FARMING SYSTEM FOR NUTRITION:
A PATHWAY FOR ADDRESSING MALNUTRITION IN INDIA

POLICY RECOMMENDATIONS

July 2018

M S SWAMINATHAN RESEARCH FOUNDATION
CHENNAI

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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 in unacceptable levels. Stunting, wasting and underweight among children, 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 International Children's Education 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.

[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).

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).

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 oleifera*) and *Amaranthus sp*. 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).

[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).

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. 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).

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.

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/).

This booklet presents the policy recommendations for promoting farming system for nutrition approach in the four states and in the country as a whole.

ANDHRA PRADESH

Government of Andhra Pradesh has both a sound vision and policy framework to promote agricultural growth while improving climate resilience and natural resources. There is recognition of integrated farming systems, organic and natural farming and the importance of animal food products. However, there is scope to make existing primary sector policies more nutrition-sensitive and introduce supportive policies that will enable the state to improve its nutritional indicators while maintaining agricultural growth. Some recommendations to promote a farming system for nutrition approach in Andhra Pradesh are listed below:

1. **Improved nutrition must be placed as a key agenda in promoting Integrated Farming Systems (IFS):** The benefits of IFS for diet and nutrition are not suitably recognised and the advantages of this system are seen only in terms of risk mitigation, climate resilience and incomes. Vision documents can incorporate improved nutrition as an explicit objective of IFS. Guidelines for IFS that introduce crop rotations, intercropping and animal/fish rearing can address location specific IFS designs to address particular nutritional needs of the area.

2. **A Road Map for promotion of biofortified cereals is necessary:** There is a conspicuous absence in long term and short term policy documents of a plan to improve the adoption of biofortified varieties of rice, pearl millet and sweet potato. Promotion of Dhanshakti- the high-iron rich pearl millet- released in 2014 and DRR Dhan 45 - a high-zinc rice variety- released in 2016 have the potential to address micronutrient malnutrition among the rice/millet growing farm households. The experience of districts where DRR Dhan was introduced as a pilot may be studied to assess feasibility for scale up.

3. **Production and processing strategies to increase the availability of pulses, millets, vegetables and fruits in local rural markets to be formulated:** The Comprehensive Revival of Millets programme providesa holistic development plan for improving the productivity and production of millets in 7 districts of Andhra Pradesh. This programme supplements other state initiatives to improve processing and marketing of value-added millet based products aimed at improving farmer income, market availability and consumption. Similar initiatives that target the entire value chain can also be implemented for pulses. It is necessary to formulate production strategies that include improving availability of quality seeds/planting material for non-commercial horticulture crops such as green leafy vegetables, vit A rich fruits and vegetables, roots and tubers that have the potential to address micronutrient malnutrition in the state. Programmes to promote local entrepreneurship, such as through Farmer Producer Organisations and women's groups, in processing and value addition can improve the availability of these commodities in rural markets.

4. **State specific strategy for nutrition-education and women's empowerment in agriculture and nutrition may be developed:** The State Nutrition Mission adequately recognizes the importance of nutrition education and behaviour change alongside improvements in availability of diverse food crops and animal products. While the Mission recommends a state specific social and behavioural change communication strategy the state is yet to develop any such strategy. To create awareness on the nutrient content of local foods and bring about changes in specific behavioural patterns it is necessary to have state specific policies, over and above the existing National schemes. Further, nutrition education programmes must address all sections across gender and age groups through the life cycle.

5. **State Livestock Mission:** As recommended in the long term vision document of the state, convergence of all existing schemes in the livestock sector into a State Livestock Mission would help focus on holistic development of the sector and improve production and productivity of

livestock. This mission should also include a separate small ruminant policy focusing on improving productivity of animals such as goats, sheep and pigs.

6. **Strengthening the agricultural extension system** would be necessary so that farmers can receive appropriate technical guidance for adopting the FSN approach. It would be necessary to address the large number of vacancies that exists within the agriculture extension services in Andhra Pradesh. The agricultural extension service providers should be equipped with knowledge on nutritive content in different varieties of crop/fish, as also from egg and milk from different breeds, so that they can provide suitable advice to farmers.

7. **Legislation on Homestead Land:** A comprehensive legislation that is applicable to all families that do not own homestead in rural areas is needed. The Andhra Pradesh Occupants of Homesteads (Conferment of Ownership) Act, 1976 is applicable for the 'landless agriculturist', 'agricultural labourer' or 'artisan' in occupation of the dwelling house built at his expense (or at the expense of his predecessor) on a homestead belonging to a land owner. This Act can be suitably amended to have much wider scope to include dwelling houses built on land belonging to the State as also other categories of persons than what is specified by the Act, and a larger extent of area, say 10 cents, can be put in place. Homestead plot provided to a family would help in enabling the family build a shelter and take up supplementary activities such as backyard poultry, goat-rearing, horticulture and vegetable cultivation. This would enhance food and livelihood security of the homestead-less families, in addition to ensuring their human dignity. The title to the homestead may be granted in the name of adult woman of the eligible family given the fact that women are primary decision-makers on consumption diversity and that they value household nutrition more than men.

BIHAR

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:** 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, 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 Self-Help Groups 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.

MAHARASHTRA

Maharashtra has formulated a State Vision for 2030 that spells out 'Ensure sufficient and nutritious food for all at an affordable cost' as a goal. Incidence of malnutrition, particularly in tribal areas, is seen as a major challenge. To this end, Maharashtra's Maternal, Infant and Young Child Nutrition Policy has envisioned a role for the agriculture department in combating malnutrition and adequately recognizes the importance of promoting the cultivation of diverse crops and educating the public on the links between diet and nutrition. However, while the State Vision calls for need-based integrated farming systems to improve climate resilience and resource conservation, nutrition has not yet been recognised as a goal for agriculture and allied activities. Significant steps have been taken to reform agricultural marketing, improve climate resilience and water conservation, promote animal husbandry, and improve livelihood opportunities for women. A comprehensive agriculture policy for the state, when adopted, can achieve synergy between these initiatives and nutritional objectives. Some specific recommendations for promoting farming system for nutrition approach in Maharashtra are as follows:

1. **Improved nutrition must be placed as a key agenda in promoting Integrated Farming Systems:** The integrated farming system approach through land and watershed development, crop husbandry, dairy development, fisheries, apiculture, sericulture, etc has already been recommended for sustainable income generation, especially in areas with water scarcity. This approach can be modified to include the nutrition dimension, say, to address the nutritional deficiencies prevalent in a specific region. Steps can be taken by the government to implement this message in extension efforts and livelihoods programmes. Convergence between relevant departments – agriculture, horticulture, animal husbandry and fisheries- is needed to enable farmers to receive relevant inputs and knowledge.

2. **Kitchen garden initiative must be scaled up:** The state is already implementing a programme to set up kitchen gardens in tribal districts. The State Vision also directs the formation of kitchen gardens in schools, Anganwadi centres and communities. In keeping with the State Vision, efforts must be taken to widen the kitchen garden initiative. Rural households, schools, other institutions across all districts, not just tribal areas, must be encouraged to set up kitchen gardens. This initiative should incorporate awareness generation on the importance of diet diversity as also facilitation for planting material for the rural communities.

3. **Strategy for promotion of biofortified varieties must be developed:** Dhanashakti, the biofotified pearl millet variety was developed by Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri, Maharashtra in collaboration with ICRISAT. In spite of a development of a suitable biofortified variety from within the state no state policy impetus has been given to promote this or any other biofortified varieties. However, Dhanashakti is being cultivated in Maharahtra and the state can draw on the experience of farmers cultivating this variety in developing a strategy for promotion of biofortified varieties.

4. **Right to Homestead land must be recognised:** A comprehensive legislation to ensure that every homestead-less family in rural areas has a right to homestead land needs to be enacted. Homestead plot provided to a homestead-less family shall help in enabling the family build a shelter and take up supplementary activities such as backyard poultry, goat-rearing, horticulture and vegetable cultivation. This would enhance food and nutrition security of families, in addition to ensuring their human dignity. The title to the homestead may be granted in the name of adult woman member of the eligible family.

5. **Access to nutritious food in rural markets, through FPOs, must be promoted:** The state government is providing a huge impetus to value chain development and has called for farmers' group formation, infrastructure generation, direct marketing, e-marketing and agri-business entrepreneurship. End-to-end value chain development programmes have been implemented with the potential to stimulate production of principal and high-value crops. There is a need to focus on improving farmer incomes, care must be taken to also provide access to nutritious food, animal produce and processed products in rural markets. Rural markets can be modernized and Farmer Producer Organisations (FPO) or agri-businesses can be incentivized to reach underserved areas.

6. **Capacity building initiatives among women farmers' groups must be enlarged and strengthened:** Given the important role played by women in agriculture as well as nutrition, SHGs and women farmers groups based livelihoods programmes like the Mahila Kisan Sashaktikaran Pariyojana carry significant potential to empower women in agriculture and transform rural diets. Group-based programmes also ease the effort on extension workers as groups themselves can act as agents of change in their communities.

7. **Strategies to improve fish production and local availability must be adopted:** Several recommendations have been noted by the Task Force on Agricultural Development for enhancing fish production in the state. Implementation of the recommendations with regard to improving production as also supporting infrastructure facilities such as cold storage will enhance the availability and affordability of fish across rural areas.

8. **Strengthening the agricultural extension system** would be necessary so that farmers can receive appropriate technical guidance for adopting the FSN approach. It would be necessary to address the large number of vacancies that exists within the agriculture extension services in Maharashtra.

ODISHA

Government of Odisha has both a sound vision and policy framework for improving agricultural production and natural resource management. Odisha has also adopted a multi-sectoral Nutrition Action Plan. However, nutrition has not yet been recognised as a goal for agriculture and allied sectors. The long-term path to sustainable improvements in the nutritional status of the population lies in the propagation of nutrition-sensitive agricultural practices to ensure availability and access of nutritious food to all. Given that the majority of farmers in Odisha operate small or marginal holdings, 'farming system for nutrition' strategies are especially relevant in Odisha. While there is recognition of integrated farming systems, organic and natural farming and the importance of animal food products, there is scope to make existing primary sector policies more nutrition-sensitive and introduce supportive policies that will enable the state to improve its nutritional indicators while maintaining rapid agricultural growth. Some recommendations to integrate the dimension of nutrition in agriculture are:

1. **Develop a strategy for mainstreaming nutrition into integrated farming systems:** Integrated farming strategies have been recognized in agenda-setting documents such as the State Task Force for Agricultural Development as beneficial for resource poor and climate-vulnerable areas. Benefits of integrated farming on diversification of incomes and risk are recognized. Recommended strategies clearly specify the need for intercropping and mixed cropping and also lay down opportunities for integrating livestock and aquaculture. However, the nutritional benefits of these strategies have not been acknowledged. Guidelines of schemes to promote integrated farming can incorporate instructions to design cropping calendars and package of practices to meet the nutritional deficiencies. Other initiatives by the horticulture department to promote backyard plantation and kitchen gardens can also take into consideration nutritional deficiencies prevalent in specific regions.

2. **Formulate a strategy for promotion of biofortified crops and stress tolerant rice varieties:** A policy that spells out a clear-cut strategy for biofortification is required for Odisha. In the context of micronutrient and protein-energy malnutrition, high-iron, high-zinc varieties or rice and millets, high-protein maize and orange flesh sweet potato can be an effective way to address nutritional requirements without significantly altering diets and production systems. Formulating an effective strategy for making available the seed and planting materials of biofortified varieties would be necessary. Further, given that Odisha is prone to natural calamities such as floods; it is pertinent to formulate a plan for improving farmers' access to seeds of stress-tolerant rice varieties, particularly in vulnerable areas.

3. **Promotion of strategies for production of vegetables and fruits:** There are specific policies to improve production of most crops in Odisha. However, these can be further expanded to cover region specific non-commercial horticulture crops – vitamin A rich fruits, green leafy vegetables and other vegetables. Programmes to promote local entrepreneurship, such as, through Farmer Producer Organisations and women's groups, in processing and value addition, can improve the availability of these commodities in rural markets. Focused strategies to increase production of non-commercial horticulture crops would be needed.

4. **Bring convergence of Vasundhara scheme with suitable primary sector schemes:** In 2005-06 the Government of Odisha launched the Vasundhara scheme with an objective to provide homestead plots to the homestead-less population. Bringing about convergence between Vasundhara scheme and other government schemes such as backyard poultry, goat-rearing and horticulture could be attempted to enhance food and nutrition security of the families that have received homestead plots in

the Vasundhara scheme. Given the positive relationship between ownership of homestead land and household food security, repeating a state-wide survey on homestead-less families for appropriate action may be attempted.

5. **Strengthening the agricultural extension system** would be necessary so that farmers can receive appropriate technical guidance for adopting the FSN approach. It would be necessary to address the large number of vacancies that exists within the agriculture extension services in Odisha. The capacity of agricultural extension workers on aspects relating to nutrition as also the nutrient content of crops, including local specific crops, to be enhanced so that they can provide meaningful advice to farmers.

COMPARATIVE ANALYSIS ACROSS THE FOUR STATES

An analysis of the policy status with respect to a farming system for nutrition perspective, across the four states, brings out concerns that are broadly similar as also lessons for cross-learning.

Similarities

- The nutrition benefits of Integrated Farming System is not adequately acknowledged by any of the four states and IFS is seen essentially as an income generation, risk mitigation and climate resilience strategy by all the four states. There is scope to integrate the nutrition dimension in the IFS strategies through the existing central schemes such as National Mission for Sustainable Agriculture (NMSA) and Integrated Watershed Management Programme (IWMP).
- Kitchen gardens are recognized in nutrition vision documents in all four states as a strategy to diversify production and diets. However, there is scope to strengthen the ongoing initiatives across the four states. Access to technical guidance, input supply, particularly seed and plant material of vegetables and fruits, and appropriate financial allocation needs to be strengthened.
- Despite the availability of orange flesh sweet potato, high iron and zinc rich cereals and millets and protein-rich maize in India, the potential for biofortified crops to combat micro-nutrient deficiency has not been recognized by agriculture or nutrition policy in the states. State Nutrition policy must acknowledge a role for biofortified crops in meeting hidden hunger.
- All the four states have identified a food processing or marketing policy for the state that capitalizes on its production strengths. However focus is given to niche value chains, organic or high value crops, especially in horticulture, dairy and animal produce. State policies should focus on

processing and storage of nutri-rich crops (pulses, millets, and non-commercial horticulture crops) to meet the nutritional needs of rural population.

- Nutrition literacy programmes, in all four states, target pregnant and lactating women and adolescent girls. There is a need to enlarge the scope of nutrition literacy programmes to cover men and women of all age groups, with a life cycle approach. In addition, capacity building programmes targeting farmers should include information on nutritive content in different varieties of crop and animal based food produce.

- Across all four states there is a constraint in manpower resources in the agricultural extension system, including the allied sectors. There is a need to strengthen the extension services by minimising the gap that prevails between sanctioned and filled-up posts.

Scope For Cross-learning Across States:

Listed below are some state specific nutrition sensitive agriculture initiatives that have scope for replication in other states.

- Government of Andhra Pradesh has been promoting a half-acre Annapoorna model to enhance household availability of nutritious food among small and marginal farmers, through cultivation of a diversified variety of food grains, vegetables and fruits by adopting sustainable practices.

- Governments of Odisha and Andhra Pradesh have initiated a mission mode approach for promotion of millets covering all aspects from production to post harvest operations. It is necessary for states to adopt a mission mode approach towards millet promotion given its inclusion in the National Food Security Act.

- Governments of Odisha and Bihar have taken measures to provide homestead plot to rural families. Given the importance of homestead land on household food and nutrition security, it is important that other states formulate suitable measures to ensure entitlement of homestead land to rural families.
- Government of Maharashtra's Navinya Purna Yojana, a scheme for subsidized distribution of milch cattle, goat and poultry, essential livestock rearing inputs and supporting infrastructure encourages livestock farming and enhances household availability of nutritious food.
- Government of Bihar has so far developed three Road Maps that spell out the state's vision for agriculture and allied sectors. Such comprehensive planning documents have the scope to integrate nutrition as a goal for agriculture.

KEY RECOMMENDATIONS
FOR
PROMOTING FARMING SYSTEM
FOR NUTRITION IN INDIA

Nutrition must be recognised as a goal for agriculture and allied sectors in the country. The farming system for nutrition approach addresses the problem of malnutrition by mainstreaming nutritional criteria in the selection of crops/animal of a farming system. This approach calls for a shift towards diversified food production system and seeks a reorientation of existing agricultural policies to promote production of a variety of nutri-rich foods. The National Nutrition Strategy adopted by the Government of India, in September 2017, recognises the importance of a multi-dimensional approach to address malnutrition and envisions a role for the Ministry of Agriculture, indicative of nutrition-sensitive agriculture gaining importance in national policy in recent years.

Major Recommendations for Promoting Farming System for Nutrition in India:

1. Promoting Nutrition Literacy

- 'Genetic Gardens of Biofortified Crops' can be established to serve as an important tool for enhancing nutrition literacy for both producers and consumers. These Gardens would contain different food crops with varied nutritive content and suitable for inclusion in the local farming system. The Gardens are also a source for seed/planting material for farmers. Biofortified genetic resources, including the naturally nutrient rich crops, such as, *Moringa oleifera* - Drumstick, and other types of food crops can be grown in the garden with sign boards displaying the nutritive value of crops. Using the technical knowledge provided by genetic gardens farmers can identify the crops that can be integrated into their farming system and the consumers can design their food basket so as to address specific micro-nutrient deficiencies. Genetic gardens can be established at the district or block-level within the **Nutri-Farms Scheme** of the **National Food Security Mission (NFSM).**

- Nutrition education programmes should have a life cycle approach and can be done either through trained personnel (eg. workers representing health department and **Integrated Child Development Scheme (ICDS), community representatives/Community Hunger Fighters)** or by leveraging the strong Self Help Group platform prevalent in the country.

2. Addressing hidden hunger through promotion of backyard nutrition gardens and biofortified varieties

- **Nutrition gardens** that have a combination of green leafy vegetables, roots and tubers, fruits and other vegetables to be promoted among households and rural institutions (schools, Anganwadi centres, common areas etc.). Quality seeds/planting material for nutri gardens to be made available and accessible at the village level by promoting seed banks (for vegetables), managed by local institutions such as women Self Help Groups. Distribution of quality seeds for vegetables at the village level through the SHGs while simultaneously building their capacity on nutrition knowledge would have positive impact on the dietary diversity at the household level. **Women Food Security Groups** under **Agriculture Technology Management Agency (ATMA)** and **National Horticultural Mission** have scope to scale-up nutrition gardens on a mission mode approach.

- Biofortified varieties of various food crops with increased micro nutrient content have been developed and are available for cultivation in India. Given the potential for biofortified varieties to address specific nutrient deficiencies, and the scope available for promoting these varieties without significantly altering the diets and production system, it is necessary to formulate a strategy for promoting biofortified varieties among farmers. This strategy should cover different aspects: testing the efficacy of biofortified varieties to address nutrient deficiencies; creating awareness on these varieties among consumers and farmers:

providing technical guidance and devising appropriate policy support to farmers to promote cultivation of biofortified crops. There is scope to promote biofortified varieties under the **National Food Security Mission** for **Rice, Wheat** and **Coarse Cereals.**

3. **Overcoming protein hunger through increased production and consumption of protein rich foods**

Developing a holistic programme to enhance production, household availability and consumption, of a variety of protein rich foods, such as, pulses, fish, dairy and poultry products as a means to address the prevalent protein deficiency is needed. Major elements of this programme can be the following: to exploit the scope available across India to cultivate pulses as inter-crop and bund-crop as also in paddy fallows, with due attention paid to timely and adequate availability of quality seeds; to tap the available potential of inland water bodies across India to expand fish production, with due attention given to developing fish hatcheries; to focus on breed, feed and disease management in dairy and poultry sector with particular attention to improving the extension services for reaching technical knowledge among farmers on care practices. The ongoing schemes under **National Food Security Mission- Accelerated Pulses Production Programme (A3P), Targeting Rice Fallow Areas**- as also **National Watershed Development Project for Rainfed Areas** can be tapped in for developing a holistic programme.

4. **Improving access to nutri-rich foods by strengthening rural infrastructure**

Improving rural infrastructure with regard to decentralized storage structures, processing units and marketing facilities for vegetables, fruits, millets, pulses, milk and meat would be a prerequisite for enhancing the availability and accessibility of these nutritious commodities for the rural population. Programmes to promote local entrepreneurship in processing

and value addition through Farmer Producer Organisations, women's groups etc. can improve the availability and affordability of these nutri-rich commodities in rural markets. These components can be addressed through **National Rural Livelihoods Mission,** the **Rashtriya Krishi Vikas Yojana** and **National Mission for Sustainable Agriculture**

5. Right to Homestead Land

A comprehensive legislation to ensure every homestead-less family in rural areas has a right to homestead land needs to be enacted. This would enable the homestead-less families to build a shelter and take up supplementary activities such as backyard poultry, goat-rearing, horticulture and vegetable cultivation. Ownership of homestead land has huge potential to improve food, nutrition and livelihood security of families, in addition to ensuring their human dignity.

6. Strengthening Agricultural Extension Services

Farmers require appropriate technical advice and guidance for developing suitable, context-specific designs to integrate nutrition into their farming systems. The agricultural extension service providers should be equipped with knowledge on nutritive content in different varieties of crop/fish as also from egg and milk from different breeds so that they can provide suitable advice to farmers. There is an urgent need to address the large vacancies of technical and extension personnel prevalent today in the extension services across agriculture, animal husbandry and fishery sectors in India. There is also a need to build the capacities of agriculture extension workers on the nutrition dimension.

7. Strengthen departmental convergence for enabling joint-action plan

Convergence between relevant departments – agriculture and allied sectors with women and child development, education, health, etc. - would help in preparation of joint action plan for promotion of farming system for nutrition approach.

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