FARMING SYSTEM FOR NUTRITION:

NEED AND SCOPE IN BIHAR

R. Rukmani

G. Anuradha

R. Gopinath

Samyuktha Kannan

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CONTENTS

Abbreviations

APMC	Agriculture Produce Marketing Committee
ATMA	Agriculture Technology Management Agency
BCC	Behaviour Change Communication
DFID	Department for International Development (UK Govt.)
DRWA	Directorate of Research on Women in Agriculture
ECCE	Early childhood care and education
FPO	Farmer Producer Organization
GDP	Gross Domestic Product
GP	Gram Panchayat
IFS	Integrated Farming Systems
ICAR	Indian Council of Agricultural Research
ICDS	Integrated Child Development Services
ICT	Information and Communication Technology
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IMR	Infant Mortality Rate
INM	Integrated Nutrient Management
IPM	Integrated Pest Management
IWMP	Integrated Watershed Management Program
IYCF	Infant and Young Child Feeding
KVK	Krishi Vigyan Kendra
LAMPS	Large Area Multipurpose Cooperative Societies
MMR	Maternal Mortality Rate
MoU	Memorandum of Understanding
MSSRF	M. S. Swaminathan Research Foundation
NFSM	National Food Security Mission
NMAET	National Mission for Agriculture Extension and Technology
NMSA	National Mission for Sustainable Agriculture
NREGA	National Rural Employment Guarantee Act, 2005
NGO	Non-governmental Organization
PACS	Primary Agricultural Credit Societies
PPP	Public private partnership
RIDF	Rural Infrastructure Development Fund
RMC	Regulated Market Committee
RKVY	Rashtriya Krishi Vikas Yojana
SC	Scheduled Caste
ST	Scheduled Tribe
WCD	Women and Child Development
WHA	World Health Assembly

Acknowledgements

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R. Rukmani
Director, Food Security

Section1:

INTRODUCTION

One of the major issues concerning India is the persistent problem of malnutrition, particularly among children and women. Over the several decades of planned development, many different programmes and schemes have been put in place to tackle the problem of malnutrition across different age groups of population, and focusing on infancy, childhood, adolescence and women in their reproductive years. In spite of various efforts, including rapid advances made in food production, malnutrition persists in India at unacceptable levels. Stunting, wasting and underweight among children and anaemia and chronic energy deficiency among women remain key public health challenges in India. The prevalence of malnutrition in India has accompanied a reduction in diversity of food crop production over the years. There has been a tendency towards cereal-dominant farming systems of rice and wheat, with a decline in production of a variety of millets and pulses over time, in the country.

Malnutrition is caused by multiple factors and any approach to tackle the problem of malnutrition would require a holistic, multidimensional approach. A combination of nutrition specific interventions and nutrition sensitive interventions is required to address malnutrition[1]. The United Nations Children's Fund's (UNICEF) conceptual framework identifies household food insecurity as one of the underlying causes of malnutrition (UNICEF, 2017). For much of India's rural population dependent on agriculture and allied activities, household food security and nutrition is closely linked to farm diversity, productivity and profitability.

M. S. Swaminathan Research Foundation (MSSRF) promotes the Farming System for Nutrition (FSN) as a pathway for addressing malnutrition in India. The FSN approach is defined by M. S. Swaminathan as:

> ***"The introduction of agricultural remedies to the nutritional maladies prevailing in an area through mainstreaming nutritional criteria in the selection of the components of a farming system involving crops, farm animals and wherever feasible, fish".*** (Nagarajan et. al 2014)

[1] Nutrition-specific interventions address the immediate causes of undernutrition, like inadequate dietary intake and some of the underlying causes like feeding practices and access to food. Nutrition-sensitive interventions address some of the underlying and basic causes of malnutrition by incorporating nutrition goals and actions from a wide range of sectors such as agriculture, education and social welfare UNICEF (2017).

The FSN approach comprises a combination of measures including advanced crop production practices, biofortification[2], promotion of kitchen gardens of fruits and vegetables, livestock and poultry development, and setting up of small-scale fisheries, combined with nutrition awareness. Primarily, the approach calls for the promotion of location-specific farming systems that integrate arable farming, horticulture, backyard farming and animal farming to sustainably improve household availability of nutrition while also mitigating risk and conserving natural resources. In developing a design for the farming system, feasible agricultural interventions to address the nutritional deficiencies of the household/community/location would have to be incorporated. In the words of M. S. Swaminathan, ".....the design of the farming system [can] include specific crop varieties that can address the identified deficiencies. Sweet potato might provide vitamin A, drumstick tree (*moringa olifera*) and *Amaranthussp.* could address the lack of iron." (Rao and Swaminathan, 2017) In addition, the approach recognises the need for other direct interventions – to improve production and market linkages of nutritious crops- and indirect interventions – to improve women's empowerment, nutrition, education, drinking water, sanitation and natural resource management, along the pathway from agriculture to nutrition (Das et al, 2014; Gillespie and Kadiyala, 2012; Shetty, 2015).

In the Indian context where malnutrition levels are closely linked to inadequacy in food intake as well as lack of balanced diet among the rural population, the FSN approach that promotes on-farm production diversity has the potential to enhance consumption diversity. However, given the magnitude of the problem of malnutrition, the FSN approach has to become a state initiative to contribute towards enhancing food security and nutrition for large sections of the population. There is thus a pressing need to reorient agricultural policies towards achieving nutritional goals. Agricultural policies can affect nutrition through different pathways, such as through food production, or agricultural income or women's empowerment. Agricultural policymaking across the different domains should become more nutrition-sensitive and aim to unite the twin goals of agricultural growth and nutritional improvements (Gillespie& Kadiyala, 2012).

[2] Biofortification is a process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding or modern biotechnology (WHO, 2016).

The Farming System for Nutrition approach can be seen as encompassing 8 distinct domains. At its core, the approach calls for improving agricultural production diversity by incorporating an integrated farming system involving crops, livestock and aquaculture in the field or in the homestead. Other core domains that can directly improve the local availability of deficient nutrients include agricultural production, biofortification and agricultural value chains. Indirect or non-core domains that supplement the food related processes, include nutrition-education, women's empowerment, sanitation, hygiene and safe drinking water and natural resource management (Fig 1.1).

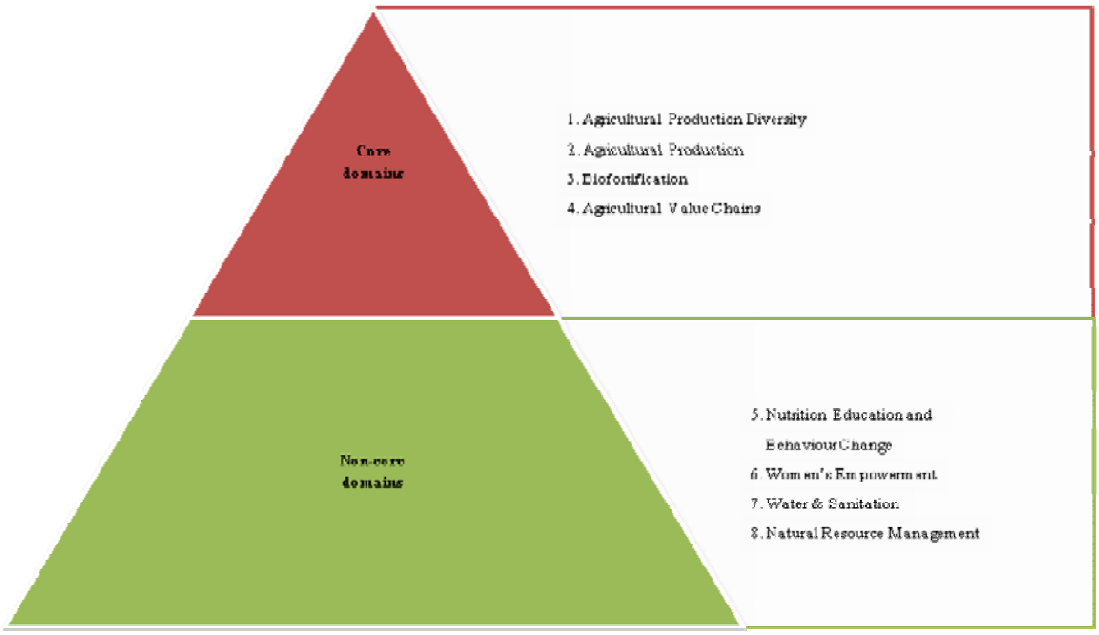


Fig 1.1. Domains of *Farming System for Nutrition*

MSSRF has been engaged in advocacy for a FSN approach in four selected states-Andhra Pradesh, Bihar, Maharashtra, Odisha- and has undertaken a policy landscape analysis to explore the scope for FSN in these states (For details see http://mssrf-fs-fsn.com/).

The current report discusses the need and scope for a FSN approach in the state of Bihar. Agriculture continues to be the backbone of Bihar's economy with nearly three fourths of the workforce being dependent on agriculture and with the share of the agriculture sector in Gross State Domestic Product (GSDP) accounting for 22 per cent in 2013-14 (GoB, 2016). With nearly 89 percentage of population residing in rural areas, in 2011, and a majority of

them depending on small land holdings to eke out a living, the need to leverage agriculture for nutrition becomes significant in Bihar. This is particularly so in a context where malnutrition continues to remain a major challenge in rural Bihar.

The Report is organised in six sections: Section 1, the current section, discussed the context and perspective on FSN; Sections 2 and 3 discuss aspects relating to the nutritional and agriculture status of Bihar; Section 4 provides details on biofortified crops suitable for adoption in Bihar; Section 5 provides a desk review of government policies (central and state) that foster nutrition-sensitive agriculture in the state of Bihar; and Section 6 provides the policy recommendations for promoting farming system for nutrition approach in Bihar.

Section 2:

NUTRITIONAL PROFILE OF BIHAR

There have been several initiatives in Bihar to address the issue of malnutrition. **Figure 1** reveals that over a time period of one decade (2005 – 2015), there is a considerable decline in stunting wasting and underweight among children, of age under 5 years, in rural Bihar. However, the status of malnutrition continues to remain a challenge with nearly half of the children still malnourished and also one-fifth wasting among children under 5 years in 2015 – 16. Bihar is one of the few states in the country where wasting has shown a decline.

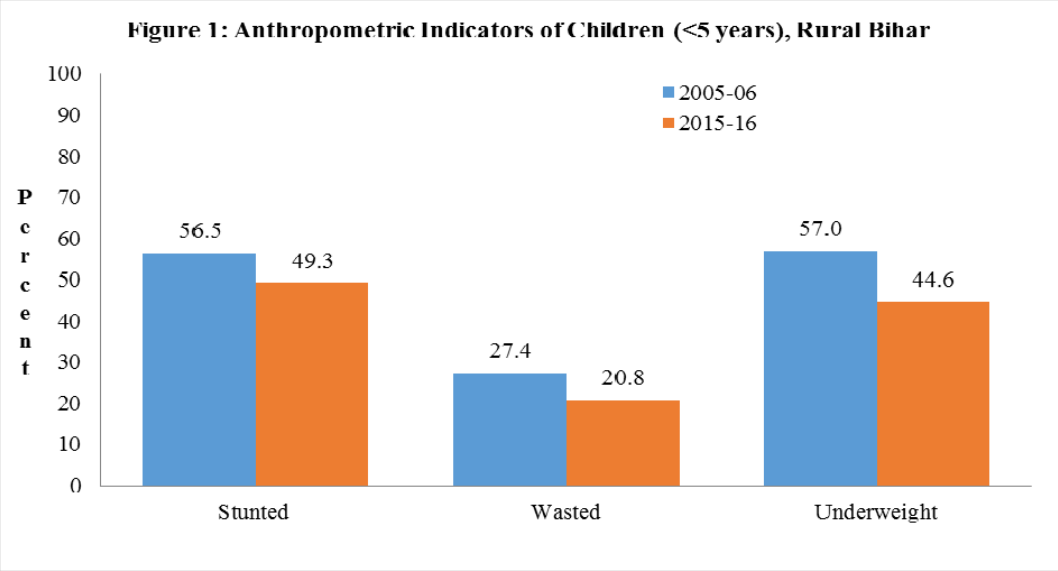


Figure 2 indicates that obesity is emerging as a nutritional problem even in rural Bihar.

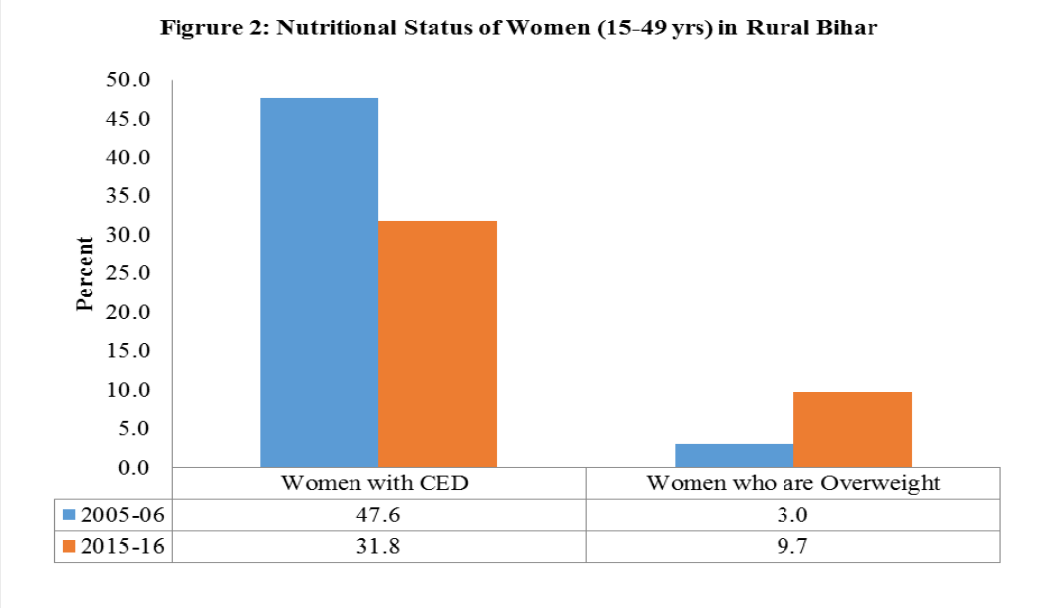
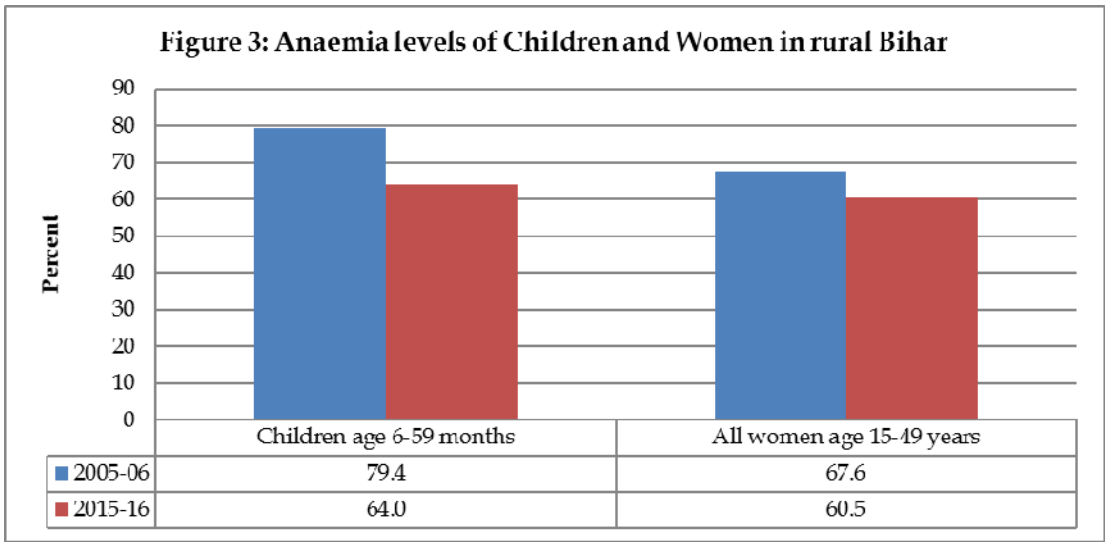


Figure 3 indicates that more than three-fifth of women and children are still anaemic in rural Bihar. This could be due to lack of iron rich diet and lack of vitamin C other co-morbid factors due to malnutrition, in turn inhibiting iron absorption.



Immediate factors influencing the malnutrition levels are the quality and level of food intake and the behavioural patterns influencing health and nutrition. Tables 2.1 & 2.2 provide details of these aspects in Bihar and all India.

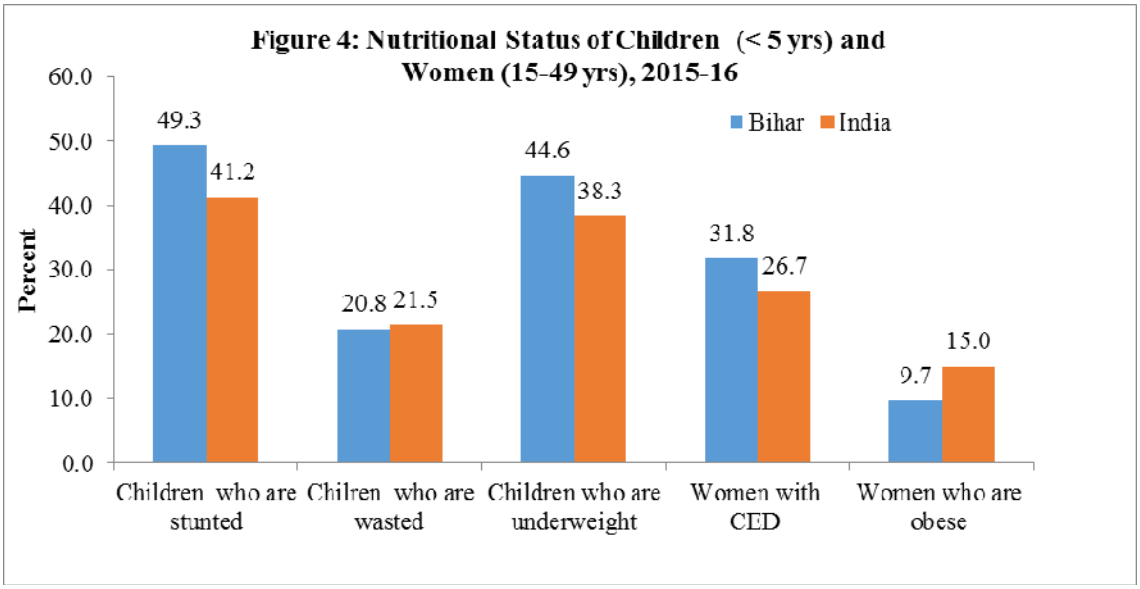
Table 2.1: Causes of Under-nutrition in rural areas of Bihar and India, 2015-16

Indicators	Bihar	India
Immediate Causes		
Children under age 3 years breastfed within one hour of birth (%)	34.2	41.1
Children under age 6 months exclusively breastfed (%)	54.2	56.0
Children age 12-23 months fully immunized (BCG, measles, and 3 doses each of polio and DPT) (%)	61.9	61.3
Prevalence of diarrhea in last 2 weeks preceding the survey (%)	10.7	9.6
Mother who had at least 4 antenatal care visits (%)	13.0	44.8
Pregnant women age 15-49 years who are anaemic (%)	58.0	52.1
All women age 15-49 years who are anaemic (%)	60.5	54.2
Underlying causes		
Women's status		
Population (female) age 6 years and above who ever attended school (%)	54.8	63.0
Women who are literate (%)	46.3	68.4
Women with 10 or more years of schooling (%)	19.5	27.3
Women age 20-24 years married before age 18 years (%)	40.9	31.5
Hygiene and Sanitation		
Household with improved drinking water source (%)	98.2	89.3
Households with improved sanitation facility (%)	20.7	36.7
Households using clean fuel for cooking (%)	10.8	24.0
Households with electricity (%)	54.1	83.2

Source: NFHS -4, 2015-16.

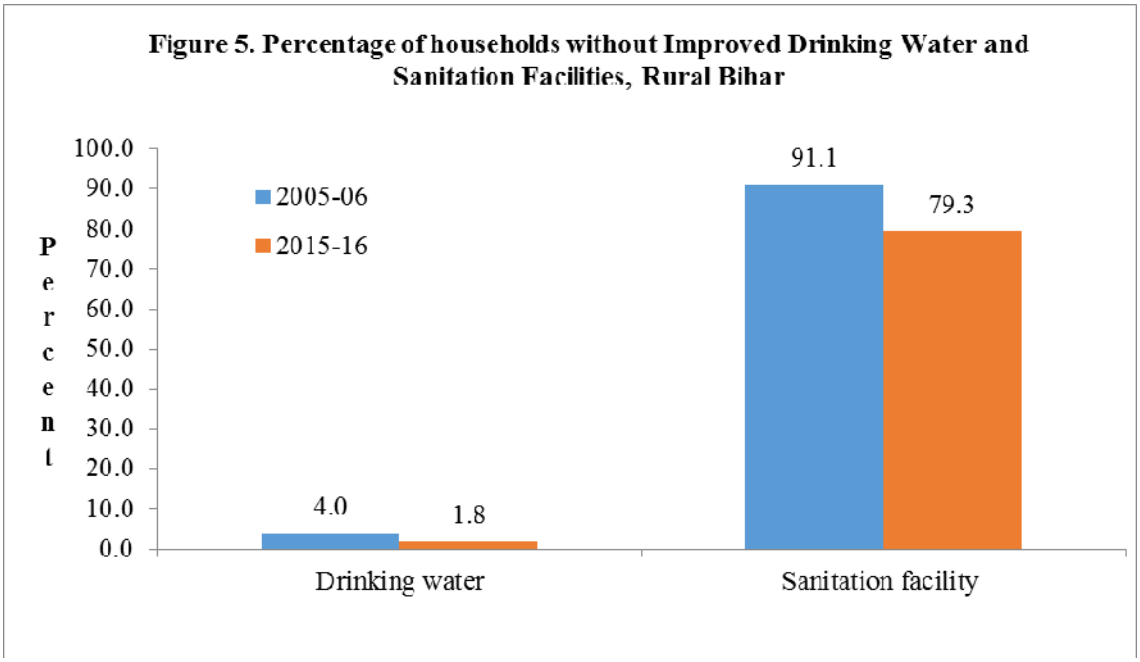
Table 2.1 shows that children who are exclusively breast fed as also children who have received immunisation are more or less the same in Bihar compared to India and this is perhaps related to successful implementation of focused schemes, targeting pregnant women and young mothers, that are being implemented in the state. However, mothers who had 4 antenatal visits are much lower in Bihar compared to India.

Figure 4 clearly shows that the nutritional status of children and women is lower than the national average except with regard to two indicators- wasting among children and obesity among women.



Status of Drinking Water and Sanitation

Access to safe drinking water, clean and hygienic environment have a positive influence on nutrition status. Figure 5 shows that more than three fourth of the households in rural areas of Bihar do not have access to proper sanitation facilities. While access to drinking water appears to be good, it is a well established fact that the quality of drinking water is a serious concern in Bihar.



An examination of the average level of food intake in rural Bihar indicates that with respect to cereals, the average monthly per capita intake is 12.13kg on par with the required dietary allowance (RDA) norm of 12kg/month/person[3]. Rice and wheat are both consumed in rural Bihar. Average per capita consumption of pulses and milk in rural Bihar is lower than the national average as well as the daily recommended allowances **(Table 2.2)**.

[3] Recommended Dietary Allowances are estimates of intakes of nutrients which individuals in a population group need to consume to ensure that the physiological needs of all subjects in that population are met.

Table 2.2: Monthly per capita quantity of consumption of selected commodities in rural areas, 2011-12

Commodities	Per capita average consumption of food items in rural areas	
	Bihar	**India**
Rice (kg)	6.04	6.03
Wheat (kg)	5.58	4.29
Total cereals	**12.13 (101%)**	**11.22 (94%)**
Arhar (Tur) –kg	0.08	0.21
Moong (green gram) -kg	0.08	0.09
Masur (red lentil)-Kg	0.29	0.11
Urd (black gram) kg	0.006	0.08
Gram split (kg)	0.127	0.08
Total pulses	**0.74 (31%)**	**0.78 (33%)**
Milk (litre)	**3.92 (44%)**	**4.33 (48%)**
Eggs (no.)	1.0	1.94
Fish (kg)	0.24	0.27
Goat meat /mutton (kg)	0.05	0.05

Note: 1) Recommended Dietary Allowances for cereals = 12kg/capita/month; RDA for pulses 2.4kg/capita/month & RDA for milk -9kg/capita/month as per the norms of Indian Council of Medical Research (ICMR).
2) Figures in brackets provide the percentages with respect to RDA norms.
Source: GoI (2014a); ICMR (2009).

To lead a healthy life, human beings need to consume a well-balanced diet which includes various nutrients in proper proportions: cereals, roots and tubers (that provide energy and fibre to the body); protein rich foods like pulses, meat, fish, eggs and milk and milk products (that help to build muscles); sugars and oil (that give instant energy); and fruits and vegetables (that provide the vitamins and minerals required for many metabolic functions in the body).

Table 2.2 indicates that the consumption of pulses and milk is below the recommended daily allowance. This results in deficiency of essential nutrients. It is in this context that promotion of nutrition sensitive agriculture becomes important as a method of enhancing household production of nutritious food, leading to diversified diet of farm families.

Section 3:

AGRICULTURAL PROFILE OF BIHAR

Status of Agriculture in Bihar

Bihar has been divided into three agro climatic zones- Zone-1 (North-West Alluvial Plain that is a water available area), Zone-II (North-East Alluvial Plain that is prone to floods), Zone-III (South Bihar Alluvial Plains that is a water deficient area). Zone I comprises of 12 districts; Zone II comprises of 9 districts while Zone III has 17 districts (**Figure 6)**.

Total geographical area of Bihar is 93.60 lakh hectares of which 56 per cent was net sown area in the year 2014-15. The net sown area as well as gross cropped area (GCA) has reported a decline by more than 3 lakh hectares during 1999-2000 to 2013-14, perhaps consequent to a corresponding increase in current fallow by 2.77 lakh hectares **(Table 3.1).** While the gross cropped area has declined during the last 15 year period, gross irrigated area (GIA) has increased by 5.39 lakh hectares. This has resulted in increase in the percentage of GIA to GCA from 59% to 68% during the last 15 years. The cropping intensity has remained at 1.4 over the 15 year period under consideration. It is also to be noted that the proportion of GIA to GCA is higher in Bihar than the national average **(Figure 7).**

Figure 6: Map of Agro Climatic Zones of Bihar

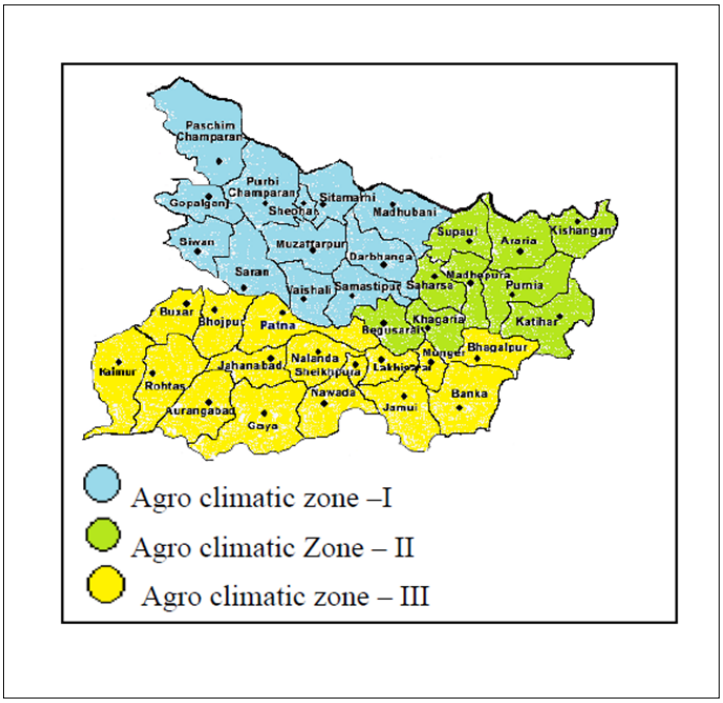
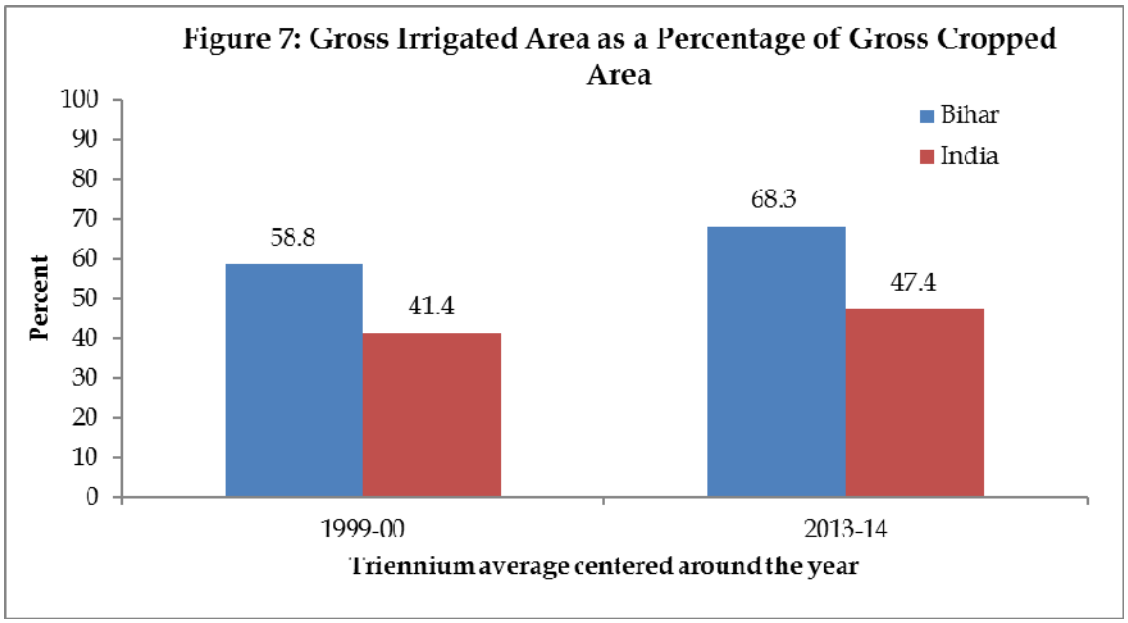


Table 3.1: Distribution of Land Use pattern in Bihar, 1999-2000 to 2013-14 (in Ha)

Triennium average centered around the year	Net area sown	Current fallows	Other fallows	Gross Cropped Area	Gross Irrigated Area
1999-00	5656141	579361	138368	8004345	4707067
2005-06	5597903	626860	127432	7504919	4389203
2009-10	5381505	811022	122059	7386913	4524204
2013-14	5310987	856257	120562	7676871	5246422

Source: www.indiastat.com



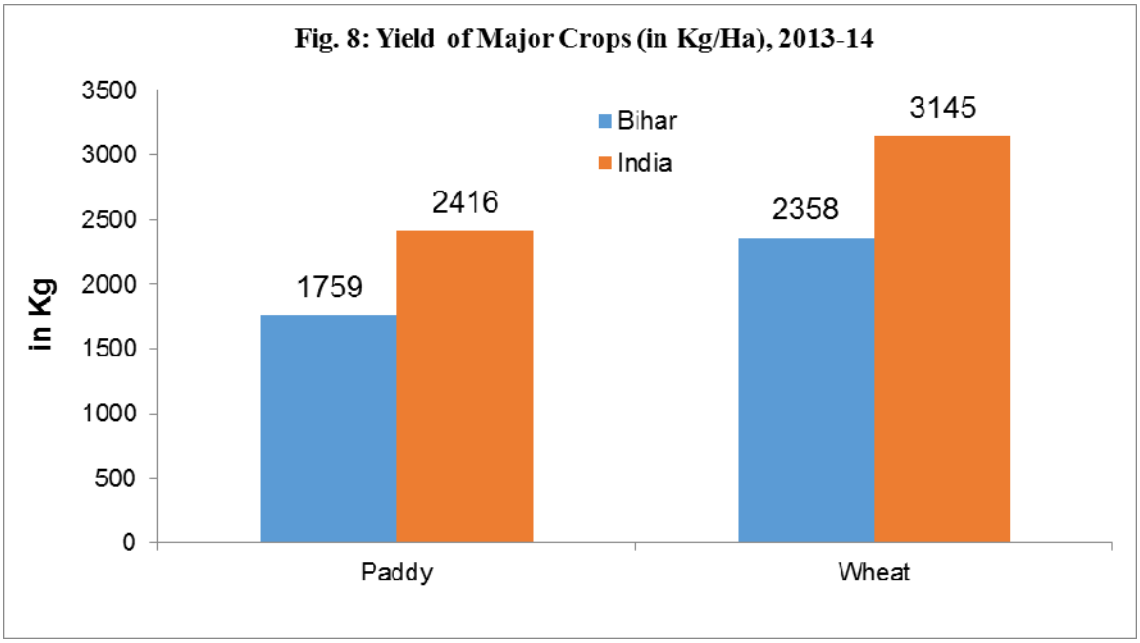
An analysis of cropping pattern for the last 15 years in Bihar clearly brings out the predominance of foodgrain based agriculture, with more than 85% of gross cropped area under foodgrains **(Table 3.2)**. Paddy alone accounted for more than two-fifth of the GCA, whereas wheat's proportion is more than one-fourth. Area under paddy has declined by around 4 lakh hectares during the last 15 years, while area under wheat and maize have increased during the same period. It is important to note that area under pulses declined by 2.14 lakhs during 1999-2000 to 2013-14. Fruits and vegetables occupied 6% of GCA in 2013-14. Sugarcane cultivated area doubled during the 15 years, from one lakh hectare to 2.56 lakh hectares.

Table 3.2: Distribution of Area under Major Crops in Bihar (in ha)

Triennium Average Centered around the year	Paddy	Wheat	Maize	Total Cereals & Millets	Total Pulses	Total Food Grains	Total Fruits & Vegetables	Other Crops	Gross Cropped Area
1999-00	36,30,601.3	20,66,970.3	6,28,976.0	63,87,709.0	7,21,663.3	71,09,372.3	4,10,948.0	4,84,025.0	80,04,345.3
	45.4	25.8	7.9	79.8	9.0	88.8	5.1	6.0	100.0
2005-06	33,01,301.7	20,30,529.0	6,44,943.3	60,21,470.7	6,17,607.0	66,39,077.7	4,13,611.7	4,52,230.0	75,04,919.3
	44.0	27.1	8.6	80.2	8.2	88.5	5.5	6.0	100.0
2009-10	31,54,889.0	21,06,753.7	6,39,715.0	59,32,616.3	5,55,109.3	64,87,725.7	4,21,238.0	4,77,949.3	73,86,913.0
	42.7	28.5	8.7	80.3	7.5	87.8	5.7	6.5	100.0
2013-14	32,37,691.7	21,70,315.0	7,10,731.0	61,44,783.3	5,07,267.0	66,52,050.3	4,57,070.3	5,67,750.0	76,76,870.7
	42.2	28.3	9.3	80.0	6.6	86.7	6.0	7.4	100.0

Note: Figures in shaded area are percentage to Gross Cropped Area
Source: www.indiastat.com

paddy yield in Bihar is 1759 kg per hectare with regard to crop yield, whereas the national average is 2416 kg/ha; wheat yield is 2358 kg/ha in Bihar and corresponding figure for India is 3145 kg/ha (GoI, 2016) **(Figure 8)**.

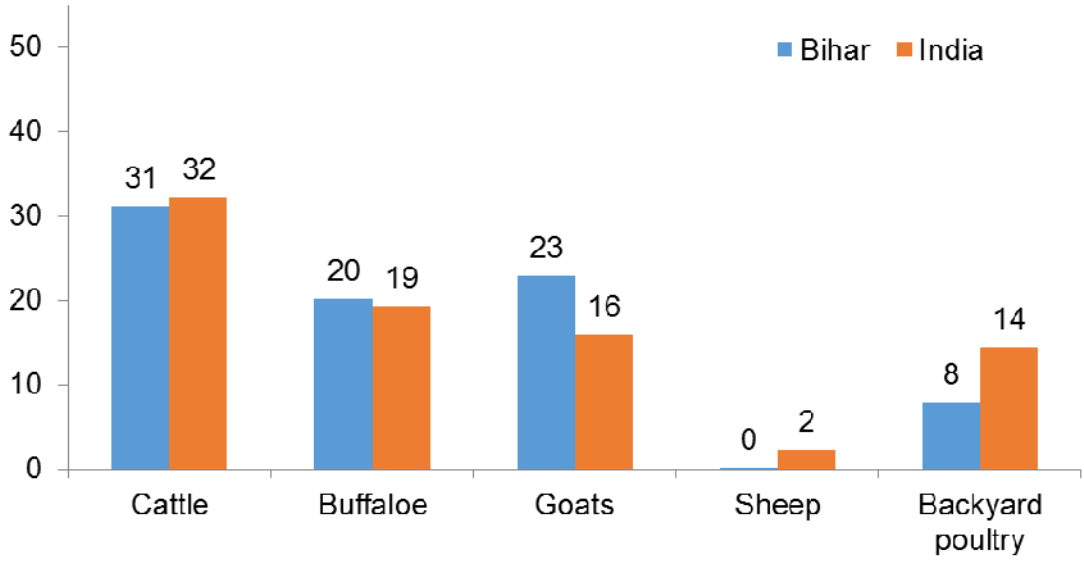


In sum, Bihar's agricultural economy is food grain based with paddy and wheat being the major food grains; there is a notable decline in area under paddy and pulses while wheat and maize are gaining currency. While availability of irrigation is of a relatively higher order in Bihar, the yield levels of paddy and wheat are lower than the all-India average; this is indicative of a more backward and more risk prone agricultural system in Bihar.

Livestock Population and Its Ownership

According to the Livestock Census 2012, (GoI, 2014a), among the rural households in Bihar, nearly one third own cattle, more than one-fifth own goat and one-fifth own buffalo **(Figure 9)**. With regard to households owning cattle and buffalo, the pattern in Bihar is more or less similar to the all India average. The percentage of households in rural areas with ownership of backyard poultry is about 8% and is lower by 6 percentage points compared to all India.

Fig 9 : Percentage of Rural Households Owning Animals/Backyard Poultry, 2012



Livestock population is spread across the districts in Bihar. Araria district recorded highest percentage of cattle population (8%) and goat population (6%) in the state **(Table 3.3).**

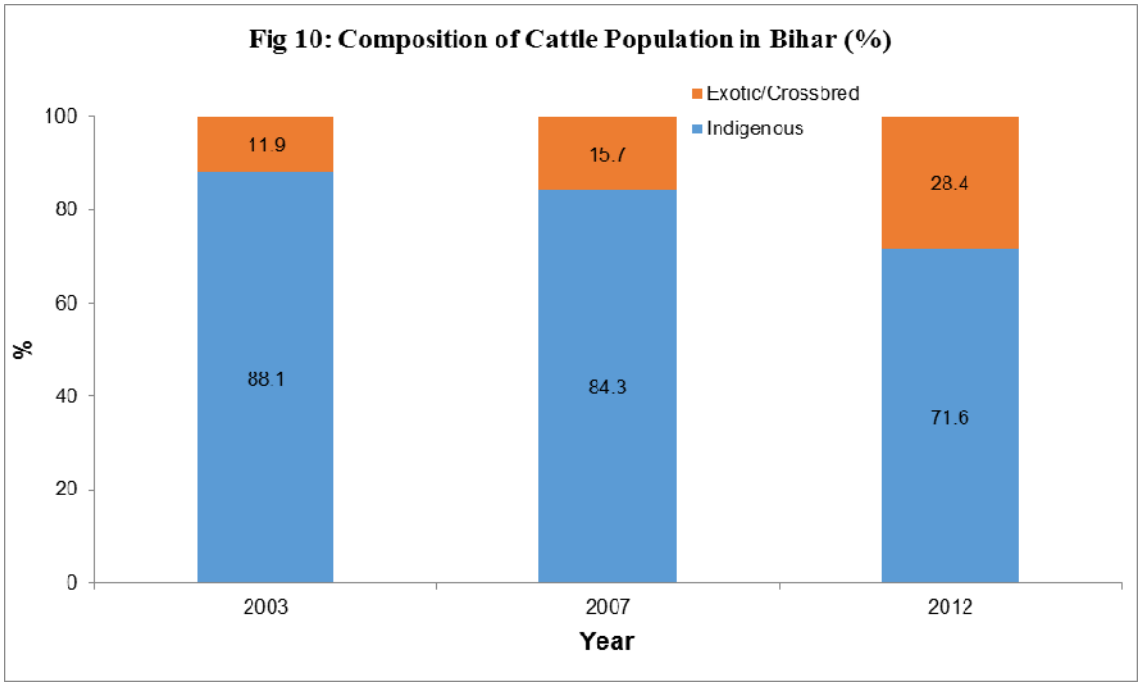
Table 3.3: Classification of Districts by percentage share of Cattle and Goat population in Bihar State, 2012

Percentage share of cattle/goat population in district to state Total	Names of districts w.r.to of Cattle Population	Names of districts w.r.to of Goat Population
Above 5	Araria, Gaya	Araria, Purbi Champaran
2 to 5	Aurangabad, Banka, Begusarai, Bhagalpur, Jamui, Katihar, Kishanganj, Madhubani, Paschim Champaran, Purnia, Rohtas, Samastipur, Supaul	Banka, Bhagalpur, Darbhanga, Gaya, Jamui, Katihar, Kishanganj, Madhepura, Madhubani, Muzaffarpur, Paschim Champaran, Purnia, Rohtas, Saharsa, Samastipur, Sitamarhi, Supaul, Vaishali
Less than 2	Arwal, Bhojpur, Buxar, Darbhanga,Gopalganj, Jahanabad, Kaimur, Khagaria, Lakhisarai, Madhepura, Munger, Muzaffarpur, Nalanda, Nawada, Patna, Purbi Champaran, Saharsa, Saran, Sheikhpura, Sheokar, Sitamarhi, Siwan, Vaishali	Aurangabad, Arwal, Begusarai, Bhbhua, Bhojpur, Buxar,Gopalganj, Jehanabad, Khagaria, Lakhisarai, Munger, Nalanda, Nawada, Patna, Saran,Siwan, Sheikhpura, Sheohar

Source: GoI, 2014

In Araria district, presence of cattle and goat population is relatively high while it is very low (less than 2 per cent of state's population) in Arwal, Bhojpur, Buxar, Gopalganj, Jahanabad, Khagaria, Lakhisarai, Munger, Nalanda, Nawada, Patna and Saran Siwan districts.

It is important to note changes in the composition of cattle population in Bihar. The exotic/crossbred variety has increased from 12% to 28% during 2003 to 2012 **(Figure 10),** perhaps contributing to the increase in the per capita availability of milk from 88 grams per day to 219 grams per day during 2001-02 to 2015-16, in Bihar (GoI, 2015).



Though the per capita availability of milk has increased by 2.5 times in Bihar during the period 2001 - 2016, this remains lower than the all India average. All India per capita milk availability was 225 grams per day in 2001-02 and increased to 337 grams per day in 2015-16.

The *per capita* egg availability in Bihar was just 9 eggs per annum in 2013-14, the lowest level among the major states. All India per capita egg availability per annum in 2013-14 was 61 eggs.

Bihar has 1.60 lakh hectares of inland fishery resources and 60% of them are tanks & ponds and 38% are reservoirs (GoI, 2015).

Section 4:

BIOFORTIFICATION

"Biofortification is the process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding, or modern biotechnology. Biofortification differs from conventional fortification in that biofortification aims to increase nutrient levels in crops during plant growth rather than through manual means during processing of the crops. Biofortification may therefore present a way to reach populations where supplementation and conventional fortification activities may be difficult to implement and/or limited" (WHO, 2016).

Details of biofortified and stress tolerant crops that are developed and are suitable for Bihar are listed in **Table 4.1.**

Table 4.1. BIOFORTIFIED / STRESS TOLERANT CROPS SUITABLE FOR BIHAR

Sl. No:	Crops	Variety/ Hybrid	Nutrient Availability / Stress tolerance Characteristics	Developed / Released by	Seed Availability Status[1]
1.	**Rice**	Swarna Sub-1	**Submergence Tolerant Variety** • Tolerant to submergence & flash floods • Yield per hectare: 5.0 -5.5 tonne • Duration: 140 -145 days • Recommended for shallow low land areas of coastal region.	International Rice Research Institute (IRRI) & National Rice Research Institute (NRRI), Cuttack Released in 2009	Breeder and Truthfully Labelled (TFL) seeds available at NRRI
		Sushk Samrat	**Drought Tolerant Variety** • High yielding and drought tolerant • Yield per hectare: 3.0 – 3.5 tonne • Duration: 100 - 105 days.	Narendra Deva University of Agriculture and Technology (NDUAT), Uttar Pradesh Released in 2006	Breeder seeds available at NDUAT
		Swarna Shreya	**Drought Tolerant Variety** • High yielding and drought tolerant • Yield per hectare: 4.5 - 5.0 tonne • Duration: 120 - 125 days • Recommended for rainfed lowland.	ICAR Research Complex for Eastern Region, Patna. Notified in 2015	TFL seeds available at ICAR Research Complex for Eastern Region, Patna
2.	**Pearl Millet**	Dhanashakti (ICTP 8203 Fe)	**Biofortified Variety** • Rich in iron 71. ppm (45-50 ppm) & zinc 40 ppm (30-35 ppm). • Yield per hectare: 2.21 tonne	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad and Mahatma Phule	Truthfully Labelled (TFL) seeds available with Nirmal Seeds Private Limited, Maharashtra.

				Krishi Vidyapeeth, Rahuri Released in 2014	
3.	**Wheat**	K-1006	**Biofortified Variety** • Rich in zinc 49.2 ppm (40.0 - 45.0 ppm) and iron 45.4 ppm (35.0 - 40.0 ppm). • Non–synchronous tillering and bold grains • Yield per hectare: 4.0 tonne • Duration: 123 days • Recommended under normal planting situation	Chandrasekhar Azad Agriculture University (CSAU), Kanpur Certified by Central Variety Release Committee (CVRC) in 2014	Breeder and foundation seeds available at CSAU, Kanpur
4.	**Quality Protein Maize**	Pusa HM 9 Improved	**Biofortified (Hybrid)** • Contains tryptophan 0.68 % (0.3-0.4 %) and lysine 2.97 % (1.5-2.0 %). • Yield per hectare: 5.2 tonne • Duration: 89 days • Recommended for kharif season	Indian Agricultural Research Institute (IARI), New Delhi Released in 2017	Breeder seeds available at IARI, New Delhi
		HQPM-1	**Biofortified (Hybrid)** • Quality protein maize hybrid possesses lysine and tryptophan double than conventional maize • Yellow dent grains • Yield per hectare: 6.2 tonne • Duration: Late duration	Chaudhary Charan Singh Haryana Agricultural University (CCS-HAU), Hisar Released in 2007	Certified seeds available with National Seed Corporation Limited

		HQPM-4	**Biofortified (Hybrid)** • Possess lysine and tryptophan double than conventional maize • Orange flint grains • Yield per hectare: 5.4 tonn**e** • Duration: Late duration	CCS-HAU, Hisar Released in 2010	Certified seeds available
		HQPM-5	**Biofortified (Hybrid)** • Possess lysine and tryptophan double than conventional maize. • Orange flint grains. • Yield per hectare: 5.8 tonne • Duration: Late duration.	CCS-HAU, Hisar Released in 2007	Information not available
5.	**Lentil**	Pusa Vaibhav (L4147)	**Biofortified Variety** • Contains iron 102.0 ppm (55.0 ppm) • Yield per hectare:1.7 tonne • Duration: 120 - 125 days	IARI, New Delhi Released by CVRC in 1997	Information not available
6.	**Foxtail Millet**	Suryanandi (SiA 3088)	**Biofortified Variety** • High iron content 129.0 ppm (27.19 ppm) • Non-lodging type • Yield per hectare: 2.0 - 2.5 tonne • Duration: 70 -75 days	Regional Agriculture Research Station (RARS), Nandyal Released in 2012	Breeder and TFL seeds available with RARS, Nandyal
7**.**	**Little Millet**	Tarini (OLM 203)	**Biofortified Variety** • High iron content 51.0 ppm (32.71 ppm). • Yield per hectare: 1.0 -1.1 tonne • Duration: 105-110 days	Odisha University of Agriculture and Technology (OUAT), Bhubaneswar Released in 2001	Information not available

“Micronutrient deficiencies are a problem that is much greater than hunger and is a prime example of the need to integrate both food and nutrition security. Sustainable food-based approaches to enable adequate consumption of micronutrients include dietary diversification and biofortification. Agriculture and agricultural biotechnology not only offer the opportunity of increasing crop yields, thereby increasing food security, but also have the potential to improve the micronutrient content of foods, thus contributing to the achievement of both food and nutrition security” (Shetty, 2009).

Given the availability of suitable biofortified varieties, particularly in rice, wheat and maize there is scope to promote these varieties among farmers through appropriate policies. Needless to add, promoting these varieties will have to be based on detailed field based studies on their efficacy.

Section 5:

POLICY LANDSCAPE ANALYSIS OF BIHAR

This section presents a desk review of the current landscape of state and central government policies that foster nutrition-sensitive agriculture by both promoting farming systems for nutrition and improving food and non-food factors that enhance the availability of nutrition-rich foods in rural households and markets in Bihar. The analysis framework recognizes policy emphasis on each of 4 direct or core domains of farming systems for nutrition and 3 enabling or non-core domains[4]. A description of the policies considered within each domain is provided in **Table 5.1.** In order to identify areas for improvement, we review government documentation on both the policy agenda setting and the policy adoption stages of the policy making process (Sutton 1999).

The review of policy agenda analyses farming system for nutrition related visions and goals identified formally by the state government in long-term policy documents. The review of policy adoption collates farming system for nutrition related schemes and programmes that have been adopted by the state government through the allocation of funds in the state budget. The landscape analysis conducted at both stages enables us to identify whether policy gaps are arising from lack of recognition of policy issues or solutions, or a lack of implementation of policy solutions.

Table 5.1: Farming System for Nutrition policy domains

Domain	Description
1. Agricultural Production Diversity	Policies that encourage integrated farming systems and farm-level diversity combining agriculture, horticulture, animal husbandry and fisheries with the intention of enhance the availability of nutrients within a household or local market.
2. Agricultural Production	Policies that improve the production and productivity to enhance the availability of nutrient-rich food in the regional market
3. Biofortification	Policies that encourage the production of nutrient-dense biofortified varieties for the regional market
4. Agricultural Value Chains	Policies that support the production of nutrient-rich crops by creating handling, storage, processing infrastructure, and avenues for marketing and value addition to enhance availability in the local market
5. Nutrition-Education and Behaviour Change	Policies that improve the demand for nutrient-rich crops through awareness creation and behaviour change communication
6. Women's Empowerment	Policies that improve the demand for nutrient-rich crops by empowering women to exercise their choice in household agriculture and nutrition
7. Natural Resource Management	Policies that support the production of nutrient-rich crops by conserving natural resources

[4] Policies to improve access to safe drinking water and sanitation have not been covered in this analysis. However, the status with respect to these factors has been discussed in Section 2.

Though the state government has accorded great importance to agriculture and has undertaken several initiatives to improve productivity and farmer incomes while conserving resources, there is ample potential to integrate nutrition objectives into agricultural policy, with the aim of reducing Bihar's malnutrition burden while also encouraging the production of diverse, risk tolerant, high-value and marketable crop and animal products. The scope available in the policies to enhance the nutrition focus is discussed below.

5.1 Review of Policy Agenda and Policy Adoption

The first step in the policy-making process is "agenda-setting" or the recognition of a problem or space where policy can make a positive difference. Once a problem is recognized by policymakers and policy influencers, the scope arises for democratic deliberation and "adoption" of a policy solution (Jann and Wegrich 2007). To understand whether state governments have recognized nutrition as a policy problem and the potential for agriculture to provide a policy solution, we review progress made in both the "agenda-setting" and "adoption" stages.

We analyzed prominent "agenda documents" - long term mission or vision statements or polices adopted by the Government of Bihar for indications that the various domains of farming systems for nutrition form a part of the state government's agenda. Uniquely Bihar has created Agricultural Road Maps detailing the progress and way forward for agricultural policy for each five-year period from 2008. The third Road Map, for the period 2017-2022, is comprehensive in coverage and progressive in outlook. It also lays down areas for coordinated action between otherwise independent line departments. Apart from the Road Map, the documents analysed include the Bihar State Action Plan for Children (2017), the Recommendations of the State Level Task Force on Agricultural Development (2015), Fisheries Policy (2008), Breeding Policy (2008) and the Vision 2015: Food Processing in Bihar, the Road Ahead (2012).

As a next step after "agenda-setting" in the policy-making process we analyze the status of policy formulation and "adoption". A core element of policy adoption is the specification of program details and the allocation of resources, including human and physical capital (Jann and Wegrich 2007). In the absence of a publicly available comprehensive record of adopted

policies, we define the set of adopted policies as those that have received a budget allocation in the state budget. For Bihar, we include the most recently presented state budget, for 2018-19, looking to the Road Map and online documentation for further information on particular schemes. All policies relating to the 4 "*core*" domains and nutrition-sensitive policies in the 3 "*non-core*" domains of "*farming systems for nutrition*", from the budgets of the departments of agriculture, co-operation and farmer's welfare, animal husbandry, fisheries, women and child development, rural development, health, medical and family welfare, backward classes and minority welfare.

The agenda and policy documents together define the scope of priorities recognized by the state government and action taken thus far in building a "*farming system for nutrition"*. A brief description of the government agenda categorized according the key aspects identified in Table 5.1 is summarized below. The full list of agenda statements and policies points can be found in Appendix 1 and 2 respectively.

Bihar has much ground to cover in bringing agricultural productivity and nutrition indicators up to the national average and to global standards. This provides a unique opportunity for Bihar to pursue a growth path for agriculture that is both sustainable and nutrition-sensitive. Commendable steps have been taken to identify the challenges to agricultural growth and policy strategies to overcome them in the Krishi Road Maps. As a cross-disciplinary document, the Road Maps are instrumental in achieving coordinated action towards all the 7 domains of FSN (Table 5.1) and addressing malnutrition in Bihar. However, policies can only achieve intended impacts if they are adopted by the state executive, implemented well and accessible to the most nutritionally vulnerable. Schemes must be well designed and the institutional, infrastructural and financial requirements for implementation must be met. While the recommendations of the Road Map are quite comprehensive, there is scope for a lot more policy action in each of the domains.

The policy landscape analysis reveals specific gaps that can be addressed in order to achieve nutrition for all through agricultural growth. These gaps occur in both the "policy agenda-setting" as well as "policy adoption" stages. A summary of these gaps and scope available is provided in **Table 5.2.**

Table 5.2: Gaps in *"Farming System for Nutrition"* Policy Agenda and Adoption

Policy Agenda	Policy Adoption
Domain 1: On-farm Production Diversity	
Policy Agenda Status: Integrated farming systems (IFS) is well recognized in the Krishi Road Map and Task Force recommendations. The simultaneous benefits of crop diversification in improving productivity, expanding the food basket as well as mitigating climate risks have been highlighted. Strategies for both landless and landowning farmers, and special schemes for the integrated development of flood plains have been laid down. **Policy Agenda Scope:** • **Strategies must include need-based cropping system planning** - whereby nutrition deficiencies/needs of the household or community are taken into account when introducing IFS • Guidelines for organizing kitchen/community gardens and backyard farming with the objective of improving nutrition can be specified • Convergence between departments is required for enabling integrated farming systems.	**Policy Adoption Status:** Kitchen gardens are being promoted as part of the Bagicha Bachao Abhiyaan. Central schemes such as NFSM, IWMP and NMSA, and the recent Kosi Basin Development project promote mixed cropping for productivity enhancement and resource conservation. Some SHGs under the JEEViKA program undertake integrated farming and kitchen gardening activities as part of their livelihoods activities. **Policy Adoption Scope:** • A state initiative to promote low input integrated farming incorporating agriculture, horticulture, backyard poultry, livestock and fisheries on a need-basis is required • Expand and systematize a role for "farming system for nutrition" within the livelihoods activities of SHG based programs
Domain 2: Agricultural Production	
Policy Agenda Status: The Krishi Road Map outlines several strategies to responsibly boost productivity. Steps have been taken to incentivize local entrepreneurs in seed processing, equipment manufacturing and maintenance – which will both improve productivity and employment opportunities. Important initiatives for improving pulses, horticulture, livestock and fisheries productivity have been specified. A comprehensive set of extension activities have been defined with the objective of	**Policy Adoption Status:** Special State schemes to improve availability and quality of seed, extension and mechanization are in place. Organic farming is promoted through an Incentive Scheme and institutional strengthening for certification is provided. Horticulture, livestock and fisheries production are well supported by their respective departments.

meeting global challenges of climate changes and sustainable farming. An extension to the Organic Farming Incentive Scheme has also been proposed. **Policy Agenda Scope:** • Develop strategies to improve production of nutritionally rich cereals and millets so that calorie under-nutrition can be met. • Nutrition-sensitive agriculture can be made a priority area for extension, like with climate change. Provide adequate training to extension workers on diet diversity and the nutritional value of crops.	**Policy Adoption Scope:** • Focused state policies on improving production and climate resilience of pulses, millets, fruits and vegetables can ensure consistent availability across state.
Domain 3: Biofortification	
Policy Agenda Status: Bihar is among the few states which envisions a role for bio-fortified crops in the State Agenda. The Krishi road map recommends the promotion of nutrient-rich varieties such as Dhanshakti (iron-rich pearl millet) and Quality Protein Maize. **Policy Agenda Scope:** • Other bio-fortified varieties of millet, tubers etc can also be promoted to meet Bihar's nutritional requirements. • Complete value chain development must be pursued for bio-fortified crops in order to incentivize both production and consumption.	**Policy Adoption Status:** While bio-fortified crops are singled out by the Road Map, state-wide schemes for the promotion of bio-fortified crops are yet to be adopted. **Policy Adoption Scope:** • As per the Road Map, production bio-fortified varieties can be incentivized and a market linkage can be provided by means of a stand-alone state scheme. • These varieties can also be promoted through the livelihood activities of SHGs in JEEViKA and the State Rural Livelihoods Mission.
Domain 4: Agricultural Value Chain	
Policy Agenda Status: Focus is on improving the processing capacity and reducing wastage of produce in the state. The approach includes modernizing market premises, making markets accessible and more transparent, developing region-specific infrastructure, entrepreneurship skills and active farmer groups. Laudably, specific initiatives have	**Policy Adoption Status:** State schemes with the intention of improving agricultural processing and agri-business are in place. Externally aided programs such as the Kosi Basin Development Project and JEEViKA platform provide market linkages.

been identified for all major nutritional food groups – pulses, fruits and vegetables, milks, eggs and animal protein. For horticulture crops, a hub and spoke terminal system is recommended with a focus on rural haats. Free organic certification is proposed. **Policy Agenda Scope:** • Decentralized storage, processing and marketing can be incentivized to cater to **rural markets where nutrient-deficiency is more prevalent**. • End to end value chain must be developed for millets and bio-fortified food crops.	**Policy Adoption Scope:** • There exists a lot of scope for converting the recommendations of the Road Map into policy – especially in developing of region-specific infrastructure, modernizing and linking markets and organizing rural haats. • Value-chain improvements for nutrient-rich crops such as pulses, millets, fruits and vegetables must be prioritized. • Rural entrepreneurs in food processing and dairy/fish cooperatives can be encouraged to supply to deficient areas.
Domain 5: Nutrition education and behaviour change	
Policy Agenda Status: The State Policy for Children 2017 encourages focused behaviour change communication towards improving nutrition in young children through a lifecycle approach – i.e. by ensuring availability of nutritious food and essential services to adolescents, expectant and young mothers, and by providing nutrition education and knowledge of childcare practices at the household and community level. In the agricultural agenda, the road map envisions a role for BCC only in fisheries through mass media campaigns. **Policy Agenda Scope:** • Forthcoming nutrition policy must carry guidelines for contextualized BCC that can provide awareness on nutrition-sensitive agriculture, local nutrition deficiencies and locally available nutrient-rich crops/livestock. • Nutrition education must appeal to men and women of all age groups to effect a change in dietary diversity of the household.	**Policy Adoption Status:** Major national schemes of the Dept. of WCD are in place. Programs are being undertaken with external aid under the JEEViKA. **Policy Adoption Scope:** • The existing WCD programmes can incorporate state-specific guidelines for nutrition education/BCC to provide more contextualized information. • Nutrition BCC programs can extend nutrition education to men and women of all age groups who make farming and dietary decisions in the household rather than mothers and children alone.

<table>
<tr><th colspan="2">Domain 6: Women's empowerment</th></tr>
<tr><td>Policy Agenda Status:

The Krishi Road Map recognises the role of women in agriculture, as labourers, producers, users of technology, and market participants. It calls for the introduction of structural, functional and institutional measures to facilitate the empowerment of women in agriculture – especially by introducing and subsidizing women friendly agricultural equipments, providing better access to credit and inputs, forming and strengthening SHGs and women's cooperatives in dairy and aquaculture.

Policy Agenda Scope:

• Women, as decision-makers in both agriculture and nutrition of a household are uniquely placed to receive information and support for nutrition-sensitive agriculture, including integrated farming and backyard cultivation/livestock rearing. A women-centric strategy for implementing FSN can be defined, leveraging existing livelihoods program infrastructure such as the BRLPS and MKSP.</td><td>Policy Adoption Status:

Major national schemes of the Dept. of WCD are in place. The Chief Minister's Scheme for empowerment of women and support for girl child are important state initiatives. The Bihar Transformative Development Project aided by the World Bank has organized and empowered women in SHGs.

Policy Adoption Scope:

• Agriculture Dept. schemes can be gender-sensitised according to the recommendations made in the Road Map.
• Programs like MKSP and externally funded multi-sectoral nutrition interventions through SHGs can be continued to achieve convergence between agriculture, nutrition and gender goals of the state</td></tr>
<tr><th colspan="2">Domain 7: Natural Resource Management</th></tr>
<tr><td>Policy Agenda Status:
Bihar has a strong Natural Resource Management Agenda in place which recommends – construction of essential moisture conservation infrastructure, rain water harvesting, promotion of agro-forestry and sustainable crop-rotation, development of flood-plains and ox-bow lakes, micro-irrigation and soil testing-based nutrient management. A Disaster Risk Reduction Road Map (2015-2030) has been outlined.

Policy Agenda Scope:
• Farming system for nutrition can be promoted as a strategy for resource</td><td>Policy Adoption Status:
Taal Development scheme and Kosi Development Scheme are important state initiatives for drought prevention. Central schemes for soil health, watershed management and organic farming in place.

Policy Adoption Scope:

• Special programs for the development of ox-bow lakes ('chaur') and flood-plains ('maun') can be pursued according the directions of the Road Map.
• Sustainable agriculture practices recommended for soil and water management or climate resilience can be</td></tr>
</table>

conservation.	made nutrition-sensitive by incorporating nutritional needs in cropping system planning.

*See Appendix A for the full list of goals and vision recognized by the Bihar State Government

**See Appendix B for the full list of schemes and programs adopted by the Bihar State Government.

See Appendix C for the sources referred.

Section 6:

RECOMMENDATIONS FOR PROMOTING FARMING SYSTEM FOR NUTRITION

Bihar has made significant strides in reducing malnutrition over the years, however, the prevalence of stunting and wasting remains the highest among Indian states. One in every two children in Bihar is stunted and underweight and anaemia among women and children is very high, making improved nutrition a top priority for the state. Given the extent of malnutrition, there is a role for both short-term intensive nutrition-specific interventions as well as long-term sustainable nutrition-sensitive interventions to tackle the problem. Adopting a farming system for nutrition approach in the state can potentially be a long-term solution to combat malnutrition while also contributing to the economic growth story of the state.

The Bihar Krishi Road Map (2017-2022) and its predecessors have been landmark documents laying out both the current policy status and areas for further action. The Road Map is visionary and comprehensive in its scope and also recognizes the role of agriculture in critical global challenges such as climate change, resource conservation and gender equality. The subsequent Road Maps can recognize malnutrition as yet another challenge and define a role for agriculture within it. Some recommendations for promoting agriculture-nutrition linkages are suggested below:

1. **Improved nutrition must be placed as a key agenda in promoting Integrated Farming Systems (IFS).** The benefits of integrated farming systems in mitigating climate risk, diversifying diets and generating income, especially among smallholder farmers, has been recognized by the Government of Bihar. However, recommended integrated farming systems can be made nutrition-sensitive by tailoring them to address the nutritional deficiencies prevalent in a specific region. Steps can be taken by the government to lay guidelines for need-based farming system planning, formally recognize improved nutrition as a goal for agricultural department budgets and implement this message in extension efforts and livelihoods programmes. Convergence between relevant departments – agriculture, horticulture, animal

husbandry and fisheries- is needed to ensure ease of access to relevant inputs and knowledge.

2. **Promote fisheries and integrated fish and food crop farming as part of natural resource management efforts in ox-bow lakes (chaurs) and floodplains (maun) and wetlands.** Bihar has the potential to capitalize on its unique natural resources in a sustainable manner. The vast scope that is available to promote integrated aquaculture-agriculture-livestock systems can be exploited to improve the productivity of low-lying wetlands and provide food and nutrition security throughout the year to rural and tribal communities residing in these areas.

3. **Strategy for promotion of biofortified varieties must be developed**. While the Road Map recognizes the availability and scope of key biofortified varieties, it does not identify them as effective solutions for meeting the State's nutritional requirements, especially in areas with high malnutrition. In order to promote the production and consumption of these crops a complete end-to-end strategy must also be recommended. A state programme to incentivize the production and consumption of high-iron, high-zinc varieties or rice and millets, high-protein maize and orange flesh sweet potato can be put in place to reduce malnutrition without having to drastically alter food and cropping patterns.

4. **Right to Homestead land and convergence with suitable schemes**. Bihar was probably the first state in the country to enact a separate law, namely the Bihar Privileged Persons Homestead Tenancy Act 1947, for providing security of tenure to landless rural households over their homestead land. In addition, there have been other policies and schemes to include those who are not covered by this Act, such as, 'Policy for Providing Homestead Land to Mahadalits'. Given the availability of suitable legal provisions for making available homestead land to homestead-less families in the State, the requirement is with regard to exploiting the full potential of this entitlement. Bringing about convergence between provisions for homestead land and other government schemes such as Women Food Security Groups that promote nutrition garden for vegetable cultivation, backyard poultry, goat-rearing and horticulture, could be an important way to enhance food and nutrition security of the families that have received homestead plots.

5. **Leverage the strong SHG platform in Bihar.** Given the important role played by women in agriculture as well as nutrition, Self-Help Groups (SHGs) and women farmers groups based livelihoods programmes carry significant potential to empower women in agriculture and transform rural diets. Bihar has strong experience with SHGs and massive externally aided programmes are underway to deliver essential nutrition, livelihood and income-generating interventions to rural women through these groups. Going forward too, these groups can serve as an asset in mediating the change towards more inclusive cropping patterns and diets.

6. **Incentivize supply of nutritious food in rural markets, through decentralized storage, processing and marketing through farmer groups.** As recommended in the Road Map, local entrepreneurs and farmer groups must be encouraged to set up storage and food processing businesses and supply to rural markets. This can provide employment opportunities while also ensuring that the demand for food in remote rural areas is met. Development of rural haats, as recommended in the Road Map, should be initiated to reduce supply bottlenecks.

7. **Improve productivity and climate resilience of nutritious crops.** Focused schemes to improve productivity of pulses, fruits and green leafy vegetables to be formulated and implemented. Adopting the recommendations given in the Road Map on improving agricultural extension services, mechanisation and seed availability would be important.

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APPENDIX A

REVIEW OF POLICY AGENDA: GOALS AND VISIONS RECOGNIZED BY THE BIHAR STATE GOVERNMENT

Part A of Review of Policy Agenda: GENERAL AGENDA STATEMENTS EXTRACTED FROM LISTED SOURCES*

CORE DOMAINS	**1. Agricultural Production Diversity**	*- Small farm agriculture is a compulsive situation and to make it viable is the highest challenge. Integrated farming may be a solution and it needs to be encouraged. Animal husbandry and fisheries are the key sectors besides crops and horticulture.* *- To mitigate the adverse impact of climate change we need to explore more and more crops and animals in the food basket. There is a dangerous trend of shrinking food basket limited to few crops and varieties. Biodiversity within the species and among the species must be restored. Diversification among enterprises and diversification of varieties will have an important role to play in the coming times.* *- Crop and varietal diversification may be introduced to achieve qualitative increase in crop productivity. While increasing crop production and productivity, soil, water, animal and human health may be conserved and protected*

		- Natural resource management programs for landholding farmers: encouraging establishment of plant nursery and vegetable production programme in panchayats through creation of consumer groups/SHGs, encouraging crop diversification and integrated agriculture system for small/marginal farmers *- Natural resource management programs for landless farmers: Implementing vegetable production, mushroom production, vermi compost production and animal husbandry programmes through SHG. Promotion of commercial cultivation of crops Drumstick and Castor on barren lands.*
	2. Agricultural Production	*' Seed:* *- Train farmers, provide subsidized foundation seed and promote the production of certified seeds of the latest varieties of hybrid paddy, wheat, maize and oilseeds within the different districts.* *- Bihar State Entreprenuership Development Programme: provide assistance to the farmers on procurement of breeder/Foundation seed, construction of godown 1000 MT capacity establishment of seed processing plant and seed certification at the rate of 50% of the cost.* *- Achieve full utilization of seed storage and processing capacity, humidity control in warehouses. Provision of mobile seed dryer,*

		seed testing labs in all districts. *- Propogate new and popular varieties by supporting seed production by Bihar state seeds corporation, private seed production companies and entrepreneurs. Strengthen the network for distribution and marketing of seeds.* *Mechanization:* *- Preparation of special program with suitable packages of farm machines for small and marginal farmers is immediately required. Machinery package without tractor (using small engines) for 4 agricultural operations will be provided at low cost for farmers who are not interested in custom hiring.* *- Skill development must be provided to operators, drivers and mechanics who handle agricultural equipments. Package of machineries for the cultivation of paddy, pulses and maize will be given priority.* *- Scheme to promote a local agriculture equipment manufacturers will be formulated. Agriculture equipment manufacturers will be made partners for conducting training and demonstrations.* *Extension:* *-The road map envisions including extension activities taking cognisance of global challenges such as climate change, sustainable*

		farming and quality production. Recommendations are made for 3 kinds of extension - human-to-human, human-to-information system and information system-to-information system.Structural reorganization of extenson system will be undertaken and project implementation system will be developed to execute projects *- Knowledge of agro climatic zones, need-based techniques, recommended practices and modern technologies to be extended through - (a) exposure visit/farmer training, (b) farmer field school, (c) farmer fair, (d) mobile extension service (Beej Vahan - Vikas Vahan, exhibition van, soil testing labs, Kisan Gyan Rath), (e) use of low cost secure digital cards for dissemination of videos, (f) real time outdoor broadcasting and video conferencing, (g) Kisan Call Centre, (h) publication of magazines/success stories and bulletins, (i) strengthening of e-kisan bhavan* *- Kishan Chaupal-Ghosthi organise every Saturday in the local community to connect research universities to farmer, provide scientific and administrative information related to crops, gather information on problems and policy issues and set policy priorities* *Organic farming:* *- Extension of Organic Farming Incentive Scheme with emphasis on (1) Establishment of Organic orridor on either side of the Ganges,*

	(2) Agricultural Input Subsidy, (3) Subsidy for pre-fabricated vermi-compost unit, (4) Set up of Model Organic Village in each district *- Seed Treatment Campaign will be started for treating the home saved seeds of the farmers for use and a seed drum will be provided in each Panchayat*
3. Biofortification	*'-Promotion of nutrient rich varieties of crops like Dhanshakti variety of Bajra (high iron content) in view of climate change programmes will be formulated to promote soyabean, rajma, jowar, Bajra and barley crops in the state.* *- As a part of the focus on maize, production and value chain development emphasis will be given to Quality Protein Maize*
4. Agricultural Value Chains	*'- It is envisioned to increase processing capacity upto 30 % and to reduce wastage to 5% by 2022. Specific strategies defined for rice, maize, wheat, sugarcane and perishables like fruits, vegetables, meat, fish and poultry.* *- Develop competitive, effective and transparent marketing system by linking more and more intra and inter state mandis so that farmers get fair value for their produce. Display price comparison on a website.* *- Modernise market premises. Strengthen storage capacity as per the market need and specificity. Build large scale godowns and silos*

		for storage of prominent food crops *- Develop and strengthen region-specific supply chain infrastructure and linkage, regional capacity building centres for building capacities of unskilled labour force to tap the emerging employment potential from the food processing industry nationally and locally* *- Help establish integrated food zones/mega food parks in the selected clusters* *- Farmer groups promoted under the government scheme will be given access to market yards and will be linked with aggregators and modern marketing service providers. Extension support will be provided and revolving fund will be created to make them self-reliant and to improve collective marketing* *- Employment Centric Skill Development Training to be provied to rural youth to create employment opportunities, finance self-employment and small agri-enterprises* *- Pursue skill development, entrepreneurship, investment, institutional development to identify potential Economic Clusters or producers, processors and service providers and move them up the value chain* *- Create a market development fund for promotion of state products* *- Farmers will be provided Organic Certification free of cost by*

NON-CORE DOMAINS		*Bihar State Seed and Organic Certification Agency (BSSOCA)* *- Focus on maize: Bihar is the pioneer in Rabi maize and Quality Protein maize varieties. However, there are no processing facilities worth the name to complete the supply chain of maize. Most of the maize goes out of the state for milling and maize based product manufactured outside the state. to improve production of animal feed, corn oil, corn-starch, bio-fuel and value added table products, establish cluster-based interventions, rural warehousing facilities, processing units.*
	6. Nutrition Education and Behaviour Change Communication	*'- Encourage focused behaviour change communication efforts to improve new born and childcare practices at the household and community level* *- Ensure availability of essential services, supports and provisions for nutritive attainment in a life cycle approach, including infant and young child feeding practices, special focus on adolescent girls and other vulnerable groups, and special measures for the health, care and nutrition, including nutrition education, of expectant and nursing mothers* *- Wider public awareness will be created about importance of fisheries and aquaculture, consumption of fish as a wholesome*

	health food through mass media and publicity campaigns so as to increase fish consumption.
7. Women's Empowerment	*'- The road map recognises the role of women in agriculture, as producers of crop and animal resources, users of technology, participants in the value chain - especially in processing, food storage and marketing, and as agricultural labourers. Appropriate structural, functional and institutional measures will be initiated to empower women, provide access to credit and technologies.* *- Promote participation of women in agriculture by identify women friendly agricultural equipments and creating appropriate subsidy package for small machinery* *- Implement programmes for women's empowerment in animal husbandry. Thrust on organization of all-women dairy cooperatives. Women SHGs would be trained and financially supported for value addition of fish and their marketing.*
8. Natural Resource Management	*''- Implement the Disaster Risk Reduction Road map (2015-30) commitments* *- Natural Resource Management Programme: Construction of*

		essential infrastructure - check dams, wells, structures for moisture protection, recharge of ground water, water storage, prevention of water wastage *- Promotion of agro forestry/social forestry through afforestation, planting of fruit trees and dryland forestry to protect the environment and to increase rainfall. Construct of various essential structures to prevent land erosion and encouragement of sustainable crop rotation.* *- Promotion of organic farming in fruits and vegetables will get priority for protecting the environment, human and animal health. Emphasis given on training of farmers for organic farming and provision of subsidy under organic farming Incentive Scheme for commercial vermi compost production and distribution, Gobar Gas production, Commercial Bio-Fertilizer production, Use of Pheromone Trap and Bio-Pesticide* *- Integrated development of the entire potential of major, medium and minor water resources. Adopt rain water harvesting, ground water recharge techniques, sprinkler and drip irrigation systems, deep private tubewells, command area development and water management program* *- Increase in ultimate irrigation potential of the state by enhancing*

		the water use efficiency by adopting participatory irrigation management and other techniques. *- Micro irrigation will be pursued to improved productivity, quality of produce, and reduce production costs. Additional subsidy will be provided from State Plan to extend total subsidy of 75% to all categories of farmers.* *-Effective interaction between officials of water resources department (service provider) beneficiary farmers (stake holders) and consumers and officials of agriculture department (facilitators) for achieving the optimum agricultural productivity and production.* *- Establish soil testing laboratories at block level along with E Kisan Bhavan operated in relevant cases on PPP mode. Emphasis given on the IT enabled GPS based sampling collection, online report, preparation of digital fertility map and availability of online soil health card.*

Part B of Review of Policy Agenda: AGENDA STATEMENTS EXTRACTED FROM LISTED SOURCES* - FOR MAJOR NUTRITIOUS CROPS/LIVESTOCK (IN CORE DOMAINS)

	Legumes	Nutri-cereals/Millets	Horticulture	Livestock and poultry	Aquaculture
1. Agricultural Production	*- '-Special pulses production programme: Rate of subsidy will be fixed at 50 % of the actual price of the seed, and production seed will be further subsidized so that the farmers will be interested in production of pulse seeds* *- Integrate and build crop wise development strategy for pulses (cereals and oilseeds as well)*	-	*'- Bring purview of all projects under Bihar Horticulture Mission* *- Provide special assistance to bring public and private sector nurseries to the standard level of accreditation to ensure the production, supply and availability of quality planting material* *- Promotion and the establishment of*	*''- Transforming traditional livestock farming to modern husbandry techniques by mainstreaming best practices based on sound scientific principles and visible farmers participated result demonstrations.* *- Diversification of livestock farming with due consideration to farmers' capacity, needs and local conditions* *Breeding:*	*'- The policy recognizes this unique property regime of flood-plains and envisages co-operative / collective management of these water bodies wherein crop cultivation is integrated with fisheries (crop cultivation under individual management while*

	to promote - timely sowing, use of certified/short duration/hybrid seed, seed treatment, use of seed drill, insect and pest management, use of bio-insecticides		*high density new orchards. Conservation and area expansion of the premium varieties, good agricultural practices for the production of organic litchi, mango and guava. Rejuvenation of orchards under the Save Orchard Campaign to increase the productivity - Adoption and development of integrated nutrient management,*	*- Breeding Policy: Cluster-wise recommendations based on resource capacity, of breeds to be promoted is specified. Farmers should be involved in all crucial decisions in implementing breeding policy. Ensure timely supply of quality inputs. A statutory regulatory authority should be established to monitory quality of breeding inputs, authorize the use of inputs from other states, regulate AI*	*fish culture under collective management). Thus this policy visualizes cluster development of water logged areas for food and employment without altering the nature of the ecosystem. Demonstration of the possibility and profitability of aquaculture in chaurs through pilot scale intervention, encouraging the involvement of*

			irrigation, insect pests and disease management, protected cultivation, pre-cooling and other cutting edge techniques *- Increase the production of edible/medicinal mushroom to improve nutritional level of poor farmers. Organize mushroom farmers, especially women farmers into groups, provide them training at agricultural*	*technicians, enforce appropriate breeding policy and undertake periodic review of the policy.* *- Emphasis given on increasing milk production capacity through cross-breeding/upgradation, conservation of native draft breeds. Encouragement of breeding activity by giving training to the youths. Strengthen institutions for artificial insemination, quality semen production, cattle and poultry feed*	*NGOs for mobilising and organising the farmers, motivation and training to farmers, facilitating different models of contractual farming arrangements, mobilising inputs, credit and marketing support under different schemes shall be the major thrust areas to achieve an average productivity of 500*

			universities and link to markets. *- Promote the cultivation of region-specific and less prevalent horticulture (eg. Makhana, which has nutritional properties, Bael, Jamun, Ber, Sharifa and Amla) that can have commercial significance*	*mill and feed testing labs.* *- Implement artificial insemination protocol to improve breeds and productivity. Target of artificial insemination will be achieved through outsourcing.* *- Focus on the Breed improvement with the participation of the reputed institutions including COMFED, under the Cattle and Buffalo breeding program.* *- Bihar Livestock Development Agency to be strengthened and made as the*	*to 700 kg/year/ha.* *'- Enhancing aquaculture production and productivity by promoting decentralized fish seed production, establishing quality brood banks and fish seed certification, promoting feed mills, promoting sustainable intensive diversification in ponds and tanks through improved technologies,*

				nodal agency for the implementation of the Breeding Policy. *Feed/Fodder:* *- Scheme of fodder production and demonstration: Fodder production trials will be conducted at block level departmental nursery, information about new varieties of fodder will be provided to livestock rearers, expansion of demo plots.* *- Provide certified and foundation seed for the production of green fodder, set up*	*popularizing technologies through demonstrations, progressive farmers and participatory extension, improving availability of credit.* *- All types of water bodies (ponds) below 10 ha in size shall be brought under improved scientific composite fish culture and achieve an annual average*

				animal feed factories in the areas where milk federation exist, set up fodder storage houses in order to ensure the uninterrupted supply of animal feed to all producers *Livestock health:* *- Livestock health protection program: 2634.05 lakh vacinations to be completed in the roaf map period (2017-2022) animals every year to protect against infectious diseases like HS, BQ, FMD, PPR,*	*productivity of 3000 - 5000 kg / ha. This is to be made possible by restoration and renovation of existing water bodies, creation of new water bodies* *- Modernize traditional aquaculture by mainstreaming best practices, participatory extension led by visible farmers, developing unutilized fisheries resources (eg. ox-bow lakes and*

				Brucellosis etc. *Vaccination campaign will be conducted every year under the Pashu Swasthya Raksha Pakhwara* *- Strengthen veterinary services like the reporting system, availability of fuel, maintenance, drivers honorarium, medicines etc.* *Cattle:* *- Scheme for Development of Goshala: Develop existing gaushalas as Model Ghausala for the conservation and promotion of*	*"chaurs"), ensuring year-round availability of seed* *- Community participated management of the ox-bow lakes by active involvement of local fishing / farming communities.* *Cluster development approach is to be adopted to ensure easy and round the year availability of adequate and quality fish seed.* *- Leasing and*

				indigenous breeds, modernization and development of infrastructure, setting up of gobar gas plant, production of vermi compost, fodder production center etc. *Poultry:* *- Ensure year round availability of quality day-old-chicks at local level by establishing hatcheries in potential areas and promotion of layer poultry farms in the vicinity. Set up the layer poultry farms in the private sector for the*	*management of reservoirs and public water bodies to improve productivity* *- Encouraging riverine fisheries on a conservation-based regulatory approach, conserve aquatic bio-diversity* *- Diversification of aquaculture with due consideration to farmers' capacity, needs and local conditions* *- Enact schemes to construct fish seed*

				commercial production of eggs to improve per capita availability of eggs *- Distribution program of low-input species of chicks to vulnerable sections of society (BPL families) to provide employment and improve availability of meat and eggs* *- Conservation, research and development of indigenous chickens and low input species of poultry* *Small livestock:* *- Establish Goat farm*	*hatchery, new ponds and pens, fish feed mills, market outlets, cold-storage cum ice-plant, to establish cold chains and improve fish feed distribution* *- Building adaptive capacity of fisherman/small farmers to mitigate & contain the impact of natural disasters and climate change*

				(20+1 capacity and 40+2 capacity) in the private sector/scheme of goat distribution on a large scale to increase the availability of meat *- Training and promotion of Small Ruminants Resource Persons* *- Under Goat Distribution Programme, BPL families will be given three breedable goats (one unit) free of cost through Bihar Rural Livelihood Promotion Committee* *Extension:*	

				- Empowerment of farmers through on-site training and exposure visits, farmer-led result demonstrations at Panchayat level on modern animal husbandry practices, grooming farmers as extension volunteers , creating a participatory learning environment and encouraging farmer innovation	
2. Biofortification	-	-	-	*NA*	*NA*
3. Agricultural Value Chains	*'- Provide focused attention on processing of pulses. It is envisaged that a*	-	*'- Farmers shall be organised for marketing and will be tied up with the*	*"-Establishing cooperative structure for cattle, goatery and poultry products.*	*'- Establish modern fish processing units in the selected clusters.*

	collaborative mechanism of modern milling facilities of pulses and establishment of appropriate modified atmosphere storage facilities be created to give a fillip to the pulse processing in the state. *- Provide special assistance for mini dal mill (as well as rice and oil) & other agricultural equipments related to processing reduce post harvest losses-*		*aggregator and modern market service providers. Along the pattern of the milk federation, a similar fruit and vegetable federation shall be constituted.* *- Integrated Value Chain shall be developed for development of modern market for fruits and vegetables. Primary processing facility such as cleaning, sorting and grading will be created at the*	*- Establish modern abattoirs, upgrade existing slaughterhouses* *- Backward and forward linkages will be established between broiler farms and private sector integrators* *- Development of farmer processor linkages is the key element envisaged to ensure rearing of disease free birds/animals and creation of requisite cold chain and reefer vans for the sale of safe, hygienic and*	*Facilitate setting up of 2 integrated aqua food park in two districts with integrated fishing, packaging preservation and storage. Create additional 50 ice factories and cold storages along the supply chain with reefer vans, etc.* *- Establishing network of professionally managed hygienic and modern retail outlets at district headquarters and state capital by*

			village level and at the farmers group level. *- Create basic infrastructure to promote post-harvest management of horticultural crops, construction of low cost storage units, development of cool chain for marketing. Pursue cluster-based development of horticulture* *- Market shall be developed at different levels. At the village level,*	*quality meat products to consumers.* *Dairy:* *- Dairy vision of the task force: expansion of cooperative society network, breed and infrastructure development, human capital development for farmers, processing and preservation of milk, market development. Meet total milk requirement of state as per recommendations of ICMR.* *- Establishment of milk producing*	*involving fisheries professionals and developing their entrepreneurship skills.*

			the rural haats shall be modernised. Hub and Spoke based Terminal market and Integrated Value Chain shall be developed. The commercial farming may be regulated as and when it is required.	*cooperatives and expansion of coverage to all milk producers - Set up new milk processing plants and renovate old plants to improve processing capacity, set up bulk coolers and powder plants to tackle seasonal fluctuation in milk production, set up milk marketing centre with the participation of private and cooperative sectors - Samagra Gavya Vikas Yojana: loan-cum-subsidy to dairy businesses generating*	

				employment for farmers and youth *- Diary Entrepreneurship Development Scheme: Loan cum subsidy scheme to promote dairy units, heifer farms, milch cattle units with vermi compost, purchase of bulk cooler/milking machine, dairy transport system and cold chain arrangements, marketing centre. SC/STs given special allocation*	

***See *References – Agenda documents* for list of sources**

APPENDIX B

COMPRENHENSIVE LIST OF POLICIES AND SOURCES: BIHAR

Sl. No:	Details	Source	Domain
1.	Scheme for integrated development of food processing sector	Task Force of Agricultural Development	Value Chains
2.	Food parks scheme	Task Force of Agricultural Development	Value Chains
3.	Cold Storage policy	Task Force of Agricultural Development	Value Chains
4.	Agricultural mechanization melas	Krishi Road map 2017-2022	Production
5.	Sub-mission on agricultural mechanization	Krishi Road map 2017-2022	Production
6.	Agricultural mechanization scheme	Krishi Road map 2017-2022	Production
7.	Garden Development Scheme (Special Component for SC/(Tribal Area Sub Plan))	Budget 2018-19	FSN
8.	Seed Testing Laboratory	Budget 2018-19	Production
9.	Seed Multiplication Farm	Budget 2018-19	Production
10.	Integrated village seed program: Chosen villages within chosen districts will be provided 60% subsidy for oilseeds and pulses, 50% for other crops for 5 years for seed production	Krishi Dept Website	Production
11.	Expansion of area under seeds: Allocation of funds for production of seeds for *Kharif* season crops according to agro climatic zone	Krishi Dept Website	Production
12.	Seed production program -Special Component	Krishi Dept Website	Production

	for SC/(Tribal Area Sub Plan)		
13.	Strengthening Bihar State Seed Corporation	Krishi Dept Website	Production
14.	Seed Village Scheme: Started in 2007-08. Distribution of certified seed at 50% subsidy for paddy and wheat and 60% for oilseeds. Training provided to farmers in 3 stages - before sowing, in the middle of the cropping season and before harvest. 100 farmers from each village will be selected to grow the foundation seed of selected crops on 1 acre of land and will be provided subsidy on inputs.	Krishi Dept Website	Production
15.	Distribution of seeds at subsidized rates: Subsidy provided for the production of certified paddy and wheat seed and oilseeds on village land for 10 and 15 years respectively	Krishi Dept Website	Production
16.	Paddy minikit scheme - Chosen farmers will receive 80% subsidy for the field experimentation of paddy varieties according to climatic conditions	Krishi Dept Website	Production
17.	Assistance to Bihar State Seeds and Organic Certification Agency	Krishi Dept Website	Production
18.	Organic Farming Incentive Scheme: Establishment of organic corridor, formation and provision of subsidy package, inputs, certification and market linkages to farmer groups, encourage formation of all-organic clusters, provision of vermi-compost and gobar gas and other inputs, model organic village, subsidy for commercial vermi-compost unit, encouragement of moong and cover crops for mulching, subsidy on micro-nutrients in areas of low fertility, integrated pest management	Budget 2018-19	Production

19.	Upgradation of Organic Farming -Special Component for SC/(Tribal Area Sub Plan)	Krishi Dept Website	Production
20.	Development of community nursery for paddy	Krishi Dept Website	Production
21.	Establishment of Agricultural Mechanization Bank for financing custom hiring operations	Krishi Dept Website	Production
22.	Agricultural Mechanization under Krishi Road Map	Krishi Dept Website	Production
23.	Establishment of e-Kisan Bhawan in each block	Krishi Dept Website	Production
24.	Kisan Salahkar Yojana: To provide agricultural extension and information about government schemes	Krishi Dept Website	Production
25.	Distribution of subsidized metal kothila	Krishi Dept Website	Production
26.	Promotion of Agricultural Mechanization: 69 types of equipments have been shortlisted for subsidy, subsidy on machines from authorized dealers offered at Mechanization Melas, online registration and distribution of subsidy	Budget 2018-19	Production
27.	Incentives in Agricultural Innovation	Budget 2018-19	Production
28.	Strenghthening of Soil Seed and Fertilizer Laboratory (Research)	Budget 2018-19	Production
29.	State Plan of Diara/floodplain Development: Subsidised provision of hybrid seeds for selected vegetables (nenua, karela, pumpkin, peas) and bore well	Krishi Dept Website	Production
30.	Incentive plan for organic manure	Krishi Dept Website	Production
31.	Chief Minister Horticulture Mission	Krishi Dept Website	Production
32.	Chief Minister Rapid expansion program	Krishi Dept Website	Production
33.	NFSM	Krishi Dept Website	Production
34.	NMOOP	Krishi Dept Website	Production
35.	NMSA	Krishi Dept Website	Production
36.	RKVY	Krishi Dept Website	Production

37.	Sub Mission on Agricultural Extension	Krishi Dept Website	Production
38.	National e-governance plan for agriculture	Krishi Dept Website	Production
39.	Sub Mission on Agricultural Mechanization	Krishi Dept Website	Production
40.	National Food Security Mission (Food Grains) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
41.	Sub Mission on Seed & Planting Material (Seed) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
42.	Conventional Agriculture Development Scheme (Agriculture Forum) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
43.	National Sustainable Agriculture Mission (Fertilizer) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
44.	National Oilseeds and Oil Palm Mission (Commercial Crops) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
45.	National Agriculture Development Scheme (Extension and Training of Farmers) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
46.	National Agricultural Extension and Technology Mission (Extension and Training of Farmers) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
47.	National Horticulture Mission (Horticulture and Vegetable Crops) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
48.	Skill Development Mission (Education) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Production
49.	National Micro Irrigation Mission Plan	Krishi Dept Website	Production

50.	National Medicinal Plant Mission Program	Krishi Dept Website	Production
51.	Horticulture special programs	Krishi Dept Website	Production
52.	ISOPOM	Krishi Dept Website	Production
53.	National Bamboo Mission	Krishi Dept Website	Production
54.	Intermediate crop scheme in old orchards (Under National Agriculture Development Scheme)	Krishi Dept Website	Production
55.	Gardening programs in arid areas (Under National Agriculture Development Scheme)	Krishi Dept Website	Production
56.	National Vegetable Development Program for Urban Areas (Under National Agriculture Development Scheme)	Krishi Dept Website	Production
57.	National Agriculture Development Scheme	Krishi Dept Website	Production
58.	Animal Breeding Farm (Animal and Buffalo Development)	Budget 2018-19	Production
59.	Animal Breeding and Development Project (Animal and Buffalo Development)	Budget 2018-19	Production
60.	Cattle fair and exhibition and animal welfare	Budget 2018-19	Production
61.	Range Poultry Farm and Central Poultry Development and Poultry Farm Production and Distribution Plan (Poultry Development)	Budget 2018-19	Production
62.	Fisheries Development Agency (Inland Fish Farming)	Budget 2018-19	Production
63.	Fisheries Research Scheme	Budget 2018-19	Production
64.	Frozen Semen Bank	Budget 2018-19	Production
65.	Cowshed Development Scheme	Budget 2018-19	Production
66.	Development of Pigs (Pig Farm Development)	Budget 2018-19	Production
67.	Backyard Goat Rearing Scheme (Special components for SC category)/(Tribal Area Sub Plan)	Budget 2018-19	FSN
68.	Backyard Hen Rearing Scheme (Special components for SC Category)/(Tribal Area	Budget 2018-19	FSN

	Sub Plan)		
69.	Livestock Development Plan	Budget 2018-19	Production
70.	Extension of Fishery (Directing and Administration)	Budget 2018-19	Production
71.	Development of Mind Fisheries (Inland Fish Farming)	Budget 2018-19	Production
72.	Restoration and Development of Pond fisheries (Inland Fish Farming)	Budget 2018-19	Production
73.	Fisher'smen Help (Special components for SC category)/(Tribal Area Sub Plan)	Budget 2018-19	Production
74.	Veterinary services and animal health plans	Animal Husbandry Dept. Website	Production
75.	Cattle Development Scheme	Animal Husbandry Dept. Website	Production
76.	Integrated Poultry development scheme	Animal Husbandry Dept. Website	Production
77.	Integrated Goat and Sheep development scheme	Animal Husbandry Dept. Website	Production
78.	Planning to estimate milk, egg, meat and wool production under Integrated Monitoring Survey	Animal Husbandry Dept Website	Production
79.	National Livestock Health and Disease Control Program (Other Livestock Development) (Special components for SC category)/(Tribal Area Sub Plan)	Budget 2018-19	Production
80.	Naional Livestock Management (Special components for SC category)/(Tribal Area Sub Plan)	Budget 2018-19	Production
81.	Blue Revolution-Integrated development and management of fisheries (Inland Fish Farming)	Budget 2018-19	Production
82.	RKVY: Scheme on National Mission for Protein Supplement	Budget 2018-19	Production

83.	Soil Testing and Quality Control Laboratory Scheme	Budget 2018-19	NRM
84.	Promotion of zero-tillage wheat	Krishi Dept Website	NRM
85.	River Linking Projects (TAAL Development) State Scheme: Develop training centres in watershed areas to empower farmers	Krishi Dept Website	NRM
86.	Flood Relief Emergency Plan	Budget 2018-19	NRM
87.	Intensified Field Development and Training Support Scheme	Budget 2018-19	NRM
88.	Agri Business Development Project (External Funded Scheme) -Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	Value Chains
89.	Flood Relief Emergency Plan -Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	NRM
90.	Land Conservation Work (Soil Conservation)	Budget 2018-19	NRM
91.	Land Conservation Work for SC/ST under special component plan	Budget 2018-19	NRM
92.	PMKSY	Budget 2018-19	NRM
93.	Prime Minister Agriculture Irrigation Scheme (Extension and Training of Farmers) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	NRM
94.	Integrated water Resources Management Program (Soil Conservation) Special Component for SC/(Tribal Area Sub Plan)	Budget 2018-19	NRM
95.	Bihar Skill Development Scheme (Special components for SC category)/(Tribal Area Sub Plan)	Budget 2018-19	Value Chains
96.	National Agriculture Development Scheme (Dairy Development Project/Assistance to co-operatives and other bodies): Establishment of Bulk Milk Cooler, Planning of Liquid Nitrogen Transports Tanker Purchase, Establishment of	Budget 2018-19	value chains

	Automatic Milk Storage Center		
97.	National Dairy Development Scheme	Budget 2018-19	value chains
98.	Mukhyamantri Nari Shakti Yojana for women, Bihar	Budget 2018-19	Women's empowerment
99.	Laxmi Bai Social Security Pension Scheme for widowed women pension,financial assistance	Budget 2018-19	Women's empowerment
100.	Mukhyamantri Kanya Suraksha Yojana for girls of BPL, Bihar financial assistance	Budget 2018-19	Women's empowerment
101.	Rural Dairy Employment Scheme (Special components for SC Category)/(Tribal Area Sub Plan)	Budget 2018-19	value chains
102.	Kosi Basin Development Project (World Bank aided)	Krishi Dept Website	FSN, NRM
103.	Scheme for integrated development of food processing sector	Krishi Dept Website	Value Chains
104.	Food parks scheme	Krishi Dept Website	Value Chains
105.	Cold Storage policy	Krishi Dept Website	Value Chains
106.	ICDS	Budget 2018-19	Nutrition BCC
107.	Sabla	Budget 2018-19	Women’s empowerment
108.	IGMSY/PMMVY	Budget 2018-19	Women’s empowerment

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