CHAPTER 6
POTENTIALS FOR DEVELOPMENT AND POLICY SUGGESTIONS
FOR IMPROVING FOOD SUFFICIENCY

Food for all has always been categorized as one among many basic needs of human being in the realms of knowledge. And globally policies of all the governments have been giving fair place to food and food related issues. As this thesis has attempted to look into the trends in area, production and yields of food grains, along with this thesis also tries to study the changing scenario in agriculture of India and Rajasthan with changes in demographic behaviour of India under changing socio-economic conditions in the country. Historically, India was the country known for its frequent famines and food deficit related deaths. Under British rule agriculture was highly neglected and framers were forced to commercialize, ignoring food production. Low food production and in absence of any further food supplies to deficient areas, India was reeling under intense food problem, there was no time when whole of India was free from food related problems. Later on, with the independence, Indian policy makers worked towards eliminating the biggest scare on Indian civilization by the way of intense planning. Agriculture gained limelight in policies and five year planning. And this policy thrust by government made green revolution to happen in India. Green revolution made India to shift from food grain importing country to food sufficient food grain exporting country.

The question of analyzing food-population relationship has basically three dimensions i.e. population increase, food grain production and social-economic changes. Moreover, food production and population both are also highly dependent on socio-economic milieu. Any change in socio-economic parameter lead to changes in the behaviour and performance of agriculture and population. It is evident with respect to Indian economy that gains, which were achieved from green revolution became vanish off as socio-economic conditions under changes caused by the adoption of New Economic Policy-1991. After New Economic Policy -1991, Indian economy became integral part of global economic order and along all the sectors, including Indian agriculture is faced with many challenges and advantages. Among advantages vast tracks of productive land had large production potentials and large cultivation period and monopoly in some crops such as fruits and vegetables are important. On other hand, challenges faced by agriculture are many and diverse with far reaching effects, one among them is that opening up of economy for global markets has created lure among farmers for gaining profit from commercial crops (Patnaik, 2005).
With respect to food-population relationship changes in including socio-economic conditions, market forces also started to play much more active role after 1991. As under the computations of World Bank and International Monetary Fund government opted for minimal role in governing economy, it was market which was deciding what to produce and how to produce. It is market forces which are now determining contours of future food-population relationship. Under these policy changes, Indian agriculture underwent some serious changes putting food sufficiency of India at stack. This thesis shows (in chapter-3) that Indian agriculture has witnessed changes in cropping pattern favouring non-food commercial crops leading to negative impact on food availability. This situation is even more dangerous when it is considered with the fact that Indian agriculture has reached to its plateau in production and productivity with the onset of these changes. Situation is even more challenging at meso and micro level, and in the states that are reeling under adverse geo-climatic conditions situation in terms of food-population is even more demanding. Here adversity in geo-climatic conditions has not led agriculture to flourish and whatever gains were achieved from human endeavour are facing serious setback under market forces in terms of food-population balance and if no proper action is taken to arrest the situation future looks very dismal under present conditions.

In the light of above, this chapter identifies potential areas for improving future food balance of the society, as potential areas will help in boosting production and availability of agricultural commodities. At the same time chapter also suggests some policy changes so that problem pertaining to food can be ameliorate and a flip can be given to the food status of every individual. These policy changes would work towards harmonise the distributional aspect of food grains among all social groups.

### 6.1. Potentials for Development in the Form of Changes in Agriculture

India is a vast country with huge variations in production capacities as it is blessed with various agro-climatic regions. Minor adjustments in the production techniques along with in the storage, may boost production in a big way. This section of chapter suggests some areas which can be potentially give boost to food status of the society. These suggestions will argument food production and will push for favourable food balance.

#### 6.1.1. Reduction in Yield-Gaps

The production of food grains in India increased considerably since independence due to increase in arable area, large-scale cultivation of high yielding semi-dwarf varieties and increased applications of irrigation, fertilizers and pesticides. India became food secure in the last three decades, at gross level, because of increase in food
production (ICRISAT 2008). However, the food secure status of India seems to be at risk as population of India is increasing considerably. According to a modest estimate by 2040, India’s population is expected to grow to 1.6 billion people from the current level of 1.1 billion. This would imply a greater increase in the demand for food. Moreover, changing income levels are also bound to have some changes in demand pattern of consumers. As with the increase in income levels demand for food grains, especially of refined food goes upward. The only way out is to increase in yields, that are only sustained till 1990s when yields of almost all crops reached to their plateau level. In the absence of any rigorous efforts in expansion of irrigation facilities green revolution concentrated itself in regions specifically where irrigation was available. After 1990s neither India witnessed any technological breakthrough in production technology to boost production, nor did the area expansion take place. The annual rate of growth of cereal production and yield showed a peak during the early years of the green revolution, but since 1980s there has been a decline and trend still persists (Ray, 2011). Situation seems to more worrisome when according to a modest estimate by 2020 the average yields of rice and wheat need to be increased by about 60%, similar is the scenario for many other crops to meet the ever growing demand for food in India. In this light, the only way out is to bridge the whooping gap in yields of crops between and within regions.

International comparison of yields of principal crops in India does not reveal very rosy picture. Table 6.1 reveals that India stands very low in global comparison of yields. In India yields are low because of institutional and technological bottlenecks. Yield of crop is not only the function of productivity of field and climate, but it is also dependent on the institutional setup and technology available to farmers. In India neither the institutional set up nor the technology is up to the task. The green revolution of 1960s was the last technological up gradation of Indian agriculture, that too was of limited reached in terms of spread and coverage of crops. There is hardly any scope for expansion of area and the main emphasis would be on increasing the productivity of food crops by adopting the improved cultivation practices.

On the lines of Indian yields, yields at the state level are also low and highly skewed. Regions which were the core of green revolution are having higher yields but rests of other regions are far legged behind. Regions which were by-passed by green revolution technology are so much legged behind that they are not able to meet the average yield of the region.
Table 6.1
Global Yield Comparison of Various Crops, 2011 (in Kg per Hectare)

<table>
<thead>
<tr>
<th>Country</th>
<th>Wheat</th>
<th>Rice</th>
<th>Maize</th>
<th>Barely</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>3907</td>
<td>5869</td>
<td>2247</td>
<td>3556</td>
</tr>
<tr>
<td>Japan</td>
<td>4030</td>
<td>6770</td>
<td>2485</td>
<td>----</td>
</tr>
<tr>
<td>Korea</td>
<td>3048</td>
<td>6083</td>
<td>2485</td>
<td>----</td>
</tr>
<tr>
<td>Egypt</td>
<td>6150</td>
<td>7915</td>
<td>6681</td>
<td>3054</td>
</tr>
<tr>
<td>Italy</td>
<td>8989</td>
<td>5553</td>
<td>8362</td>
<td>2594</td>
</tr>
<tr>
<td>France</td>
<td>6676</td>
<td>4555</td>
<td>7827</td>
<td>----</td>
</tr>
<tr>
<td>Germany</td>
<td>6707</td>
<td>----</td>
<td>6821</td>
<td>----</td>
</tr>
<tr>
<td>India</td>
<td>2617</td>
<td>2817</td>
<td>1750</td>
<td>2138</td>
</tr>
<tr>
<td>World Average</td>
<td>2665</td>
<td>3837</td>
<td>4472</td>
<td>2472</td>
</tr>
</tbody>
</table>

Source: FAO Production Year Book, 2011

6.1.2. Proper Thrust on Millets

India has worked heavily on the expansion of irrigation technology as India lies in low moisture region of the world. And after 67 years of independence only 40 percent of gross cropped area is irrigated. Un-irrigated land accounts for nearly 60 percent of the total geographical area that has no source of irrigation, hence it is entirely dependent on the mercy of rain, and hence it is often termed as rain-fed, it is the land to that favour millets cultivation. Potentially, this rain fed region can huge scope of cultivation of millets i.e. Bajara, Jowar, Ragi, Maize. These crops require less water to sustain and these can be grown on any kind of surface. Millet is a collective term referring to a number of small-seeded annual grasses that are cultivated as grain crops, primarily on marginal lands in dry areas in temperate, subtropical and tropical regions (CIDA, 2012). ‘Millet’ describes a number of different small-grained cereal grasses. Although millets do not derive from one plant species, they do share consistent common features. Millets are cultivated in most of the dry regions globally and also in India. Millets suits for dry and arid climate, and they are almost pests and diseases resistant. Millets are better adapted to dry, infertile soils than most other crops, and are therefore often cultivated under extremely harsh conditions – for example, high temperatures, low and erratic precipitation, short growing seasons and acidic with infertile soils and poor water-holding capacity. Most millet have strong, deep rooting systems and short life cycles, and can grow rapidly when moisture is available. As a result, they can survive and can be a reliable food producer in areas, where mean annual precipitation is as low as 300 mm (Mythili, 2008).

Historically, Indian food policy is always inclined towards wheat and rice, ignoring millets entirely; this is proved by functioning of FCI as it is present in wheat,
rice producing regions and its absence in other dry regions. But given the agro-climatic features of India and given the scope and present status of irrigation facilities millets can be key to future food sufficiency of India. Millets are usually subdivided into ‘large millets’ (sorghum and pearl millet) and ‘small millets’ (CIDA, 2012) and these staple crops which are superior to other cereals and can be used for dual purpose of food and fodder. One more interesting aspect of millets is that now with the changing life-style of modern man, millets are seen as ‘food of rich’ in urbanised societies.

Analysis in chapter 3 reveals that Millets are in a situation of crisis in India. The period between 1950 and 2009 saw a dramatic decrease in cultivated area under millets, decrease in total production and a significant decrease in per capita availability of all millets. This is despite of high yield gains to Bajara and Jowar. This has resulted in a steep fall in overall millets consumption. Still in this time of crisis for millets, India is the biggest producer of millets in the world and millets remain a staple crop for numerous households including for poor’s and deprived sections of the society. By promoting use of millets production and by boosting its role in food system of India, it will gain not only in gross food availability, but also in qualitative aspects too as millets have good nutritional value. Given this context millets being predominantly grown in rain fed conditions and India has more than half of its area classified as rain fed, thrust to millets will improve future food prospects nationally and regionally both.

Recent study by Canadian International Development Agency (2012) suggests that millets are not getting due share in food system of India because of underlying barriers such as

- Absence of production support by government as other crops such as wheat or rice is enjoying.
- Absence of R & D activities and diffusion of advance know how.
- Lack of post-harvest processing technologies leading to great post-harvesting losses.
- Absences of any remunerative price stability mechanism as other crops are enjoying in the form of MSP.
- Changes in consumption pattern and consumption preferences which is highly inclined towards wheat and rice.
- Absence of support from government in production as well as distribution through PDS. A recent proposal of the National Advisory Council (NAC) that deserves policy attention relates to the supply of millet and other coarse cereals would be distributed through the PDS.
In general this can be concluded that promotion of millets can bridge the growing gap between the demand and supply of food grains, at the same time as it is cheap and nutritive will also flip nutritional status of the society. And promotion of millets can be a form of revolution in the country, especially in rural areas as most of them preferred food cooked from millets.

6.1.3. Reclaiming of Fallow and Barren Land

Land is finite resource and availability of land or addition of newer land is one of the key aspects to increase agricultural production. As India is now utilizing maximum available land for agricultural production under present technological levels and demand for food is still unmet. Therefore, need of hour is to look for some alternative way to argument agricultural land. This thesis suggests reclaiming of fallow and barren land as potential for India’s future food prospects as India accounts nearly 12.6 % area of the total geographical area as barren and fallow (barren 5.6 % and fallow 7 %). Long and often unscientific use of land resources has led to fall in the general productive capacity of land and rendered them as uneconomical. Table 6.2 shows cause wise distribution of barren land in India and reveals that highest amount of land is degraded by gully erosion and water logging which can reclaimed to enhance land for cultivation by widening technological base.

<table>
<thead>
<tr>
<th>Categories of wasteland</th>
<th>Area (in Million Hectares)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gullied/ravenous land with/ without scrub</td>
<td>19.4</td>
<td>6.13</td>
</tr>
<tr>
<td>Waterlogged/marshy land</td>
<td>1.66</td>
<td>0.52</td>
</tr>
<tr>
<td>Land affected by salinity</td>
<td>2.04</td>
<td>0.65</td>
</tr>
<tr>
<td>Shifting cultivation area</td>
<td>3.51</td>
<td>1.11</td>
</tr>
<tr>
<td>Degraded notified forest area</td>
<td>14.07</td>
<td>4.44</td>
</tr>
<tr>
<td>Degraded pastures/grazing land</td>
<td>2.6</td>
<td>0.82</td>
</tr>
<tr>
<td>Sandy area</td>
<td>5</td>
<td>1.58</td>
</tr>
<tr>
<td>Mining/industrial wasteland</td>
<td>0.12</td>
<td>0.04</td>
</tr>
<tr>
<td>Barren rock</td>
<td>6.46</td>
<td>2.04</td>
</tr>
<tr>
<td>Steep sloping surface</td>
<td>0.77</td>
<td>0.24</td>
</tr>
<tr>
<td>Snow covered area</td>
<td>5.58</td>
<td>1.76</td>
</tr>
</tbody>
</table>


Excess use of fertilizers, pesticides and mono cropping are some of the basic causes of fall in land quality and its degradation. This degraded land can now be claimed back with appropriate technological intervention and can argument the land availability for the cultivation of crops and can improve food production as well.

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6.1.4. Reduction in Post-Harvesting Losses

Post-harvest Food Losses are defined as measurable qualitative and quantitative food loss along the supply chain, starting at the time of harvest till its consumption or other end uses. Food and Agriculture Organization of U.N. predicts that about 1.3 billion tons of food are globally wasted or lost per year (Gustavsson, et al. 2011). Reduction in these losses would increase the amount of food available for human consumption and enhance global food security, a growing concern with rising food prices due to growing consumer demand, increasing demand for bio-fuel and other industrial uses, and increased weather variability.

In India also, with the increase in food prices and food associated problems the question of post harvest loss of agricultural commodities has become an increasing relevant issue over the last few years. As per the Indian Council on Agricultural Research (ICAR), the loss of food items with reference to food grains is 5.8 to 18 % of total production and in reference to loss in fruits and vegetables that are highly perishable commodities it ranges between 12.4 to 18% post harvests. Prevention of these losses can be extremely beneficial in preventing food crisis. Checks of post harvest loses can work to minimize the growing mismatch in demand and supply of food items by augmenting general availability of food.

6.2. Policy Suggestion to Improve Food Status of the Society

After identifying potentials of India in achieving secure food balance, this section suggests some policy alterations in existing policies so that food resources can be managed in a better way. In the other words, this section primarily deals with management of available food resources to harmonise distributional aspect in the society.

6.2.1. Higher and Differential MSP for Food Crops

In India to provide some form of assistance to crop farmers’ government of India declares Minimum Support Price (MSP) from 1966-67 for 25 different crops of Rabi as well as kharif seasons. MSP gives assurance to farmers if market price fall below MSP government would buy produce of farmer at MSP to protect farmers from any form of losses due to fall in prices. Basically, this MSP is the price slightly higher from the input cost of farmer, plus normal profit. MSP is declared on the recommendation of Commission for Agricultural Costs and Prices (CACP) and it is an annual exercise. MSP is declared for food as well as non-food crops and past data reveals that non-food crops witness much higher increase in MSP as compare to food crops. This push farmer to grow non-food crops in the
place of food crops. Therefore, government should rectify MSP policy by declaring higher rate of increase in MSP of food crops, so that higher MSP may prompt farmers to grow more food crops in comparison to non-food crops as MSP will provide them much needs price security.

6.2.2. Revamping of PDS

Public Distribution System (PDS) is principal instrument in food delivery mechanism of India. It distributes subsidized food and non-food items to India's poor. Major commodities distributed include staple food grains, such as wheat, rice, sugar, and kerosene, through a network of Ration shops established in all the states across the country. In terms of its coverage and reach PDS is most important tool in ensuring universal food sufficiency. In the times when India ranks 66th in Food and Agriculture Organization’s (FAO) World Hunger Index of 88 countries and more than 200 million people in India are not having any adequate nutrition delivery mechanism, PDS is of immense utility. Moreover, in the times of rise in food prices PDS is utmost important to meet the un-met demand for food.

From last few decades PDS is under severe criticism from all wakes of life. Prime problems in the functioning of PDS are “57% of the PDS food grain does not reach the intended people” (UIDAI, 2009) and ‘inefficiencies’ on the part of fair price shops. Moreover, in the country which is ‘food sufficient’ at macro level and where hunger and malnutrition is very high buffer stocks of food grains in the Food Corporation of India is getting damaged and rotten grains being destroyed despite millions of starving population not only to show the worst form of paradox, but is also the most inhumane and unethical experience (Ray, 2011; 20). The only way out is to mend the loop holes in the PDS mechanism as PDS can be made universal and better targeted. Recent decision of Indian government to attach PDS entitlement to biometrics information of Aadhar card is better step in this way. The widening of the food basket by including coarse cereals in the preview of PDS will also boost its efficiency levels (Nakkiran, 2004; 3).

6.2.3. In-time Distribution of Food from Surplus Regions to Food Deficit Regions

Prime staple crops are grown in large amount in some specific parts, i.e. as Punjab, Haryana, Uttar Pradesh is growing much more than their food requirements. Surplus food is than stored in state warehouses and FCI godown. These FCI storages keep food grains exceeding their limits causing millions of tons of food grains to rot under hot and moist conditions. This is the part where food management is poor in India. One hand, millions are living empty stomach and on other hand, food is rotting in FCI storage houses.
The possible solution lies timely shifting of food grains from surplus regions to food deficit. More FCI storages should be built keep in mind the growing demands of more storage. In conclusion, this can be concluded that the dry land hold land potentials, being a large and varied ecosystem, the need of hour is to work in proper planning and implementation.

In conclusion, it can be accepted that need of hour is the out of box thinking focusing on reclaiming wasteland and fallow land to increase production and at the same time focus show be removing regional variations in the yield of crops, between the regions and within the region. Moreover, use of existing food resources in the form of millets should also be utilized to boost food availability as there is immense scope for the production of these crops in Indian climate. With reference to policies lot of things can be done to give policy importance to food crops by increasing MSP of food crops greater than non-food crops. And revamping of PDS and distribution of surplus food from different regions can have a big boost to food prospect of India.
References:


Unique Identification Authority of India (2009): *Leakages in PDS and Remedies, editorial in, Times of India, New Delhi.*