National Pathways for Food Systems Transformation in Pakistan
(A Strategic National Pathway Document)

Ministry of National Food Security and Research (MNFSR)

1. Country Background

Safe and nutritious food is a pre-requisite for health. Sustainable Development Goal-2 (SDG-2) intends to end hunger, by achieving universal food security and improved nutrition by developing sustainable agriculture. Currently, above 215 million people dwells in Pakistan. This population size shall increase to 253 million by 2030; grow to nearly 290 million by 2040 and may further reach about the figure of 350 million by 2050. At national level, nearly 70 million tons of cooked/prepared food is annually needed to feed current population. This demand shall rise to 130 million tons by 2050 (Farooq, 2015[1]). In commodity form, the total required agricultural production is about 160 million tons; which shall increase to nearly 296 million tons by 2050. Data[2] for the year 2018-19 reflects that 18.38 percent households are undernourished in Pakistan and this situation is worse in urban areas (23.43%) compared with rural areas (16.61%).

According to Pakistan's latest National Nutrition Survey (2018), 40% of children aged below five years are stunted, 17.7% are wasted, 28.9% are underweight and 9.5% are overweight. The stunting, wasting and underweight prevalence is relatively more in rural areas than the urban. The prevalence of micro-nutrient deficiencies like vitamin-D, anemia, vitamin-A, iron, folic acid, calcium, iron deficiency anemia, vitamin-B12 and Zinc are prevailing at 62.7%, 53.7%, 51.5%, 49.8%, 34.9%, 32.2%, 28.6%, 25.1% and 18.6%, respectively. Data on Pakistani adolescents (10-19 years) reflects that >21% boys are underweight, 31.7 are short-statured, 17.8% are overweight and 7.6% are obese. Among girls, the corresponding figures are like 11.8% are underweight, 28.5 are short-statured, 16.8% are overweight and 5.5% are obese (Government of Pakistan, 2019[3]).

Considering women of reproductive age (WRAs) (i.e. 15-49 years), 14.5% are underweight, 24.2% are overweight and 13.9% are obese. The overweight and obesity prevalence are relatively higher in urban than rural areas, while for underweight, opposite prevails. Sindh, Baluchistan and AJK have more undernourished women while overweight and obesity are more pronounced in ICT, KP and KP-NMD. Secondly, the prevalence of micro-nutrient deficiencies like vitamin A, B12 & D and minerals like Iron, Zinc and Folic Acid along with anemia, iron deficiency anemia are also quite high. These deficiencies in decreasing order are 79.7% followed by 44.5%, 42.6%, 34.3%, 27.0%, 26.5%, 22.1%, 20.3% and 18.2%, respectively for vitamin-D deficiency followed by folic acid deficiency, anemia, iron deficiency, vitamin-A deficiency, Calcium deficiency, Zinc deficiency, vitamin B12 deficiency and iron deficiency anemia (Government of Pakistan, 2019).

The causal factors to malnutrition in Pakistan are numerous and varied. However, the major underlying factors include both limitations in households' access and affordability to healthy and nutritious foods, the food habits (or tastes and preferences), urbanization and globalization influence in food consumption patterns, which collective shape the food purchasing and preparation practices. The production systems based agricultural and value chains development approach offers win-win opportunities for tackling the problem of malnutrition through food approach as it is more universal than the medical or taking various supplements.

---

[1] Farooq, U. 2015). Food Demand-Supply and Gaps Projections for Pakistan: Potentials and Constraints. Background Paper Written for the Vision-2050 "*Addressing Challenges to the Agriculture Sector in Pakistan*", (Draft).

[2] An Analysis of Food Insecurity in Pakistan: Prevalence of Undernourishment (PoU) and Food Insecurity Experience Scale (FIES)

[3] Government of Pakistan (2019). National Nutrition Survey, 2018. Nutrition Wing, Ministry of National Health Services, Regulation and Coordination, Government of Pakistan, Islamabad.

2. Purpose of Adopting Food Systems Approach

Food systems are crucial for addressing problems of food insecurity, malnutrition, and diet-related health problems. Adequate nourishment in terms of quantity and quality is necessary for healthy living life. The uncompromising primary responsibility of Pakistan agriculture is to provide healthy, safe & nutritious food for the growing population, feed & fodder for livestock, fiber and other cash crops for manufacturing and industry, and ensuring modest export surpluses.. Managing future food and fiber security is more challenging than before in view of quantity and quality of natural resource base and climate change and other vulnerabilities, shocks and stresses.

A set of challenges is identified, which are directly and indirectly pertained to sustained access to safe and nutritious food for all.

i. Un-optimized allocation of land and other resources and hesitation to shift from cereals dominated cropping patterns to diversified cropping systems by using latest technologies;
ii. Increasing consumers' access to diversified food for nutritional improvement of the society;
iii. Enhancing availability of fresh fruits and vegetables to the dwellers of deep rural areas as they pay relatively higher prices compared to urban consumers with compromising on freshness also;
iv. Introduction of food preservation and processing methods for controlling food loss and wastage;
v. Involvement of SMEs for adopting due food safety and maintaining nutritional quality;
vi. Awareness and advocacy for healthy diet in population in different age groups.
vii. Creating convincible awareness among food chain actors about food safety and its laws, and ensuring provision of safe food to the consumers.

The Action Plan for Pakistan's Sustainable Food Production Systems has four main objectives:

i. Create a modern, efficient and diversified agriculture by adopting sustainable agriculture practices, technologies for sustainable production system and to meet food security;
ii. educe post-harvest losses and wastages of crop-livestock commodities from their production points to their (their products) final consumption;
iii. Increase and ensure protection and preservation of prime agricultural land and combat Desertification and Drought; and,
iv. Adoption of climate resilient techniques and measures for ensuring sustained food security.

The plan emphasizes on the shift towards more sustainable food system all along the food value chain. For improving agriculture and food security, Pakistan requires strategic planning that ensures fundamental changes in the ways food is produced, processed, transported and consumed. There is a need for developing and implementing agriculture and food security policies, strategies and capacity building through training programs for ensuring sustainable food system.

3. Action Tracks for Developing/Formulating Food Systems

At the Ministerial level, the preparatory work on the UNFSS-2021 began with the 1st meeting held at MNFSR on February 16th 2021 in consultation with FAO, IFAD, GAIN and various line departments of the Ministry has attended the meeting. MNFSR decided to establish a UNFSS-2021 Secretariat for Pakistan at 5th floor of PARC under the direct supervision of Chairman PARC.

Five working papers – one on each Action Track - were drafted at UNFSS-2021 Secretariat for Pakistan in collaboration of various experts from PARC and provincial agricultural R&D. Later on, National and Provincial dialogues process began to obtain feedback from national and international experts in research, academia and development institutions. UNFSS Pakistan secretariate led by

Chairman PARC convened series of national, sub-national & independent dialogues. After the round of National/Provincial dialogues, the draft working papers were shared with the heads of various institutions in the country. The feedback from the national and provincial dialogues and comments of various experts were incorporated for finalizing a working paper on each Action Track.

4. Short & medium term food production expectations

Future food demand projections clearly show that the demand for various food products shall continue to rise, even if population growth is brought down. This is because the future couples of the current population shall contribute more in keeping population growth rates considerably high. Keeping in view different anticipation towards reducing future population growth, the growth rates in production needed to feed the population are given in Table-1 below. It clearly shows that for food groups like food grains, future growth rates needed shall be relatively lower than the horticultural products (fruits & vegetables) and animal based products. This clearly signifies the need for diversification in the crop-livestock production patterns.

Table 1: Average growth rate in production needed to fulfill food supplies for rising population in Pak.

Period	Wheat	Rice	Other cereals	Pulses	Milk	Oils & fats	Meats	Fruits	Vegetables	Misc.	Total
2020 to 2025	1.68%	1.51%	2.12%	1.55%	2.37%	2.04%	3.83%	2.31%	1.97%	1.83%	2.05%
2025 to 2030	1.77%	1.58%	2.14%	1.58%	1.78%	2.07%	1.86%	2.32%	2.03%	1.88%	1.86%
2030 to 2035	1.53%	1.42%	2.07%	1.41%	2.21%	1.89%	3.51%	2.15%	1.79%	1.71%	1.91%
2035 to 2040	1.63%	1.46%	2.00%	1.45%	1.65%	1.93%	1.73%	2.18%	1.87%	1.76%	1.72%
2040 to 2045	1.50%	1.41%	1.90%	0.79%	2.15%	1.84%	3.31%	2.10%	1.79%	1.68%	1.86%
2045 to 2050	1.59%	1.46%	1.96%	1.60%	1.61%	1.89%	1.70%	2.14%	1.83%	1.74%	1.69%

Source: growth rates estimation made from future food demand projection by Farooq, 2015b.

The agricultural resource base of the country is consisted of 23 million ha of cultivable land, 45 million ha of rangelands, 1000 Km of costal line with 3 big dams, more than 100 small dams, 19 barrages having a 57000 km canals. Pakistan is blessed with diversified agro-ecologies and production systems. The ecologies of KP and Northern Areas range from semi-arid to humid. The Sindh province is primarily arid, while Punjab and Baluchistan having arid to semi-arid ratios as 58% to 42% and 43% to 57%, respectively. By ecologies, 51.5% of total areas is arid, 36.9% is semi-arid, 5.4% is sub-humid and 6.2% is mixed. These ecologies suit to the production of nearly 100 field and horticultural crops --- more than 30 including 5 major & 25 minor crops, 30 vegetables, nearly 30 fruits, 5 condiments and numerous medicinal herbs. Thus, Pakistan has the potential to become food surplus country in short span of time while using available rich natural resource effectively by adopting modern agricultural production practices.

More specifically, in the short run, there is a strong need to promote food systems-based value chains in the fruits, vegetables and livestock products along with controlling post-harvest losses and wastages. The northern areas of the country and Baluchistan province are significant producer of various fruits in the country.

5. Discourse on the National Pathways

During the process delineated in Section-3, a consensus on game changing proposition is already achieved from all stakeholders who will be responsible for further implementation of the identified propositions.

Furthermore, **Under AT-1;** Pakistan has adopted a strategy to increase the level of production of diversified safe food that allow supply to overtake the projected increase in demand. Increased food supply would not only drive down the commodity prices but also increase year around sustainable supply.

Supporting own home-grown food initiatives are considered as another important proposition. Reduction in food losses both for perishable and non-perishable commodities was also given due consideration to ensure year around availability of preserved/processed food and to reduce extra burden on natural resources.

Under **Action Track-2**, sustainable consumption patterns shall be established by: Mass marketing of dietary guidelines with traditional and new recipes, adopting calorie and environmental labeling for food items, food governance & regulatory monitoring and consumer awareness campaigns on importance of taking nutritionally balanced food.

For **Action Track-3**, Pakistan intends to incentivize regenerative and organic agriculture, promoting use of resource conservation technologies and green-manuring, promoting use of bio-chemicals in crop production & protection. Promulgating organic regulations and certification procedures & laboratories for branding organic products.

Moving on to **Action Track-4**, advanced equitable livelihoods have the potential to increase on-farm and off-farm incomes and demand for industrial products. The strategy is based on increasing the bargaining power of the farmers while providing competitive marketing options. The initiatives include entrepreneurial skill development, digital formal production loans, financial services for micro, small and medium sized enterprises (MSMEs). Transforming the existing village organizations into registered legal entities, launching 'Agriculture Impact Fund' to co-invest with producer organizations in downstream value chain economic activities such as processing crop storage facilities and cold chains.

Finally, under **Action Track-5**, our plans for building resilience to vulnerabilities, shocks and stresses are in addition to the subsidized natural disaster insurance schemes and the financial instruments of Natural Disaster Risk Management Fund. The plan is to introduce agriculture parametric insurance products leading to the establishment of "Agriculture Index Insurance Pool". Further focus will be on climate resilient technologies development and conservative use of natural resources.

6. Theme-based Strategy for Collective Action

Conceptually, partnership is an arrangement in which parties agree to cooperate for their mutual interests, while coalition is a group consisting of people from different political or social groups who are cooperating to achieve a particular aim. Government of Pakistan has already expressed its high commitments to different SDGs for participating in various partnerships and coalitions on "Zero Hunger" and "Healthy Diets". The potential national and international institutional institutions and organizations that can collaborate in different partnerships and coalitions under various thematic areas are delineated in Table-2 below:

Table 2: National and International Partnership and Collaboration Institutions for Agri. R&D in Pak.

Sr. #	Thematic Areas	National and International Partnerships and Coalitions
1.	Systems based crop-livestock productivity enhancement	**International** --- All CGIAR[1] Research Centers, FAO, FCDO, ACIAR, CIDA, etc. **National-Public** --- NARS, Provincial Livestock & Dairy Development Departments/Directorates and their Sub-Institutes & Stations; Pak. Electronic Media Regulatory Authority (PEMRA); Pak. Bureau of Statistics (PBS), etc. **Academia** --- Provincial Agricultural Colleges and Universities in Pakistan. **National-Private** --- Private R&D Institutions[2]; SDPI; AKRSP; PRSP; SRSP; BRSP; NRSP.
2.	Tackling post-harvest losses and wastages	**International** --- All CGIAR[1] Research Centers, FCDO, ACIAR, GAIN etc. **National-Public** --- Food Technology Research Directorates/Sub-Directorates of Provincial Agricultural Research Institutes; Provincial Livestock & Dairy Development Departments/Directorates; Provincial Marine/Fisheries Departments/Directorates and their Sub-Stations; Food Sciences Research Institute (FSRI) of PARC at Islamabad and other relevant institutions **Academia** --- Food Technology/Sciences Departments of Provincial Agricultural Colleges and Universities in Pak. **National-Private** --- Food Products Manufacturing Companies; Local Food Business or Restaurants Assoc., etc.
3.	Dietary diversity by production diversification and nutrition awareness among consumers	**International** --- International Food Policy Research Institute (IFPRI); GAIN; NI; UN Agencies (FAO, WFP, IFAD, UNICEF, WHO), etc. **National-Public** --- Food Technology Research Directorates/Sub-Directorates of Provincial Agricultural Research Institutes; Provincial Livestock & Dairy Development Departments/Directorates/Agricultural Extension/ Marine/Fisheries Departments/ and other relevant institutions **Academia** --- Food Technology/Sciences Departments of Provincial Agri. Colleges & Universities in Pakistan. **National-Private** --- Food Products Manufacturing Companies; Local Food Business or Restaurants Associations, etc.; AKRSP, PRSP, SRSP, BRSP, NRSP
4.	Promoting responsible	**International** --- All CGIAR[1] Research Centers, ICBA at UAE; FAO, DFID, ACIAR, CIDA, etc.

	agriculture for preserving soil fertility, enhancing water-use efficiency and limiting emission of GHGs	**National-Public** --- Barani Agricultural Research Institute (BARI), Chakwal; Soil and Water Conservation Research Institute (SAWCRI), Chakwal; Soil Fertility Research Institute (SFRI), Lahore;; Pakistan Meteorological Department (PMD), Islamabad; Drainage Research Centre of Sindh Forest Department, Tandojam; Soil Survey of Pakistan, Lahor and other relevant institutions **Academia** --- Soil Science, Land & Water Related Dept. of Provincial Agri. Colleges/Universities in Pakistan. **National-Private** --- Private R&D Institutions[2]; AKRSP, PRSP, SRSP, BRSP, NRSP
5.	Systems based capacity building of stakeholders in crop-livestock value chains	**International** --- ICARDA, ICRISAT, ILRI, CIMMYT, IRRI, IWMI, CIP, CIAT, ICRAF, **National** --- Regional Agricultural Economic Development Center (RAEDC), Vehari; In-Service Agriculture Training Institutes (IATIs) of Punjab; Agriculture Training Institute, Sakrand, Sindh; Agriculture Training Institute (ATI), Peshawar; Agriculture Training Institute (ATI), Quetta; Agri. Polytechnic Institute (API),NARC.
6.	Improved food governance of supply chains	**International** --- Global Alliance for Improved Nutrition (GAIN), UN Agencies (FAO, WFP, UNICEF), etc. **National-Public** --- Provincial Governments, Provincial Food Authorities, District Administration, Market Committees
7.	Separate allocation of funds and manpower for developing climate change resilient technologies	**International** --- ICARDA, ICRISAT, ILRI, CIMMYT, IRRI, IWMI, CIP, CIAT, ICRAF, **National** --- Ministry of Climate Change, Islamabad; Ministry of Climate Change, Sindh; Ministry of Climate Change, KP; BARI Chakwal; SAWCRI Chakwal; BARDC Quetta; ARI Sariab Quetta; ARI Tarnab; **Academia** --- Climate Change Center (CCC), Agriculture University Peshawar;

7. Pakistan pathway – taking stock from existing Policy & Planning documents

Our recently launched National Food Security Policy (2018) is structured around the World recognized food security definition. This policy visualizes Pakistan to strive for "*A Food Secure Pakistan*" through "*a modern and efficient food production and distribution system that can best contribute towards food security and nutrition, in terms of availability, access, utilization and stability*" (Government of Pakistan, 2018).

The Action Plan on Sustainable Consumption and Production (SCP) for Pakistan's Sustainable Food System has four main objectives: i) create a modern, efficient and diversified agriculture by adopting Sustainable agriculture practices, technologies for sustainable production system and to meet food security; ii) reduce food waste and crop loss; iii) increase and ensure protection and preservation of prime agricultural land and combat Desertification and Drought; and, iv) adoption of climate resilient techniques and measures for ensuring food security and sustainable agriculture. The plan emphasizes on the shift towards more sustainable food system all along the food value chain. For improving agriculture and food security, Pakistan requires strategic planning that ensures fundamental changes in the ways food is produced, processed, transported and consumed. There is a need for developing and implementing agriculture and food security policies, strategies and capacity building through training programs for ensuring sustainable food system. In addition to this Pakistan Multisectoral Nutrition Strategy 2018-25 and Pakistan Adolescent Nutrition Strategy 2020-25 are few of the existing strategic documents to set the foundation of Pakistan food system transformation approach.

8. Follow-up Mechanism at National and Provincial Levels

Policymakers, practitioners, and researchers have embraced the importance of viewing food, nutrition, health, and environmental sustainability challenges through a food systems lens. This 'systems-thinking' has been aided by frameworks that better articulate the related components of a food system and how they influence a diverse set of outcomes; however, these frameworks must now be complemented by enhanced systems measurement and analysis. A data revolution will facilitate this next phase, which could begin with improved descriptive analysis, aimed at comparing food systems characteristics and outcomes across geography, income groups, food system types, and over time, using high-quality, and standardized indicators.

Considerable improvements in data availability and quality are needed to meet the challenge of monitoring and analyzing food systems, so that appropriate policies and actions are devised to improve human and planetary health with due accountability mechanisms to strengthen food systems-based governance. Formation of a "National Level Food Security Information and Early Warning System (FSIEWS)" is hereby proposed in the 1st phase as the groundwork towards the destination. Various linkages about Food Security Information and Early Warning System (FSIEWS) are outlined in Fig-1.

Figure-1:
Organogram of Proposed Food Security Information and Early Warning System (FSIEWS)