oldest universities. It has been conducting both undergraduate and postgraduate degree programmes in a wide range of subjects for many decades.
- **Nepal Academy for Science and Technology (NAST**). NAST also conducts some research in agriculture and related fields, sometimes in collaboration with other organisations and individuals engaged in agricultural research and development in Nepal.
- **Other regional universities.** Other universities such as Kathmandu University, Purbanchal University and Pokhara University conduct both undergraduate and postgraduate degree programmes in a wide range of disciplines including agriculture, forestry, environment and natural resources management, and generate considerable knowledge in the areas of their expertise.

Government institutions and departments

The Nepal Agricultural Research Council

The Nepal Agricultural Research Council (NARC) is an autonomous institute and the nodal agency for conducting research in agriculture in the country. Its overall objective is to uplift and support people's livelihoods through developing appropriate technologies

for agriculture, particularly for cereals, vegetables, pulses, fruits, livestock and fisheries.

With its headquarters in Kathmandu, NARC operates through 56 research divisions, national commodity programmes, and agricultural research stations spread over all five development regions and the three major agro-ecological regions of the country. NARC's services include: diagnosis (plant pathogens), soil analysis, entomology training for farmers and specialists, and the provision of leaflets and books.

There are five regional agricultural research stations (RARS) in the five development regions of Nepal, and 16 national crop commodity research programmes covering rice, wheat, maize, grain legumes, oil seeds, sugarcane, etc. However, there is no national programme for vegetables.

Each RARS conducts research programmes for crops, livestock and fisheries, and develops and tests suitable technologies in its region. Central research divisions, RARS and commodity agricultural research stations (ARS) also conduct outreach programmes (field testing of technologies) for crops, livestock and fisheries in the areas they cover. Most RARS/ARS have experts in vegetable cultivation and undertake experiments on suitable varieties and breeding.

Each year NARC organises a National Technical Working Group (NTWG) meeting which is also attended by policy makers. It also organises technical workshops at the regional level which are attended by Department of Agriculture officials and village-level workshops. NARC staff also attend workshops and village-level meetings organised by the DADOs.

Under its outreach programme, NARC provides crop varieties to farmers to test and select for their own use. NARC's focus is mainly on cereals (rice, wheat and maize). Hybrid varieties from India are imported and registered in Nepal, subject to approval by the varietal registration committee of Nepal.

However, although the NARC Act of 1990 clearly identified the Nepal Agricultural Research Council as the lead agricultural research organisation in the country, the national agricultural research system is still poorly co-ordinated. In most instances, NARC is unaware of research activities carried out by other research providers in Nepal.

National Agriculture Research and Development Fund (NARDF)

NARDF is an independent fund to encourage agricultural research and development agencies and organisations by providing grants on a competitive basis. The NARDF is headquartered in Kathmandu and implements its grant programmes at a national scale through a competitive bidding process. Grants are provided to successful bidders on the priority areas of research and development and the dissemination of knowledge and technology to farming communities across the country. NARDF provides funds to 20 to 50 organisations annually for a wide range of agricultural research and development projects. It also conducts monitoring and evaluation of its funded projects through independent consultants. In this way NARDF has been generating considerable knowledge on the effectiveness and efficiency of the funds provided to successful recipients.

MOAD

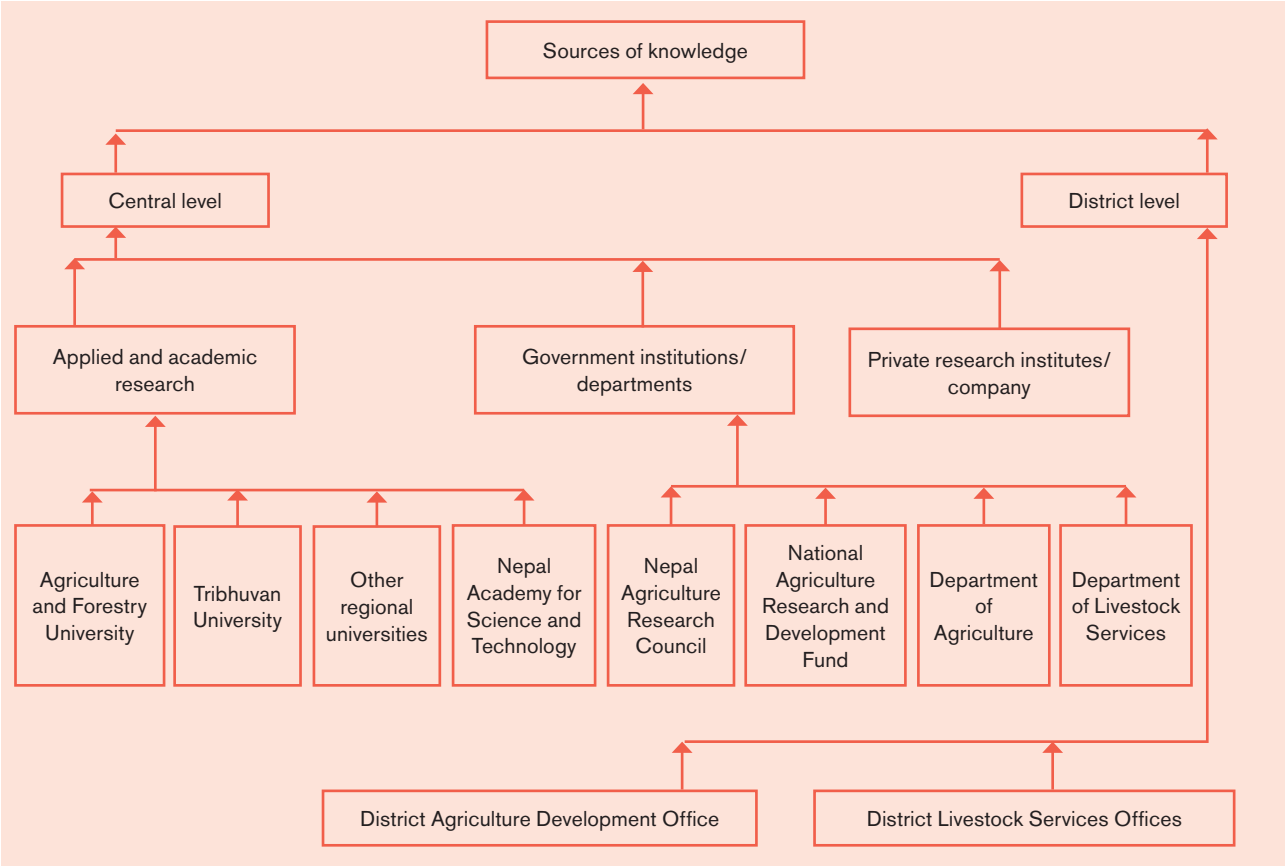
The Ministry of Agriculture Development is conducting food security monitoring in collaboration with World Food Programme (WFP), covering major aspects of food security/vulnerability in permanent food deficit districts of the country. It covers the annual production of major food crops, the food demand and supply situation, and prevailing market prices of major food crops. Based on the information collected from the food security monitoring, MOAD aims to update its existing policies and programmes to address food security for these districts.

Most of these institutions are vertically integrated into their respective hierarchies as shown in Figure 5, and there are also horizontal links with other stakeholders operating in the sector. Yet it is reported that most of the academic and research institutions lack the funding to undertake their research mandates and are confined to limited areas. Moreover, most of the research carried out by the faculty and students of the universities are not linked to practical problems and in most cases are not published or shared with the general public. There is no central authority for co-ordinating, collaborating and disseminating the knowledge generated by these institutions. As a result, research is often duplicated.

District level institutions

The DADO and the DLSO are the key government organisations acting as bridge between farmers and central government. Each organisation collects different data to send to the centre. The DADO and DLSO generally collect the basic agricultural information necessary for the formulation of district and national agricultural development plans. This includes information on crop area, crop production, and the supply and demand for inputs in the district. Most of the information is collected through Agriculture or Livestock Service Centres or sub-centres using structured formats developed and supplied by the respective central directorates. The information collected by the DADO and DLSO is forwarded to their respective directorates, but is rarely analysed in the district or used for district planning.

Figure 5. The agricultural knowledge system in Nepal



The Department of Livestock Services was established in 1976 with a mandate to provide extension services to farmers in livestock and poultry production. The department is also conducting some applied research, particularly on developing vaccines and other suitable technologies, verifying developed technologies on farmers' livestock and providing the necessary inputs for farmers to adopt improved livestock and poultry farming technologies. The department has several directorates which also conduct some applied research in their respective areas: livestock and poultry, pig production, producing and testing vaccines for animals and poultry, value chain development and marketing.

There is no defined procedure (sample size, coverage, frequency etc) for collection and analysis of data collected by DADO from the field. Each district collects information on different aspects of agriculture, depending on the initiative of individual officers in the district. It is observed that there is a wide variation in the nature and depth of information collected and analysed by the DADO.

In Dhading, inadequate financial and human resources mean that the information collected by DADO and DLSO does not represent the whole district. There are only six Agricultural or Livestock Service Centres and three contact service centres in the district, covering about 15 per cent of the area. As a result, the DADO does not have comprehensive knowledge about the existing situation throughout the district, and so the information collected is neither reliable nor adequate. This is why the district level planning process is effectively based on estimates by technicians and could be one reason why district-level planning has not been effective in the past.

According to our interviews with district stakeholders, no new approach is planned to improve the process at district level in the near future. There are plans, however, to increase the number of DADO field and management staff in district offices. The DOA has proposed increasing the staff of the Agricultural Service Centres to a total of 900 along with 1,400 field-level staff. The DOA has established a Planning Officer post in each DADO to collect, analyse and synthesise the basic information and data required for preparing district-level agriculture plans and update the database of major agricultural crops grown in the district.

There is no mechanism for sharing the information generated by the DADO/DLSO with other concerned departments, research agencies or institutes. Such sharing usually only happens when there are particular problems and the districts concerned are directed to do so.

There are five Regional Agriculture Directorates (one in each region) and several technical directorates in the centre, including the Agriculture Extension

Directorate, Agricultural Training Directorate, Agricultural Information and Communication Directorate, Agricultural Marketing Directorate, Plant Protection Directorate, Soils Testing Directorate, and the Seed Certification Directorate. Besides acting as a technical backstop to the DADOs and DLSOs, these central directorates also conduct applied research to solve farmers' problems and generate knowledge on respective fields of agriculture development, such as integrated pest management/animal diseases management, integrated soil nutrient management, crop varieties, animal breeds, marketing, and the adoption of new technologies by farmers. However, due to the lack of an established system and co-operation among these directorates, the knowledge generated and data collected by the different directorates are rarely processed. Even when they are processed, the information is not shared among the other directorates within the departments. Some of the directors of the directorates were of the view that co-ordination between the directorates is lacking and the knowledge and information generated by these directorates are neither updated nor used in the Department of Agriculture's planning process.

Data coverage and quality gaps

The Central Bureau of Statistics (CBS) conducts an agricultural census every 10 years covering several dimensions of agriculture of national importance. However, it does not collect data of local importance such as agricultural production, productivity, or the area under cultivation for key commodities.

Our research found that decision makers are largely dependent on the data generated by the CBS and presented in the MOAD statistical handbook. The latter focuses on production, yield, area, number of farmers, etc., and is updated every year by MOAD. By comparison, the CBS collects data at ten-year intervals. The agricultural census uses random sampling but does not cover all the dimensions of agriculture. For example, yield estimates are not reliable since total productivity is calculated from rather small samples (Box 4).

BOX 4. PRODUCTIVITY 'GUESTIMATES' IN DHADING

In Dhading the DADO has been conducting yield surveys of the major crops grown in the district in order to estimate production and productivity. Crop yield is estimated by cutting a sample plot of 10 square metres. Only two or three samples are taken per crop for each Agriculture Service Centre, however, which may not be adequate to extrapolate the yield for the whole district. There is no incentive for field staff to take enough samples to cover all the VDCs of the district.

The department's Soil Management Directorate produces soil maps showing suitability for agriculture. More than 40 districts have been covered to date, but inadequate funding has impeded the mapping process. Some mapping is supported by donors. Soil improvement programmes based on these soil maps are being launched. Problems with soil micro-nutrient deficiency are increasing due to intensive agriculture. If a farmer needs a soil test, it must be requested and it is subsidised. Decisions are generally based on information on agro-ecological conditions and crop potential. Decisions on programmes and monitoring are also based on climate data (used as and when needed, but not on a regular basis) and other variables like marketing information from the Marketing Directorate.

The Department of Agriculture has realised the need to upgrade the system using scientific tools and techniques. It is working on a geographic information system (GIS) in collaboration with the International Centre for Integrated Mountain Development (ICIMOD).

The DADO has been collecting some information, such as the use of agricultural technology, the productivity of major cereal crops in the district, and on the supply and demand for key agricultural commodities. This information is collected through informal interactions with a limited number of progressive farmers and farmers' groups or co-operatives, and so is not adequate for understanding overall conditions across the district (Box 5). Some of the wards are not easy to access, so they lack up-to-date data on the production of major crops, cropping intensity and changes in land use patterns. For effective local-level agricultural planning, such information needs to be updated at regular intervals.

BOX 5. INDIGENOUS KNOWLEDGE IS OVERLOOKED

Reviews of the available published works done by various universities, research institutions and independent researchers reveal that little work has been done on the knowledge of indigenous communities, and ethnic and tribal groups in Nepal. The conventional scientific community does not appear to give adequate importance to such local knowledge which has evolved to solve local problems and been tested for generations. Experience shows that such valuable knowledge and local practice are rapidly displaced by so-called scientific knowledge and practice.

Besides government line agencies, there are a number of NGOs and INGOs, community-based organisations (CBOs), farmers' groups and co-operatives generating considerable amounts of information and data on a wide range of agricultural research and development in Nepal. Most of these organisations have updated data on crop and livestock production, marketing, and the actual supply and demand situations of various services and products in their constituencies. However, government agencies often blame the INGOs/NGOs and other research agencies and individuals for not sharing their information for planning purposes. This was reinforced during our interviews with DADO and field staff in Dhading. There is no formal agency or mechanism to share the information collected, however, nor indeed is there any obligation on these agencies to do so.

In the past, the formulation of agricultural policies was based on export data which are not reliable due to the open border with India. Imported commodities are sometimes re-exported if the price differential makes it profitable for the exporters. For instance, the volume of exports of products such as lentils, Arica nuts, garlic and honey are much higher than the volumes produced domestically. Any trade policy based on such data is likely to fail in the long term.

What are the incentives for collecting information?

Our interviews with DADO staff revealed that motivation is very low, primarily due to lack of incentives for professionals, scientists and field staff to do creative and innovative work. For instance, field workers are neither encouraged nor allowed to carry out extra work if it is not mentioned in their annual work plan. Similarly, staff are generally not allowed to participate in workshops, seminars and other events organised by other agencies/institutions if it is not mentioned in the annual work plan of the respective district. Under such strict administrative rules, innovation in the system cannot be expected.

Resources, both financial and human, are insufficient (both financial and human) for collecting information on the types of crops grown, the area under major crops, the productivity of crops under various agro-ecological zones, and the management practices of different communities covering all 55,000 farming households in Dhading district. In most VDCs there is only one village secretary to perform all administrative, development, revenue collection and local level planning duties. In some cases, one secretary looks after more than one VDC in the district.

There are no formal established methods for collecting data on natural resources such as soils, water, agro-climatic data required for district agricultural planning. Therefore, any information is generally based on estimates by technicians and field staff and so may not be reliable.

Neither are there any formal established monitoring and evaluation system at the district level. Although senior officers monitor activities through the year, there are no monitoring documents. The outcome of such monitoring is not communicated properly and not recorded. The lack of documentation is mainly due to a lack of funding although some recording and monitoring reports are published by the DADO. Most of the departments, directorates, and district level organisations also publish annual reports which include an overview of the district programme. Some of the professional associations such as Agricultural Scientists of Nepal, Nepal Animal Sciences Association, Horticultural Societies and the Nepal Veterinary Association publish journals but there is no consistency in these publications.

The DADO does not have access to scientific knowledge and information on natural resources and therefore this information is not used for local-level planning and decision making. The pocket areas are declared based on visual observations by technicians, recommendations from local political parties and requests from farmers forwarded through their respective service centres in the district.

Information on the demand and supply of fresh vegetables

The Board of the Kalimati Market in Kathmandu has been collecting data on the daily transaction volumes of fresh fruit and vegetables and the wholesale prices of major commodities sold in the market. This market information has been fed to the relevant directorates of the Department of Agriculture and the Ministry of Agriculture Development on a regular basis. There are some structural deficiencies in the monitoring, however. There is no scientific method for monitoring the market using systematic tools and techniques. The daily wholesale prices of fruit and vegetables are collected from a few sample traders operating at market stalls and so may not be reliable.

Despite market data being regularly shared with MOAD, analysis of the ministry's annual agriculture development programmes does not show any correlation with the market information. The information collected by the Board is neither analysed nor used in preparing the annual MOAD agriculture development plan. No attempt has been made to reduce the gaps in demand and supply of fresh fruit and vegetables in the country. Despite the implementation of a number of agricultural projects and programmes for increasing production, annual imports of common vegetables (e.g. potatoes and onions), spices (e.g. ginger, garlic, coriander and chillies) and fruit (e.g. oranges, bananas, pineapples,

papaya and apples) have been increasing steadily over the past few years and prices have multiplied many times.

Interviews with Board officials reveal that the government does not have adequate information about the supply and demand of fresh fruit and vegetables. It is very difficult to distinguish whether produce sold in the market is imported or produced by farmers. Therefore, the Directorate of Agricultural Marketing should conduct a comprehensive market survey at frequent intervals to estimate the demand and supply situation of fresh fruit and vegetables in the market.

What are the incentives for generating knowledge?

The key problems related to agricultural research in Nepal include its weak responsiveness to farmers' and agro-enterprises' needs, eroding capacity, and limited funding. The issues are compounded by the limited number and capacity of agriculture research stations; weak co-ordination among education, research and extension services; inadequate participatory technology development with community-based resource centres; inadequate investment in agriculture research and capacity building; limited multi-stakeholder co-ordination and partnership; poor and poorly maintained research facilities, and a limited focus on commercial agriculture research.

Interviews with key informants at the ministry, departments, directorates and the Nepal Agricultural Research Council (NARC) revealed that some MOAD officers and NARC scientists are doing good work on their own initiative and developing new technologies in the agriculture, livestock and fisheries sectors. A number of young farmers have established links with individual officers and scientists to help them pursue the commercial production of vegetables, mushrooms, bee-keeping, poultry, dairy cattle and pork in a few pockets, but these individual efforts are not institutionalised and have not produced significant multiplier effects in the agriculture sector.

Cereal research dominates other sub-sectors in terms of technology generation, availability of human resources and investment in research projects. Only limited technology is available for horticulture, livestock, commercial crops and fisheries. Our field visits and interviews vividly indicated the dearth of technologies in commercial crops, livestock and horticulture crops. It will be essential for researchers to respond to the needs of processors and traders and develop demand-driven technologies to meet market needs in order to boost commercial production, increase income generation and improve the livelihoods of rural communities. A District Seed Coordination Committee (DSCC) has been formed with help from the International Maize and Wheat Improvement Center (CIMMYT) to promote the use of improved maize seeds in Dhading district. The DADO has been trying to expand the focus of the DSCC to the production and distribution of other cereal and vegetable seeds as well.

Underfunding and politicisation in NARC

NARC's capacity to conduct research has been seriously affected over the past several years by the withdrawal of external funding for research stations, outreach programmes and human resource development. This means that the high level of funding previously received at research centres such as Lumle and Pakribas cannot be sustained. At present, NARC is critically understaffed, with about 40 per cent of its scientific positions vacant due to recruitment problems. Most centres simply do not have the critical mass of scientists needed for multidisciplinary teams. NARC is weak in various disciplines including horticulture, livestock, and post-harvest technologies and agribusiness. It has recently recruited some scientific and technical staff to mitigate its understaffing problems, but the organisation has inadequate resources to attract and retain staff. The issue is not just salaries, but more importantly the lack of facilities and resources needed to carry out research.

Current NARC policy allows individual scientists to undertake their own research projects. Yet interactions with NARC scientists reveal that NARC's overall internal management system NARC not conducive for encouraging scientists to secure external funding. NARC levies a 25 per cent overhead charge on research grants raised by individual staff. Scientists and project leaders are neither encouraged nor given any direct incentive to proactively secure external funding to augment ongoing or new priority research programmes through collaboration with likeminded researchers and organisations. Management commonly controls the overall decision making on projects led by scientific staff.

This lack of incentives for scientific staff makes it difficult for NARC to retain qualified officers or recruit new staff. It is reported that young new university graduates are not interested in joining NARC and considerable numbers of scientist positions are lying vacant. The problem is further aggravated by a lack of human resource planning. In some divisions the number of scientists has fallen to a minimum level and the regular research programmes have been greatly affected. There is an urgent need to revise the existing human resource policy and incentive mechanism to attract and retain competent scientific and technical human resources.

Both technocrats and scientists working in MOAD and NARC are highly politicised. Recruitment, appointments, transfers and promotion are not based on individual merit but are influenced by political favouritism and nepotism. As a result, the ministry has neither been able to attract qualified officers nor retain the qualified and experienced experts and scientists already in the system. It is estimated that nearly 25 per cent of undergraduates and more than 50 per cent of the postgraduates produced in Nepal migrate to developed countries each year to pursue higher studies and better opportunities.

If sufficient corrective measures are not taken, NARC risks suffering a similar fate to that of the Agriculture Project Services Center (APROSC) – a government research organisation which was dissolved few years ago by the government.

How is knowledge disseminated?

There is considerable evidence that the public agricultural extension system in Nepal is not satisfactory. The Nepal Agricultural Research Council and its research stations have made only limited efforts to extend technology to the farming community. Interactions with NARC officials reveal that the annual budget allocated for such programmes is very low.

The district extension programmes are implemented through the farmers' groups and co-operatives formed in each district. Individual farmers can only receive verbal technical advice from the limited number of agricultural technicians deputed to the Agriculture Centres and Sub-centres in the district. Interviews with most of the vegetable farmers reveal that they rarely meet or receive advice from the public extension agents (Box 6). When

BOX 6. POOR INCENTIVES FOR VEGETABLE RESEARCH, DEVELOPMENT AND DISSEMINATION

Among the central level government organisations, the Vegetable Development Directorate is directly concerned with the intensification of vegetable production. The overall objective of the directorate is to provide technical support to farmers through extension services for improved horticultural production, processing and marketing technologies. The directorate operates nine government farms throughout the country. In addition, six farms are operated by the Fruit Development Directorate for the development and distribution of fruit seeds and seedlings. These farms focus mainly on producing foundation seeds and maintaining breeders' seeds for several vegetable crops and fruit trees. There is also a Central Vegetable Seed Production Centre at Khumaltar, but it has no direct links with either farmers or their organisations, or with DADOs. Co-ordination is on the basis of the personal interest of the farm manager and district officers concerned. Government farms provide foundation seeds at the request of the district.

There is no pricing policy for the seeds the farms produce, nor an explicit system for distributing seeds and other services to farmers and other interested organisations involved in horticulture production and marketing in the country.

However, some officers of the Central Vegetable Production Centre at Khumaltar have been using modern technology to provide free services through the Tele Agro Clinic. Officers provide services to interested vegetable farmers through their mobiles as well as a radio station in collaboration with an NGO. This was initiated by individual officers, and has not been institutionalised yet. There was no incentive to do this from the government. They are also conducting short-term training on improved vegetable production for farmers on a cost-sharing basis.

It is reported that demand for both seeds and training has been increasing every year. However, this has not been replicated on other government farms. There is no co-ordination mechanism between the government farms and either farmers or the DADO, meaning that the vegetable seed produced in the government farms is often not distributed. The annual targets of government farms are neither based on actual demand from farmers nor organisational capability. There is no commission for selling the seeds they produce so the government agencies often prefer to buy seeds from Agro-vet. Therefore, the innovative approach of the Central Vegetable Production Centre has not been appreciated by the high ranking officials of the Department of Agriculture and district agriculture development offices.

The study found that there is a very high demand for hybrid seeds and farmers are paying high prices for imported hybrid seeds produced and marketed by various multinational companies. The government has no policy for the development of hybrid seeds. So far, only one F1 hybrid (the tomato Srijana) has been released. In the absence of a practical policy on biotechnology in agriculture, qualified and experienced Nepali agriculturists and scientists have become frustrated and are leaving jobs in government.

they are available, they have hardly anything to offer which is relevant to their problems and constraints.

Dhading district has no ARS or NARC outreach programme. As a result, any problems are mainly dealt with by the respective NARC divisions. NARC does distribute seed and help farmers in the district when needed.

One positive aspect of the current devolution of the extension programme is that some DDCs have begun to allocate resources and revenues to the district extension service. The Ministry of Federal Affairs and Local Development has been supportive of such initiatives, instructing the Village Development Committees to allocate at least 15 per cent of their budget to the agricultural sector.

However, the incomplete and confusing decentralisation of extension, discussed above in Section 2.4, causes problems. Another problem is the low minimum educational qualifications for field-level technicians working in agriculture and livestock extension. The basic qualification for a Junior Technical Assistant (JTA) was fixed about 60 years ago when it was very difficult to find SLC graduates in Nepal. Today Nepal is producing about 500 agriculture, veterinary science and food technology graduates, but half of them are reported to be migrating abroad.

Some NGOs and co-operatives do provide good extension services for farmers but they do not have long-term financial resources to continue their service. The DDC and DADO/DLSO should identify and select such organisations operating in the VDCs to work as designated servics providers for agriculture or livestock, or both, on a cost-sharing basis.

NARC's published research results are often disseminated to the public through various channels (e.g. scientific papers, progress reports, and electronic material published by the Information, Communications and Documentation Division). Individual scientists are not allowed to share research results or data with individuals or organisations unless it has been officially published in either a national or international journal. There is no defined system of incentives for NARC scientists to disseminate knowledge.

Conclusions, reflections and next steps

4

The sustainable intensification of agriculture in Nepal would improve the productivity of both land and labour. Improved agricultural productivity requires the adoption of appropriate technologies and know-how to increase the efficiency and sustainability of agricultural production consistent with market demand. Measures to raise agricultural productivity include: i) effective agricultural research and extension services; ii) efficient use of agricultural inputs; iii) efficient and sustainable practices and use of natural resources (land, water, soils); and iv) increased resilience to climate change and disasters.

In the absence of reliable and accurate updated data on land-use patterns, irrigation status and the use of improved farming technology such as improved seeds, fertilisers, pesticides and machinery, MOAD's overall planning process has not been effective. These programmes are designed and implemented from the centre without being based on the actual needs and demands of farmers. Moreover, there is no continuity in such programmes. For instance, the government has introduced many commodity development programmes, run them for a few years and then phased them out without conducting any independent evaluation. After a few years, similar types of programmes are reintroduced under different names.

The Ministry of Agricultural Development is moving towards adopting a participatory decentralised agricultural policy, mobilising key stakeholders at national, district and local levels. The active involvement of a wide range of stakeholders in the preparation of the recent Agriculture Development Strategy is evidence of this. However, the fact that the planning process has not been fully decentralised means that there is confusion within the agriculture sector over whether it will be implemented or not in the future.

The current uncertainty over the future constitution of the country has severely impeded policy making, programme planning and implementation of agricultural research and development programmes in general and the devolution of the agricultural extension programme in particular.

The low productivity of the agriculture sector is due to a number of other factors, including a lack of adequate incentives for producers and a lack of suitable technology and of essential production inputs, particularly seeds, fertiliser, irrigation, and extension services and marketing. Ecologically, Nepal is considered to be well suited for the production of many agricultural commodities and could have a competitive edge in both domestic and regional markets, but the following policy changes will be needed.

Ensure the participation of stakeholders in the planning process

Many of the existing agricultural programmes have been formulated by central government, often assisted by donors, but without involving farmers. Experience in the past has been that most of the agricultural policies, plans and strategies implemented were not successful due to the lack of meaningful participation of farmers and other key stakeholders. The effective participation of farmers' organisations while formulating agriculture plans, policies and strategies should help ensure they feel a sense of ownership. The role of farmers is also important. Farmers first need to identify what they need and be able to request it so that appropriate programmes can be developed.

It is strongly recommended that agricultural policies, plans and projects be based on local needs and ensure the meaningful participation of civil society, including farmers' groups, co-operatives, agro-vets, NGOs and the private sector. MOAD should revise its policy formulation process to establish a system which engages all relevant stakeholders from the grass-roots level upwards. The government sector, however, has a key role in co-ordinating the efforts of these other actors, facilitating the implementation of policies and plans, monitoring performance, and enforcing regulations.

Enhance the capacity of public institutions

Investment in agriculture is very low and needs to be increased. The government does not have consistent, relevant or updated policies in agriculture, largely due to the country's prolonged political transition. There are also gaps between the periodic plans, policies, strategies and implementation because of: i) weak co-ordination among stakeholders; ii) poor monitoring systems and lack of mechanisms for timely adjustments to the plan; iii) limited awareness and dissemination of the plans; iv) weak capacity in policy analysis and monitoring, and weak understanding of the regional and global policy context; v) inadequate resources to implement the plans; and vi) lack of harmonisation of policies, protocols and regulatory frameworks between national and international agencies.

The majority of the service providers, farmers, entrepreneurs, co-operatives, farmer and trade organisations and financial institutions also do not have adequate capacity to discharge the expected proactive roles in their respective fields. Therefore, capacity development and human resource development in the agriculture sector are important cross-cutting issues for the generation of relevant knowledge and the development of skills in the formulation, implementation, monitoring and evaluation of consistent policies, plans and strategies in agriculture sector. The existing

agricultural education system is not integrated with the national human resource needs of the agriculture sector, nor is it linked to the extension services. The existing conventional agricultural education policies and programmes should be revised to ensure closer integration with research and extension, improved capacity within universities, agricultural colleges and vocational schools, and better responsiveness to the needs of farmers and agro-enterprises.

Any new projects in agriculture should focus on strengthening the existing structure of the Ministry of Agriculture Development, along with the Department of Agriculture, Regional Directorates and District Agriculture Development Offices, rather than creating new projects implementing separate structures at different levels.

Ensure the supply of basic productive inputs for poor farmers

The majority of small-scale and poor farmers in Nepal have no access to subsidised inputs such as seeds, fertiliser, machinery and equipment, and loans. Annual programmes have made limited provision for such subsidies but they have never been institutionalised. In recent years, a number of projects have been implemented by government to improve farmers' access to these inputs but the implementation guidelines of these projects clearly show that it is the bigger farmers and private entrepreneurs who have benefitted the most. Provision for basic inputs should be made in the government's annual agricultural development programmes and should be made available to all small-scale and poor farmers across the country.

Increase the participatory and pro-poor focus of donor-funded programmes

One key challenge facing the agriculture sector is the lack of co-ordination among the government, the private sector and donors. Donor-funded programmes in recent years are not addressing the real challenges of farming communities to improve productivity and quality and to develop value chains for potential agricultural and livestock commodities. Donor-supported programmes and projects have involved very little participation by small-scale farmers and disadvantaged community groups. The main beneficiaries of the donor-supported projects are usually the members of the major political parties, middlemen and a few established traders and agro-processors.

Link research, education and extension agencies

The existing NARC structure and research programmes lack any focus on developing demand-driven site-specific agricultural technology for small farmers in remote rural areas. NARC should be restructured with a focus on decentralisation and increasing its responsiveness to the research needs of farmers and agro-enterprises, while fostering links within the research-education-extension triangle. Rather than increasing the human resources in the public sector, the capacity of existing government resources need to be transformed to take on a new role as overall facilitators of agricultural research, development and extension, rather than delivering services directly. This change in role of the government sector should be accompanied by a greater emphasis on the delivery of services by trained local service providers.

Despite institutional mechanisms for collaboration and co-ordination among the different agencies involved in research, education and extension services such collaboration has been the biggest challenge for the functional integration of research-education-extension services in Nepal. One of the reasons could be that these institutions lack shared responsibility for the development and dissemination of new technology and the development of the human resources required in the agriculture sector. The problem is further aggravated with the rise of the private sector in the areas of research, education and extension. The public-private partnership (PPP) model, which has been initiated in other sectors, should be extended to the field of agricultural research, education and extension on a cost-sharing basis. The government should play a proactive role in initiating this model for developing new site-specific agricultural technologies, and disseminating suitable technologies in a cost-effective manner involving quality human resources. Specific steps include the following:

- Restructure NARC to cater for the growing needs of the country.
- Revise NARC's human resource policy to attract a new generation into research, and the government should upgrade the minimum educational qualification for extension workers to Bachelor's level so that considerable numbers of new graduates could be employed in the government system as well as improving the quality of extension services to farmers.
- Increase investment in research to levels at least on a par with the rest of the region, i.e. about 1 per cent of agricultural gross domestic product.

- Decentralise research programmes, including allocating at least 50 per cent of NARC's research budget to participatory outreach research programmes.
- Promote collaborative research and education programmes with universities and agricultural colleges.
- MOAD should restructure the existing extension system with organisational innovations, developing mechanisms for wider collaboration with existing private service providers such as NGOs/CBOs, co-operatives, Agro-vets and Local Resource Persons in the communities in order to catering for the growing needs of farmers at local level.

Identify commodities with potential for intensification

An analysis of the area under different crops, annual production, productivity and the trade balance of major agricultural commodities shows that there is a wide gap between the potential yield and the national supply of these commodities. This clearly indicates that more needs to be done to increase agricultural production. The low productivity of the agriculture sector is due to a number of factors including a lack of adequate incentives for the producers, coupled with a lack of suitable technology and of essential production inputs, particularly seeds, fertiliser, irrigation, and extension services and marketing. Ecologically, Nepal is considered to be well suited for the production of many agricultural commodities and could have a competitive edge in both domestic and regional markets. Unfortunately, we have not been able to identify the commodities with a high potential in the export market. Commodities are produced and brought to market based on what local farmers are familiar with, rather than their suitability for the area, climate, soils etc. Therefore, there is an urgent need to identify and prioritise those commodities with the potential for real competitiveness in the export market so that both farmers and entrepreneurs could make investments confidently. A few commodities have already been identified such as tea, organic coffee, honey, ginger and apples, but we have not estimated the potential volume of production if improved technology were used. Before encouraging farmers to invest in these commodities, participatory mapping of the area should take place.

Identify potential production pockets for priority commodities

A number of package-pocket programmes covering almost all agricultural commodities are being implemented across the country. Interactions with the officials concerned in both the district and central departments reveals that most of these pocket areas have been selected based on what is being done by the farmers and access to service providers in the district, rather than on the suitability of the areas based on climate, soils etc. These pockets areas should be identified based on the technical suitability of the areas for producing those commodities rather than administrative ease.

Strengthen the information collection and processing system

Information collected in the district is rarely analysed in the district nor used in the planning process. There are discrepancies between the collected information and the actual situation in the field. The MOAD should revitalise its data collection system in all sub-sectors, mobilising its existing institutional structure and system. In order to make the district planning process more effective, the DLSO and DADO should:

1. Update and revise their spatial data on the availability of and access to irrigation facilities to assess the potential for agricultural intensification in the district.
2. Create reliable databases of land-use patterns, use of improved seeds or breeds, and the productivity of the major crops/livestock/poultry in the district.
3. Keep an up-to-date database of private service providers, including NGOs/CBOs, co-operatives, agro-vets and individual local resource persons in the district.
4. Establish a meteorological station at each ASC/LSC to collect data on rainfall, temperature, sunshine hours and wind velocity year round.
5. Ensure adequate resources and incentives to field-level staff to improve the accuracy of data collected from the field.

References

CBS. (2012). *National Population and Housing Census 2011 (National Report).* Kathmandu: Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics.

DADO. (2011). *Annual Report.* Dhading: District Agriculture Development Office.

DADO. (2012). *Annual Agriculture Development Program and Statistics Book - an Overview.* Dhading: District Agriculture Development Office (DADO), Ministry of Agiruclutural Development, Government of Nepal.

DDC. (2010). *District Development Committee Dhading*. Retrieved 2013, from District Development Committee Dhading, Brochure: http://www.ddcdhading.gov.np/alluploads/Brochur%20in%20English%20067.pdf

DDC. (2012). *Dhading Development Suggestion.* Dhading: Information and Documentation Center, District Development Committee.

DDO. (2012). Introduction to Dhading District. Dhading, Nepal: District Development Office: Information and Documentation Center.

GEC. (2002). *Preparation of Soil Mapping of Dhading District.* Kathmandu: Gaurav Engineering Consultant.

Intensive Study and Research Center. (2008). *Village Development Committee Profile of Nepal (A Socio-economic Development Database of Nepal).* Kathmandu: Intensive Study and Research Center.

ITECO, FIDA, North Star JV. (2012). *District Transport Master Plan: Dhading.* Kathmandu: Ministry of Local Development.

Ministry of Federal Affairs and Local Development (MoFALD. (2013). *GIS Map of 75 districts (Landuse, Admin Boundary, River and Road)*. Retrieved April 2013, from Ministry of Federal Affairs and Local Development Website: http://mofald.gov.np/mld/eng/districtmap/30Dhading/03_Landuse.jpg

MOAC. (2009). *Statistical information on Nepalese Agriculture 2008/2009.* Kathmandu: Agri-Business Promotion and Statistics Division, Ministry of Agriculture and Cooperatives.

MoAC. (2012). *Statistical Information on Nepalese Agriculture 2011/2012.* Kathmandu: Agri-Business Promotion and Statistics Division, Ministry of Agriculture and Cooperatives.

MOAD. (2009). *Statistical Information on Nepalese Agriculture 2008/2009.* Kathmandu: Government of Nepal, Agri-Business Promotion and Statistics Division, Ministry of Agricultural Development,.

MOAD. (2013). *Agricultural Development Strategy.* Kathmandu: Government of Nepal, Ministry of Agricultural Development.

MOLD. (2012). *District Transport Master Plan: Dhading.* Kathmandu: Government of Nepal, Ministry of Local Development.

NPC. (2007). *Three Year Interim Plan.* Kathmandu: National Planning Commission, Government of Nepal.

NRB. (2013). *Macroeconomic indicators of Nepal.* Kathmandu: Nepal Rastra Bank (NRB), Research Department.

Teacher Educator's Society-Nepal. (2005). *Situation Analysis of SOP and FSP in Dhading and Siraha Districts.* Sanothimi, Bhaktapur: JICA/CASP Office.

Related reading

Edmond Kaboré et Serge Alfred Sédogo. 2014. Economie politique autour des grands barrages: Le cas du barrage de Bagré, Burkina Faso. IIED Rapport pays. IIED, London http://pubs.iied.org/14642IIED.html

Reducing Deforestation and Forest Degradation in Nepal: A Strategic Environmental and Social Assessment of Nepal's REDD+ Strategy http://pubs.iied.org/G03821.html

Reducing Deforestation and Forest Degradation in Nepal: An Environmental and Social Management Framework http://pubs.iied.org/G03822.html

The monitoring and evaluation of climate change adaptation in Nepal: a review of national systems http://pubs.iied.org/10064IIED.html

Safeguarding the future, securing Shangri-La - Integrating environment and development in Nepal http://pubs.iied.org/17512IIED.html

Planning and costing of agricultural adaptation in the integrated hill farming systems of Nepal http://pubs.iied.org/G03171.html

Annex I. Vegetable production in Nepal: some statistics

Table A1 shows the area, production and productivity of various vegetables in Nepal over the last seven years. The trend shows that both area and production have been increasing gradually but the overall productivity of vegetables has remained almost constant. This also implies that the overall impact on vegetable production of the research and development programmes of both the government and other agencies has been minimal. Whatever growth in production has been observed was brought about by market forces: the demand for fresh vegetables has been increasing and farmers have been producing vegetables on their own.

Table A2 shows the average wholesale prices for selected fresh vegetables in the month of August 2013.

The government does not have suitable policy and programmes for import substitution of vegetables. Reviews of the DOA annual development plan and programmes does not show any target program for increasing vegetable production except some provision for distribution of few sprayers, mini-kits to farmers.

Table A1 Vegetables in Nepal: area cultivated and production

YEAR	AREA (HA)	PROD (MTON)	PRODUCTIVITY (TON/HA)
2005/06	189,832	2,190,100	11.54
2006/07	191,922	2,298,689	11.98
2007/08	208,108	2,538,904	12.20
2008/09	225,154	2,754,406	12.23
2011/12	6,041,000	7,406,300	12.26

Source: Agri-Business Promotion and Statistics Division, Ministry of Agriculture and Co-operatives

Table A2 Average wholesale prices for vegetables at Kalimati market

SN	VEGETABLES	UNIT	PRICE (NR/KG)	PREVIOUS WEEK'S PRICE (NR/KG)
1	Large Tomato	Kg	60	32
2	Onion	Kg	90	60
3	Ginger	Kg	160	140
4	Potato (Red)	Kg	30	26
5	Potato (White)	Kg	29	22
6	Snake Gourd	Kg	33	27
7	Ghiraula	Kg	27	40
8	Pumpkin/Squash	Kg	30	25
9	Green onion	kg	60	45
10	Kurilo	Kg	190	150
11	Bamboo shoots	Kg	65	55
12	Green Chillies	Kg	60	35
13	Green Garlic	Kg	58	35
14	Green Coriander	Kg	145	125
15	Cabbage	Kg	30	25

Table A3. Area, production & yield of different fresh vegetable crops, 2011/12

VEGETABLES	AREA (HA)	PRODUCTION (METRIC TON)	YIELD (METRIC TON/HA)
Cauliflower	495	7054	14
Cabbage	563	8220	15
Broccoli	30	225	8
Tomato	760	13528	18
Radish	277	3933	14
Broad mustard leaf	510	3264	6
Carrot	30	336	11
Capsicum	145	1044	7
Peas	76	76	76
French beans	35	284	8
French beans – pole type	267	2203	8
French beans – sword type	35	355	10
Broad beans	30	270	9
Asparagus beans	79	711	9
Cowpea	23	186	8
Asparagus	5	30	6
Chilli akabare	10	72	7
Chilli	194	194	1
Okra	170	1484	9
Brinjal	256	2944	12
Onion	172	1780	10
Cucumber	423	6134	15
Pumpkin	87	1331	15
Squash	83	955	12
Bitter gourd	264	3126	12
Sponge gourd	212	2703	13
Snake gourd	78	749	10
Bottle gourd	346	5951	17
Chayote	15	330	22
Coriander leaf	35	217	6
Spinach	45	239	5
Cress	45	234	5
Colocasia	120	1860	16
Yam	34	1020	30
Other (veg.)	92	1021	11

Source: (MOAD, 2012)

Annex II Reflections on the process

What have we learnt from using the diagnostic?

The diagnostic could be useful if used properly. Some of the questions in the checklists developed for this study were not relevant to all respondents at different levels. We found that most of the information needed for the IIED diagnostic could be collected through secondary sources provided sufficient time was available for identifying the sources available, and collecting the relevant information before going into the field. This would have helped researchers gain considerable knowledge about the key issues the diagnostic intended to analyse.

What could be done better / differently?

The checklist/questionnaires should be simplified and made shorter where possible, to capture only the key issues relevant to particular types of respondent. Researchers should try to interview more than one respondent from each organisation so as to cross-check or verify the responses obtained.

The checklists/questionnaires should be revised based on the examples of revised targeted checklists developed for this study.

Reflections on the case study

It was very difficult to secure interviews with high-level people in the organisations contacted during the study. Private-sector people were more reluctant to express their views with researchers than officials from government research and development agencies. Farmers and their representatives were very co-operative and participated actively in the discussions. They provided valuable information to the researchers in the field. At the central level, however, most of the representatives of farmers and their networks or co-operatives are highly politicised and not concerned with the problems of farmers themselves. They are thus not engaged directly in solving the farmers' problems.

Acronyms

ADB	Asian Development Bank
ADS	Agricultural Development Strategy
AEMS	Asian Centre for Environment Management and Sustainable Development
AFU	Agriculture and Forestry University
AGDP	Agricultural gross domestic product
APP	Agricultural Perspective Plan
ARS	Agricultural research station
ASC	Agriculture Service Centre
ASP	Agriculture Service Contact Point
CBS	Central Bureau of Statistics
CIMMYT	International Maize and Wheat Improvement Center
CPA	Comprehensive Peace Agreement
DADO	District Agriculture Development Office
DC	District Council
DDC	District Development Committee
DFID	Department for International Development (UK)
DLSO	District Livestock Services Office
DOA	Department of Agriculture
EC	Electoral constituency
EVDC	Exemplary Village Development Committee
GIS	Geographical information system
HIMALI	High Mountain Agribusiness and Livelihood Improvement Project
HVAP	High Value Agriculture Project
ICIMOD	International Centre for Integrated Mountain Development
IDD	Irrigation Development Division
IIED	International Institute for Environment and Development
INGO	International non-governmental organisation
KFFVMDB	Kathmandu Fresh Fruits and Vegetables Market Development Board
LDO	Local Development Officer
LRP	Local Resource Person
LSC	Livestock Service Centre
LSGA	Local Self Governance Act
MOAD	Ministry of Agricultural Development
MOFALD	Ministry of Federal Affairs and Local Development
NARC	National Agricultural Research Council

NARDF	National Agriculture Research and Development Fund
NAST	Nepal Academy for Science and Technology
NGO	Non-governmental organisation
NPC	National Planning Commission
NR	Nepali Rupee (US$1= NRs 90)
NTWG	National Technical Working Group
ODI	Overseas Development Institute
PACT	Project for Agriculture Commercialization and Trad
PAF	Poverty Alleviation Fund
RARS	Regional Agricultural Research Stations
RISMFP	Rising Income of Small and Medium Farmers Project
TDC	Town Development Committee
TYP	Three-Year Plan
UNM	United Mission to Nepal
USAID	United States Agency for International Development
VDC	Village Development Committee
WFP	World Food Programme
WTO	World Trade Organization

Agricultural intensification is happening in sub-urban Kathmandu, with districts such as Dhading developing market gardening to cater for the ever growing needs of the growing city. But intensification can also impact negatively on the environment, unless accompanied by appropriate agricultural and environmental policies and services. This study explores the drivers for agricultural policies and practices in Dhading, using a political economy framework that emphasises the role of knowledge in decision making.

IIED is a policy and action research organisation. We promote sustainable development to improve livelihoods and protect the environments on which these livelihoods are built. We specialise in linking local priorities to global challenges. IIED is based in London and works in Africa, Asia, Latin America, the Middle East and the Pacific, with some of the world's most vulnerable people. We work with them to strengthen their voice in the decision-making arenas that affect them – from village councils to international conventions.

iied

International Institute for Environment and Development
80-86 Gray's Inn Road, London WC1X 8NH, UK
Tel: +44 (0)20 3463 7399
Fax: +44 (0)20 3514 9055
email: info@iied.org
www.iied.org

Knowledge Products

UKaid
from the British people

This research was funded by UK aid from the UK Government, however the views expressed do not necessarily reflect the views of the UK Government.