

Livelihood and Food Security in Himalayas through Sustainable Development Goals

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ABSTRACT

The livelihood of people in the Himalayan states (Uttarakhand, Sikkim, Himachal Pradesh, Jammu and Kashmir, Arunachal Pradesh, Assam and West Bengal) are predominantly dependent on agriculture. These states inhabit approximately 153752518 people within an area of 579544 km², with a population density of 265 km² therefore, the actual pressure on agricultural land is much higher, thereby availability of crop land is too small to support livelihood of rural households in the mountains. Poverty, small holding size, food security are the critical challenges in the mountainous states. The three main areas of investment for MDG scenario are rural roads, irrigation and education. One of the ways to improve the livelihood in the mountainous states is the proper management of the marginal land holdings, so that the malnutrition in the states could be addressed. With the ever increasing population pressure, poverty, soil erosion & degradation, and loss of natural resources for food security, improved livelihood and environmental protection, the states can't achieve the millennium development targets. Diversification of farm activities into high value commercial crops, and processing of agricultural and other natural resource based materials, while adequately maintaining soil, forest and other natural resources, are most logical steps to improve livelihood of mountain people and achieve the millennium development goals up to some extent. Mountains provide an excellent avenue of diverse agro-climate and niches for horticulture, floriculture, spices and medicinal plants.

The paper explicates the challenges faced by mountainous states and efforts made through agricultural research and development to improve food and livelihood security through sustainable management of natural resources, because, all the development goals are interlinked with the agricultural development.

Key words: Livelihood and food security, land holdings, millennium development, mountainous states, poverty alleviation.

1. INTRODUCTION

Hunger and poverty are the two formidable development challenges confronting the world today. Of the world population of around 815 million people in the world don't get the food they need to live a healthy life, 52 nations are food deficit countries (FAO, 2016) and 98 per cent of such population lives in the developing world. (2017 FAO Stats). Bangladesh, China, the Democratic Republic of Congo, Ethiopia, India, Indonesia and Pakistan account for two-thirds of the world's undernourished population (Population Action International, Healthy Families Healthy Nation, FAO, 2016). Asia has the largest number of hungry people, with two-thirds of the population affected. (FAO, 2015). The hunger and poverty situation is more alarming in the developing world including Himalayan states. Food security is linked to food intake at the individual level, and food availability at a higher level. Food security will be achieved when poor and vulnerable households living in the marginal areas, have physical and economic access to food, and will be achieved when they have sustainable livelihood. The FAO indicator for subsistence level is 2250 calories/day/cap (0.8 gm/kg body wt. protein and other essential fats and vitamins) food requirement.

About 70 per cent of the Millennium Development Goals' target group live in rural areas of Asia and Africa, and for the developing world, agriculture is a critical component in the successful attainment of these goals. Though the importance of structural transformations is there but, immediate gains in poor households' welfare can be achieved only through agriculture, which helps poor to overcome some of the grave constraints they face in meeting their basic necessities. Thus, a necessary component in meeting the MDGs by 2015 in many parts of the world is a more productive and profitable agricultural sector (World Bank).

Food security is greatly influenced by physical, economic, natural resources, socio-cultural, gender and ethnic factors. This has direct and indirect effect on health and behaviour of the people. Sustainable livelihood therefore, focus not only on assets but capabilities (including social resources) and activities for means of living that can cope with and recover from stresses and shocks. Livelihoods of majority of the people and communities in Himalayan states are heavily dependent on natural resources and agriculture. The Himalayan Research Group undertakes the initiatives of simplification of technology in core areas like agriculture and allied activities to generate livelihood and enterprises through effective communication and the use of local material and resources to reduce the initial cost. It is imperative to support and promote the synchronisation of modern technologies with traditional and indigenous knowledge for sustainable rural development resulting in the efficient use of existing resources and diversification of activities leading to rural enterprises.

Natural resources are most vital in Himalayan states in terms of providing fuel wood, fodder, biomass, and other major and minor forest produces. Management of natural resources is crucial for supporting livelihoods, particularly among marginal communities. Over the last few decades the natural resources have been shrinking due to indiscriminate extraction coupled with large-scale habitat losses affecting livelihoods of people who are socio-economically poor and belong to backward classes. (Proceedings, Conference, Pathways to climate resilient Livelihoods in the Himalayan River Basin).

2. Discussion

The undernourishment and its prevalence, is the main indicator of hunger used by the United Nation's Food and Agriculture Organization. It measures the share of the population which has a caloric (dietary energy) intake insufficient to meet the minimum energy requirements defined as necessary for a given population. The prevalence of undernourishment- as a percentage of the total population is shown in table 1, from 1990 onwards. From the table it is very clear that parts of South-Asia, Africa & Sub-Saharan Africa are having highest prevalence of undernourishment (15.7 %, 20.0 % & 23.2%) in 2016 compared to global percentage of 10.9 per cent.

Table 1: Undernourishment and its prevalence

	1990-1992 No.	1990-1992 %	2014-2016 No.	2014-2016 %
World	1,010.6	18.6	794.6	10.9
Developed regions	20.0	<5	14.7	<5
Developed regions	990.7	23.3	779.9	12.9
Africa	181.7	27.6	232.5	20.0
Sub-Saharan Africa	175.7	33.2	220.0	23.2
Asia	741.9	23.6	511.7	12.1
Eastern Asia	295.4	23.2	145.1	9.6
South-Eastern Asia	137.5	30.6	60.5	9.6
Southern Asia	291.2	23.9	281.4	15.7
Latin America & Carib.	66.1	14.7	34.3	5.5
Oceania	1.0	15.7	1.4	14.2

Source: FAO The State of Food Insecurity in the World 2015 p.8

2.2 Hunger and its estimate

The Second International Conference on Nutrition (ICN2) was an inclusive inter-governmental meeting on nutrition, held at FAO Headquarters, in Rome, 19-21 November, 2014 focused particularly on nutrition challenges in developing countries, addressed all forms of malnutrition, recognizing the nutrition transition and its consequences. Hunger and malnutrition are universal problems that affect millions of people in the world today, especially the developing world. Although little progress has been made in recent years to curb undernourishment and is brought down by 21 per cent from 1992.

Table 2 shows trends in world hunger statistics. The table shows North-Korea, Zimbabwe and Afghanistan is having highest proportion of undernourished population with 41.6, 33.4 and 26.8 per cent of undernourished population with a universal score of 28.8, 30.8 and 35.4 respectively. India is having an undernourished population of 15.5 per cent with a score of 29.

Table 2: Trends in Hunger estimates

Country	Proportion of undernourished in population (%)	Prevalence of wasting in children under five years (%)	Prevalence of stunting in children under five years (%)	Under five mortality rate (%)	Score
Afghanistan	26.8	9.5	40.9	9.7	35.4
Bangladesh	16.4	14.3	36.1	4.1	27.3
Brazil	1.6*	1.8*	6*	1.4	<5
Cambodia	14.2	9.6	32.4	3.8	22.6
China	9.3	2.3	9.4	1.3	8.6
Costa Rica	3.8*	1.1*	3.5*	1	<5
Cuba	0.8*	2.1*	4.9*	0.6	<5
Fiji	4.5*	6.6*	3.7*	2.4	8.7
India	15.2	15	38.8	5.3	29
Indonesia	7.6	13.5	36.4	2.9	22.1
Iraq	22.8	7.4	22.6	3.4	22.2
Kenya	21.2	4	26	7.1	24
Libya	-	6.7*	21.8*	1.5	-
Malawi	20.7	3.8	42.4	6.8	27.3
Mexico	4.3*	1.6	13.6	1.5	7.3
Myanmar	14.2	7.9	35.1	5.1	23.5
Nepal	7.8	11.3	37.4	4	22.2
Nigeria	7	18.1	36.4	11.7	32.8
N. Korea	41.6	4	27.9	2.7	28.8
Oman	-	3.7*	5*	1.1	-
Pakistan	22	10.5	45	8.6	33.9
Russian	0.7*	4.4*	12.3*	1	6.6
S. Arabia	1.2*	4*	3.4*	1.6	5.1
Ukraine	1.2*	1.3*	7.4*	1	<5

Vietnam	11	5.7	19.4	2.4	14.7
Zimbabwe	33.4	3.3	27.6	8.9	30.8

Source: <http://www.welthungerhilfe.de/en/home-en.html>

2.3 Infrastructure Development

Development of a country highly depends on the availability of infrastructure available. Agricultural development solely depends on its infrastructural base. Lack of a sound infrastructural base is a weak signal for a country. More important and difficult job in the development process of the country is to provide the basic infrastructural platform.

Since independence Indian planners provide high priority to the development of infrastructure, thus a huge amount of funds were allocated under different plans for building various infrastructural facilities. In the First Six Plans, about 55 to 61 per cent of the total plan outlay was devoted to infrastructure development. During seventh Plan about 63 per cent of the total plan outlay was allocated to infrastructure only. Development of roads is one of the components of infrastructural development in the country, despite all this the roads are still not up to the mark of expectations. Table 3 shows that even after 70 years of independence, the country is having only 84.32 km per 100 sq. km to its residents and the situations is somewhat lacking behind in Himalayan states of the country as 81.56 km per 100 sq. km of roads has been built. Jammu and Kashmir being one of the Himalayan states is far behind in macadamised road development as only 35.21 km per 100 sq. km has been developed so far which means still a lot has to be done on this front.

Table 3: Infrastructure in Himalayan States and India

States/Country	Road length (Km)per 100 Sq. Km
Jammu & Kashmir	35.21
Himalayan States	81.56
India	84.32

Source: *Digest of Statistics, Department of Economics and Statistics.*

2.4 Himalayan Agriculture and Susceptibility

The economy of Himalayan states is as diverse as its topography, ranging from the subsistence farmers to the prosperity of the fruit economy. The other dominant activities include handicrafts, labour, fruit processing, tourism etc. The major crops in Himalayan states are corn, wheat, millet, barley, buckwheat, sugarcane, tea, oilseeds, and potatoes. A

wide variety of fruits like apple, pear, cherry, banana etc. are grown in each of the major zones of the Himalayan states. Eco-tourism has emerged as a major growth industry in the Himalayas with construction of major roads and the development of air routes changing the traditional transportation patterns. Though having abundance of water resources, the Himalayans states face unproductive irrigation capacities which cause climate refugees in these states. The Himalayan states face problem of fragmented land holdings, which results into low productivity and labour scarcity for cultivation of agricultural land. These states have reduction in food grains, production and area owing to high rate of transition in favour of cash crops. For marketing of these crops the villages have transformed into market towns, resulting into high rate of migration and urbanisation in these states.

2.5 Resource base in Himalayan states

Indian agriculture needs to secure food supplies for a population of 1.2 billion. It accounts for 20.4 per cent of the world's agriculture and, in terms of India's food production alone, it has grown more than five times since independence when it was producing 50.8 million tons a year. India currently produces more than 250 million tons of food grains a year (the highest ever production was 264.8 million tons in financial year (FY) 2013–2014). Average operational holding size of the country like India in 2014 was 1.16 ha that of Himalayan states it was 1.7 ha and in Jammu and Kashmir State it was 0.62 ha. In the same manner the net sown area in India was 44.7 per cent and that of Himalayan states was 21.3 percent compared to Jammu and Kashmir it was 42.49 per cent. The cropping intensity was found to be highest in Jammu and Kashmir state compared to the National level and from Himalayan States. Thus from the table 4 it can be highlighted the Himalayan states are very resource poor states compared to other states in the country.

Table4: Resource base in the Himalayan states

States/Country	Average Size of operation holdings 2014 (ha)	Net sown area (%)	Cropping intensity (%)	Irrigated Area (%)	Forest area as percentage of reported area
Jammu & Kashmir	0.62	42.49	155.8	42.49	83.7
Himalayan States	1.7	21.3	134.7	21.3	59.5
India	1.16	44.7	137.3	44.7	25.3

Source: Digest of Statistics, Department of Economics and Statistics.

2.6 Technology adoption

Consumption of fertilisers varies significantly from state to state. All India per-hectare consumption of total nutrients was 89.8 kg in 2003/04. While the North and South zones have a consumption of more than 100 kg/ha, in the East and West zones the consumption is lower than 80 kg/ha. Among the major states, the per-hectare consumption is more than 100 kg in West Bengal (122 kg), Haryana (167 kg), Punjab (184 kg), Uttar Pradesh and Uttaranchal (127 kg), Andhra Pradesh (138 kg) and Tamil Nadu (112 kg). In the remaining states, the consumption per hectare is lower than the all-India average. Table 5 shows fertilizer consumption per hectare of the gross cropped area in the Himalayan states 54.5 kg/ha and at national level it was 144.33 kg/ha in 2014 and 87.4 kg/ha in Jammu & Kashmir. Similarly, the exotic/crossbred cattle in Himalayan states was 14.17 per cent and that of National level it was 20.81 per cent and for Jammu and Kashmir it is highest 52.52 per cent during the same time period. The rearing of exotic/crossbred sheep in Himalayan states was 48.52 per cent compared to National level it is only a mere 5.81 per cent and for Jammu & Kashmir state it is again highest 68.31 per cent.

Table 5: Adoption of technology in Himalayan states

States/Country	Consumption of fertilizer (kg/ha)	Exotic/Crossbred cattle	Exotic/Crossbred Sheep
Jammu & Kashmir	87.4	52.52	68.31
Himalayan States	54.5	14.17	48.52
India	144.33	20.81	5.81

Source: Digest of Statistics, Department of Economics and Statistics.

2.7 Livestock rearing

Livestock rearing is a very important component in India. In case of livestock rearing, it is still integrated with the natural environment to a greater extent, less dependent on purchased inputs and external factors. Another key factor is, in arid and semi-arid regions of India, agriculture is possible only for three to six months in the monsoon period and high cost irrigation investments are beyond the reach of most of the farmers. Thus, for a large percentage of the rural populace, cattle rearing, which provides steady income, is essential for their survival. From table 6 it can be seen that livestock intensity in Himalayan states is higher than the national level so it is higher for the state of Jammu & Kashmir state as well. Jammu and Kashmir is considered as livestock rich state and therefore is highest producer of meat and milk. Likewise the livestock density for Himalayan states is 80.85 compared to National Level it is 119.05 sq.kms

Table 6: Animal rearing in Himalayan States

States/Country	livestock intensity	livestock density sq.kms
Jammu & Kashmir	0.75	42.59
Himalayan states	0.55	80.85
India	0.32	119.05

Source: Digest of Statistics, Department of Economics and Statistics.

2.8 Availability of food

Availability of food is considered to be one of the basic indicator for the development of any nation. The per-capita availability of food grains in Himalayan states in 2015 was 324.6 gm/day and that for the national level it is 493.8 gm/day. Similarly the per-capita availability of milk is 275.8 gm/day at national level and 172.5 for Himalayan states and 133.6 gm/day for J&K. Similarly, the per-capita availability of fish is very low for all the three regions in discussion as 1.6, 10.5 and 19.1 gm/day for Jammu & Kashmir, Himalayan states and National level respectively

Table 7: Per capita Availability of food item in Himalayan States

States/Country	Per capita availability of food grains(gm/day)	Per capita availability of milk(gm/day)	Per capita availability of fish(gm/day)
Jammu & Kashmir	109.1	133.6	1.6
Himalayan States	324.6	172.5	10.5
India	493.8	275.8	19.1

Source: Digest of Statistics, Department of Economics and Statistics.

3. Priority for development

For the development of Himalayan states the following needs to done at priority;

- Promotion of village economy and leadership
- Ensured access to resources
- Investment for socio-economic overheads and public-private partnership (PPP) models
- Establishment of associations and Farmer-producer organisations (FPOs)
- Ecosystem approach for inclusive growth
- Capacity development and knowledge sharing
- Shift from traditional to niche based production
- Creation of climatic resistant production system
- Institutionalreform and support

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