



Community based
responses to
food insecurity

Dr. Amitava Mukherjee

CAPSA-ESCAP
Jalan Merdeka 145, Bogor 16111
Indonesia
© 2010 by the CAPSA-ESCAP
All rights reserved. Published 2010

Cover photograph by Izzet Keribar (Nepal Rice Harvest).

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

The opinions expressed in signed articles are those of the authors and do not necessarily represent the opinion of the United Nations.

Cummonity Based Responses to Food Insecurity¹

Dr. Amitava Mukherjee Ph. D.*

“A journey of a thousand miles begins with a single step”

Confucius

I. Introduction

This paper, after a brief reference to conceptual framework within which to analyze community responses and clarifying special terms used, discusses how communities associate well-being with food security. The paper then presents a set of community responses to prevent food insecurity or deal with it once it sets in. The responses described here are set out in a particular order: production response; increasing food availability; increasing economic access to food; consumption responses; food storage and protection responses; multiple coping responses and finally distress measures. Although the distress measures are essentially individual responses yet given their import in the overall social fabric they are briefly mentioned here. Because, in some cases, communities respond to a given food insecurity situation in more than one way, the paper also includes a few examples of integrated community responses to deal with food insecurity. Policy conclusions are drawn based on these experiences. In all cases of community based response, attempts have been made to relate the contribution of the response to food security (as defined in this study) within the framework of the entitlement and deprivation thesis. It is underscored here that the community responses are not necessarily the most effective basis for responses to food insecurity. And then in many instances, community responses can be facilitated or impaired by policy environment created by the State.

II. Some concepts

The definition of food security used in this paper, based on Mukherjee (2004), goes a step further by specifying that the food available should be culturally acceptable. In sum, this study understands food security as a state where all the following statements are true:

- food is systemically available at all times;
- food that is available is culturally acceptable², where culture is broadly defined to include religious beliefs, customs, usage and practices;
- people have economic access to food;
- people have physical access to food;
- people have social access to food;
- food that people consume has the requisite nutritional value for a healthy life; and
- people have access to potable water, for absorption of food by the body.

¹ The help received from Ms. Sri Angati, Ms. Fetty Prihastini and Ms. Ms. Fransisca A. Wijaya is thankfully acknowledged.

* Dr. Amitava Mukherjee Ph. D. Senior Expert, Macro-Economic Policy and Development Division, United Nations, Economic and Social Commission for Asia and Pacific, Bangkok; and Head, United Nations Centre for Alleviation of Poverty, through Secondary Crops, Bogor, Indonesia.

² The phrase “culturally acceptable” food is to be widely interpreted to also mean, amongst other things, food that meets the edicts religions such as *Halal Food, Kosher Food, Vegetarian Food and Jain Food*.

Granted that, food insecurity exists when one or more of these conditions are unmet. Not only is it important to ensure availability of food but also to guarantee that people have adequate physical, social, cultural and economic access³ to food to meet their dietary needs and food preferences for an active and healthy life⁴.

This paper has not evaluated the community based responses to food insecurity, except to draw broad conclusions. The paper has chronicled community based responses to food insecurity which could inform policy making, either in the form of new ideas or for taking corrective action where warranted, and allow communities to explore ways and means to tackle their problems, to supplement State action⁵. A caveat will be in order. All community based responses are not autonomous; some are led or facilitated processes, facilitated by civil society organizations.

Community based responses to achieve food security are inextricably linked to risks, household responses to risk and shocks that lead to food insecurity (Bhattamishra and Barrett, 2007). They are also linked to seasonal forces and cultural practices. Shocks are either idiosyncratic⁶ – meaning one household's experience is remotely, if at all, related to neighboring households' – or covariate⁷ – meaning that many households in the same locality suffer similar shocks that lead to food insecurity. Covariate shocks causing food insecurity are difficult to insure within a community and thus require some sort of coordinated external response, from the state or financial markets or civil society organisations. Idiosyncratic shocks, however, can be effectively managed within and by a community. Towards that end, communities have developed norms and institutions to reduce risk leading to, inter alia, food insecurity and individuals adopt livelihood strategies that reduce the probability of suffering the consequences of food insecurity. Community based responses, however, only partially reduces overall risks leading to food insecurity. When food insecurity is caused by shock(s), communities usually have some "mechanisms" for providing community based food insurance, as it were, and individuals often enjoy some capacity of self-food-insurance. But these mechanisms may at times fail to prevent people falling into situations of food insecurity.

Apart from the range of community based responses, states have also instituted various insurance systems (like crop insurance and food loan in China), price stabilization (such as the Public Distribution System or the PDS in India) and safety net programmes (such as Cash Transfers in the Philippines) to deal with food insecurity. Such interventions focus overwhelmingly on tackling food insecurity arising from covariate risks such as price volatility like the one that gripped almost all countries in Asia in early 2008, droughts such as the ones that afflicted Viet Nam and Australia in 2007-2008 and earthquakes in China and Indonesia in 2008. However, a growing body of empirical evidence suggests that idiosyncratic risk may be as important, indeed may even dominate covariate risk in rural

³ The lack of access, of all forms, could be temporary, due to, for example, natural disasters, economic collapse, or conflict, or permanent, due to, say persistent poverty and lack of economic development.

⁴ At the household level, food security status of each household lies somewhere along a continuum ranging from highly food secure to very low food secure and can be divided into four kinds. **Highly food secure:** Households have no problems, or anxiety about, consistently accessing adequate food. **Marginally food secure:** Households have problems at times, or anxiety about, accessing adequate food, but the quality, variety, and quantity of their food intake are not substantially reduced. **Low food secure:** Households reduce the quality, variety, and desirability of their diets, but the quantity of food intake and normal eating patterns are not substantially disrupted. **Very low food secure:** At times during the year, eating patterns of one or more members of the household are disrupted and food intake reduced because the household lacked money and other resources for, and faced conditions not conducive to, accessing food.

⁵ This is particularly true in a decentralized system of governance and in a political environment that encourages alternative service providers. (ESCAP, ADB and UNDP, 2005).

⁶ Examples of idiosyncratic shocks are those caused, for example, by crop failures associated with microclimatic variation or localized wildlife damage or pest infestation, illness, disablement and/or death in the household, and one-off events (like loss of property due to fire, theft or burglary).

⁷ Covariate shocks occur because of natural disasters, war, price instability and financial crises to which (virtually) everyone in a community is vulnerable.

Asia (Bhattamishra and Barrett, 2007). How communities respond to the idiosyncratic risks, therefore, deserve attention.

In this study a broad definition of “community based responses” for food security is adopted, to include all coordinated actions put in place and managed by groups for their protection against food insecurity (and its effects). The word “community” is also used in its broader sense, to include individuals and institutions whose relations have an informal and non-market character, who may be linked by lineage, ethnicity, religion, occupation, historical reasons, location of habitations and the like, the key criteria being that a common interest to prevent or circumvent food insecurity binds them together and that their strategies to do so are coordinated. Additionally, the phrase “community-based responses” implies responses adopted by groups, whose management rests with the members of the groups themselves.

In this paper, community-based responses to food insecurity which are formal community-based responses or semi-formal or ‘informal community-based responses, that help food security situations within extended families, ethnic groups, neighborhood groups and professional networks all have been considered. Many community-based responses could be membership based but often facilitated by civil society organisations. These community based responses have also been considered. Since the importance of community relations in both formal and semi-formal community based responses is the key defining feature and because many semi-formal institutions are actually based on traditional, informal responses, this paper is cognizant of such organizations.⁸

Understanding community based responses to food security may be facilitated by an understanding of community perspectives on food security and coping mechanisms, noting that the concepts of food security⁹, well being or ill-being and poverty and livelihood have strong linkages amongst themselves. Quite often they are context specific. Communities define food security, well-being or ill-being and poverty in multidimensional terms. Their criteria often varying from rural areas to urban areas and within rural areas *inter se*. Food security for communities, therefore, has to be looked at from a holistic point of view. The example of well-being ranking depicted in Table 5.1 shows the characteristics of well-being categories compiled from well-being analysis across the Federally Administered Tribal Areas (FATA) in Pakistan during a participatory poverty assessment (PPA) exercise carried out in September 2003.

Table 5.1 Well being ranking from Pakistan

Well-being category			
Well off	Better off	Poor	Very Poor
<ul style="list-style-type: none"> ● Good physique ● Land ● Crops ● 100-150 sheep ● Surplus food (ghee¹⁰, meat, milk) 	<ul style="list-style-type: none"> ● Some land ● 50 sheep ● Good health ● Enough food grain and bread ● Eats 2 meals / day 	<ul style="list-style-type: none"> ● Drinks black tea ● Often hungry ● Many dependants ● Bad health ● Very little land ● 1-2 livestock ● Insufficient food 	<ul style="list-style-type: none"> ● Hungry ● Physically weak ● Landless ● No livestock ● No food ● Low quality food ● Eats dry bread ● Visits others to obtain food ● Depend on <i>zakats</i>¹¹ ● Begs

Source: Adapted from Pakistan (FATA) Report (2003)

⁸ For example, grain banks in India and Bangladesh discussed below are offshoots of traditional hunger-insurance systems found in many villages in South Asia.

⁹ Concepts here connote community’s concepts.

¹⁰ Ghee is clarified butter.

¹¹ *Zakats* mean voluntary donations for the welfare of less fortunate people.

In the perception of the community under reference, then, food security co-exists with health and physique in different well being categories. Those with greater availability of food and access to resources for growing food, like land, crops and livestock, were perceived to belong to higher well being categories relative to those having limited or no access to such resources. The quality (and by implication, the nutritional content) of food, food available and consumption have been closely linked by the community in defining well-being. The well-off are the ones who have surplus of expensive food like clarified butter, meat and milk. In the perception of this community, the better-offs have enough food grain and bread, and eat two meals a day. The very poor are characterized by the prevalence of food insecurity in terms of having no food or having to eat dry bread (hence food of poor nutritive value) and dependent on charity and begging (what in the terminology of the entitlement and deprivation thesis, is “transfer entitlements”).

III. A suite of community based responses to chronic food insecurity

Communities respond to meeting food security needs or tackling food insecurity in many ways. Since food availability, especially in subsistence economies in rural areas, appears to be most critical for the community, production response to increase food availability comes first into the picture. This section contains some examples of production, consumption and storage responses to chronic food insecurity from the communities across the region.

A. Production response from China¹²: Ushering reform of global proportions

In a village where it all began!!

Like other villages, Village Xiaogang, Anhui province, China, went under collective ownership of land in 1956, later becoming the People's Commune. Everyone earned from 1 to 10 work points per day according to the quantity and quality of their labour. A boy could earn up to 2 work points—worth about 1 fen (\$ 0.001), herding the commune's cattle (Li Honggu, 2009). Farmers were forbidden from leaving the commune to work outside but had little interest in agriculture. “Begging could feed them better” (Li Honggu, loc. cit.).

The situation was so bad, that in 1962, among the 34 households in Xiaogang village 60 people had died, succumbing to starvation. Into the 1970s, life barely improved, with the final straw being a severe drought in 1978. That drought pushed 18 famished farmers in the remote village of Xiaogang to do away with the collective farming that had suppressed grain production and left them hungry for years, “even expecting death for it”. (The Economist, 2008). Recalling that fateful night in December 1978, when Mr. Guan Youjiang, (now aged 62) one of the 18 men who pressed their red-inked thumbs onto a crumpled piece of paper to do away with collective farming, said: *'Many of us could not even understand all the words on that piece of paper. But we knew we just had to do it. We had to fill our stomachs, feed our families.'* (Sim Chi Yin, 2008).

In 1978, taking matters into their own hands, the starving farmers of Xiaogang began parceling out their hitherto communal land, cattle and farming tools to individual family units which eventually became known as the household responsibility system (*dabaogan*). At first families were allotted equal plots of land with common access to ponds, through draw of lots (Li Honggu, 2009). But in years of drought, disputes arose over water usage prompting a second land distribution in 1983, which guaranteed a pond for every family. Thus rural reforms began in the late 1978 in the central province of Anhui. In consequence, productivity and grain production rose dramatically as the farmers found new

¹² Source: Sim Chi Yin (2008). “The Village Where It All Began”, The Straits Times , Singapore, December 6, 2008.

incentive to work hard to better their own lot. Though local officials in Xiaogang initially did not approve of this move, it later won the “backing from a provincial leader and Deng ally, Mr. Wan Li. Others gradually followed suit” (The Economist, 2008). Indeed it was at this critical juncture that Deng Xiaoping himself declared that farmers’ decisions should be respected, hailing the new system as “a great creation of Chinese farmers”. (China Daily, 2009). Though the communes were officially dismantled in 1984, by the end of 1982, more than 90 per cent of China's agricultural households had returned to some sort of family farming. By 1984, China had a bumper harvest of 407 million tons of food, making it the first time in years that the country had enough to feed itself. China this year expects a harvest of 528.2 million tons of grain. (China Daily 29 December 2008, P. 1)

'It was like throwing fish back into water,' said Mr. Yan Jincang, now 65 and one of the Xiaogang pioneers. As official accounts of history tell it all, that desperate pact by Xiaogang's villagers not only spurred a tectonic shift in the Chinese countryside, but also silently unwittingly became the first chapter in China's chronicle of its dramatic economic growth and prosperity. Unknown to the Xiaogang villagers, the *winds of change* were also blowing in Beijing, with a watershed meeting of the Chinese Communist Party (CCP) that same month opting for 'socialist modernization'.

The steps that the farmers of Xiaogang took clearly increased the food production and hence food availability in the system. In the absence of enough data it is difficult to definitively establish what kind of entitlement the increase of food production led to. But given that the farmers who were engaged in the process all had land, an increase in food production would have, from first principles, led to an increase in their endowment entitlement.

B. Vertically integrated cropping: production response from Central Asia

This is in village Karatal village, Eskeldinskiy region, Almaty oblast in Kazakhstan, with a population of about 4000 people, dependent on agriculture for their livelihood. Villagers have devised means to maintain food security through multi-layered farming. The village has seen several vicissitudes, including inflation during 2007-2008 which was reminiscent of the 2000 per cent inflation when Kazakhstan got separated from the erstwhile USSR. In 2008, the price of wheat surged 67 percent in just three months, while that of flour jumped 58 percent, leading to a temporary suspension in the country's bread supply (Xinhua, 2008). The price of rice of different varieties of rice has increased from 80-100 Tenge per kg to 160-200 per kg between January and June 2008¹³.

But people are not food insecure, at least apparently. Reference is invited to Figure 5.2 which is a seasonality diagram of food consumption. Consumption of meat (column 1), potatoes (column 2), fruits (column 4), Marconi (column 6) and “salat”, meaning vegetables of different kind varies over the months, while consumption of bread and rice are constant as staple food. A clear substitution effect noticeable: during the winter months the relative consumption of meat and potatoes goes up whereas the consumption of fruits and “salat” goes down, according as the availability and nutritional needs of the season vary. The villagers have three meals all through the year. Generally, the villagers are food secure, both in terms of quantity and nutritional content.

¹³ Field Notes of Dr. Amitava Mukherjee and Mr. Eugene Gherman from their visit to market in neighboring town of Tekeli on 11 June 2008.

Table 5.2 Seasonality of food in village Karatalsk, Kazakhstan

Months	Food	Meat (Beef)	Potatoes	Bread	Fruits	Rice	Macaroni	Salat
January		*****	*****	*	***	*	**	***
February		****	****	*	**	*	****	**
March		****	****	*	**	*	**	***
April		****	***	*	***	*	**	**
May		***	**	*	***	*	***	***
June		**	**	*	****	*	*	*****
July		**	**	*	*****	*	*	*****
August		**	*	*	*****	*	*	*****
September		***	*****	*	****	*	***	*****
October		****	*****	*	***	*	***	****
November		****	*****	*	**	*	***	****
December		*****	*****	*	**	*	**	***

Prepared by: Students: Rustani, Olzhas, Zhandos, Arman, Omar, Kostya, Ruslan, Aida, Tumur, Kirill and Teacher of Physical Training- Mr. Amvar. Facilitated by: Ms. Aiman Kenzhebekova and Amitava Mukherjee. Dated: 12/06/08.

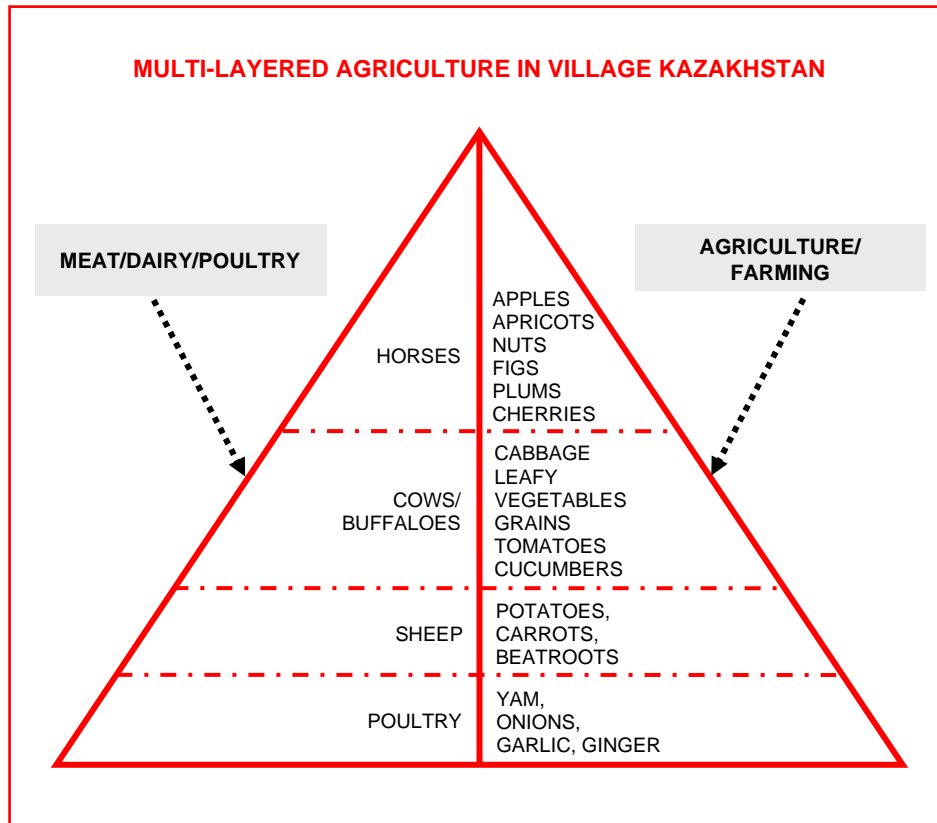
This has been achieved through multi-layered agriculture. See figure-5.1. The agriculturists in the village generally have a two track agricultural production system: one, farming, to produce wheat, vegetables, fruits and tubers and two, allied agriculture, for producing meat, dairy products and wool. In both the systems they have multi-layered farming and production. In farming, they have crops under the ground, on the surface and above the surface. The first layer is the under-ground layer, allowing farmers the space to grow tubers (ginger, onions, carrots, turnips, potatoes). The second layer is the surface, or the ground layer, on which generally cereals and 'other' vegetables like cabbage and green leafy vegetables are cultivated. The third layer is above the ground level, providing people fruits and nuts of different varieties. Similarly in case of allied agriculture, sheep constitute the first layer; the cows the second and the horses constitute the third layer. The general pattern is that sheep are most numerous, followed by cows, with the number of horses being the least in number. Milk is provided by cows and horses. Meat is obtained from sheep, cows and horse¹⁴.

Both systems of production allow the farmers to hold their produce to tide over the difficult months, usually the severe winter months. Meat and milk are saved in terms of live animals whereas non-meat agricultural produce is "saved", within limits, in under-ground storages that last them the year around. Fruits are all preserved as dried fruits. This explains why food basket remains the same all through the year in seasonality diagram (Figure-5.1); only the relative proportions of different components vary according to availability and dietary needs of the season. Significantly enough, because of the multi-layered farming system, the size of the farm land required is not very large.

A relatively small plot of land (say half an acre) would be enough to feed a family round the year, the *effective cultivable* surface being approximately 1.5 acres, when the three tiers are taken together.

¹⁴ A farmer's animal wealth primarily provides him with meat and "shashlik" (shishkebab made of lamb); milk and cheese. He has beshbarmak (boiled onions, carrots, and noodles), fried dough balls and potatoes from his cropping.

Figure 5.1



A real life example of a villager would be useful. Alexandar is a 70 year old farmer, came to the village from Siberia, during the 1950s in the height of agricultural "Virgin Lands" program, which encouraged Soviet citizens to help cultivate Kazakhstan's pastures. He has a triangular piece of land, measuring no more than one third of an acre, adjacent to his dwelling. He practices multi-layered farming. The farmer and his family encountered few problems, if any, in satisfying his food requirements and generate some cash by selling his produce, from the land itself. Significantly, Alexandar obtains most of his food from, not endowment entitlement, but from usufruct endowment. Because the land he is cultivating for the last 50 years or so (he could not recall the exact years), does not belong to him but to the state. He neither pays land related taxes nor is his possession disturbed by the agencies of the state. He is enjoying the usufruct rights; not the title to land; no right to cultivate either. Similarly the grazing land used by his animal stock, belongs to the state.

C. Horizontal integration of crops: circular economy of dyke-pond system in China

The dyke-pond system of crop production is a classic example of horizontal integration of agricultural operations. The mulberry dyke (or sugarcane) fish pond complex is a system developed by farmers in the Pearl River Delta region of China to make full use of available land and water resources to grow food. It is an interrelated ecosystem that brings into full play the productive potential of humans and their environment and promotes the development of different branches of agriculture at the same time. There are six operational elements in the system that is horizontally integrated.

(i) The Pond. The pond is the heart of the system. To produce a pond, soil is excavated and used to build or repair the dykes surrounding the pond. The pond is prepared by clearing, cleaning and fertilization with quick lime, tea-seed cake and organic manure from livestock kept on the dykes. Most

ponds are rectangular, 0.4 to 0.6 ha in area and 2 to 3 m deep. The dykes are usually 6 to 10 m wide, and extend 0.5 to 1.0 m above the surface of the pond. The pond is filled with river water. Water also enters directly as rain and through runoffs from the dykes. Water leaves the pond via the pond drainage outlet in controlled discharges, evaporation and transpiration, seepage into the dykes, and removal when water is drained out at regular intervals over a one year period.

(ii) Mulberry and silkworms. The co-production of mulberry (or sugarcane growing) and sericulture with fish farming is achieved by converting the banks of the fish ponds into mulberry dykes. Mulberry leaves are picked to rear silkworms, from which silk cocoons are harvested, while the wastes of silkworms are used to fertilize the pond to feed the fish

(iii) The pond mud, much enriched in nutrients, as fertilizer for crops. Ponds are drained two or three times a year, and the mud at the bottom is dredged out and put on the dykes. This operation raises the height of the dykes and repairs them as well while at the same time depth of the pond, is restored and siltation prevented. The mud excavated from its pond, is also used for mushroom cultivation, which are often cultivated on the floor of the silkworm shed in winter, the off-season for silkworm production. After the final crop of mushrooms has been harvested, the mud-bed is used to grow vegetables, fruit trees and grasses.

(iv) The Fishes. Various fish species which live at different pond depths, and have different feeding habits, are reared in the pond, to make full use of the water and the pond ecology. The typical poly-culture reared in the pond is a combination of the “four big family fish”: grass carp, silver carp, big head carp and common carp, requiring little or no external input.

(v) Livestock. Livestock is an important link in the circular economy. Pigs, chickens and ducks are reared on the dykes, to provide manure to fertilize the fishponds, and to encourage the growth of plankton that feed the fish. Many of the dyke crops are fed directly to the fish, such as elephant grass for the grass carp, or else to the livestock, such as forage crops for pigs.

(vi) Harvests. With a tropical to subtropical climate, the dyke-pond area is well endowed with sunshine and rainfall, and hence extremely productive, especially with a system that recycles and transforms all the “wastes” into nutrient resources. There are many harvests, fishes, silk cocoons and vegetables being the major ones for the system. Rearing of pigs would be a minor harvest along with livestock such as chickens and ducks as well as mushrooms. But for the farmers fish sales contribute the largest source of income.

The external energy input in the dyke-pond system is minimal, and consists of mainly labour and the energy expended to make farming implements, housing and equipment for rearing silkworms, and machinery and energy to aerate the fishpond and to dredge it. The major energy input by far, of more than 99 percent, is sunlight, and it is renewable and free. However, since the late 1970s, the traditional dyke-pond system of the Pearl River Delta has been undergoing dramatic changes due to the shift away from a collectivist to household production as discussed in Sub-section III.A above and two, an intensification of production following the Green revolution.

The horizontal integration of crops increases the endowment and exchange as also trade based entitlements of the farmers.

D. Ducklings and rice cultivation, a case from Japan¹⁵

The Aigamo method!!

The organic farming method dubbed the Aigamo (name of a crossbreed of domestic and wild ducks) method uses ducklings to provide pest and weed control, oxygenate the rice fields and fertilize

¹⁵ Source: Mae-Wan Ho *et al.* (2008).

rice seedlings, apart from maturing themselves. It is a hybrid of the traditional farming practices of Japanese Rice Farmers and experimentation of the Furano family in Fukuoka, Japan. Stated simply, the agricultural operations simultaneously raise Aigamo ducklings, Loaches (a species of fish), rice, and Azolla -- a nitrate-fixing species of aquatic fern. The ducks are left in the fields 24 hours a day, and do not need to be herded back to a protected pen.

Ducklings are released into paddy fields soon after the seedlings are planted. Ducklings do not eat rice seedlings as seedlings have too much silica. Generally about 20 ducklings are released per tenth of a hectare. It seems ducklings genuinely enjoy getting into the water, paddling between rows of rice seedlings, ducking their heads underneath the surface and then raising their heads to swallow something. These movements are crucial for rice plants producing mechanical stimulation that make plant stems thicker and stronger. The ducks also eat up insects, pests and the golden snail, which attack rice plants. They also eat seeds and seedlings of weeds using their feet to dig up the weed seedlings, in the process of oxygenating the water and encouraging the roots of rice to grow. The ducks are so good at weeding that farmers who have adopted the duckling method now save up to 240 person-hours per hectare in manual weeding every year. Indeed the Furano family has left their fields to duckling for plying and naturally managing their rice paddy cultivation.

The Fukuoka plot also has a patch of dry land amid the paddy fields for the ducks to rest and eat waste grain from rice-polishing factory operations. The ducks stay in the field until the rice plants form ears of grain, and then are removed before they can eat the grains. At this stage, the ducks are confined to a shed and fed waste grain exclusively. The ducks in turn fatten up, lay eggs, and provide meat and are sold in the market to generate market revenue.

The ducks are not the only inhabitants of the paddy field. The aquatic fern, *azolla*, or duckweed, which harbours a blue-green bacterium as symbiont, is also on the surface of the water. The *azolla* is very efficient in fixing nitrogen, attracting insects for the ducks and is also provide food for the ducks. Roaches use the *azolla* as a hiding place from ducks and the plant provides protection for fish that swim in the flooded paddy. The fish feed on duck feces, on daphnia and other worms, which in turn feed on the plankton. The fish and ducks provide manure to fertilize the rice plants all through the growing season.

In short the paddy field with ducks is really a complex, well-balanced, self-maintaining, and self-propagating ecosystem. The only external input is the small amount of waste grain for the ducks, and the out put from the visibly more robust rice plants (as compared to rice plants not under the duck method) is a healthy harvest of organic rice, duck and roach. The rice farming method also shows that organic farming does not have to be labour intensive¹⁶.

Nurturing ducklings in rice fields have the twin effect of increasing rice production and maturing of ducks that lay eggs and provide meat. In addition, the ducks are sold to provide income to the farmers. Thus ducks increase the endowment and exchange entitlements, increase economic access and improve the nutritional value of food of the farmers. The method also contributes to better environmental management as it obviates the need to use chemical fertilizers.

The Aigamo method of rice cultivation increases the endowment and exchange as also trade based entitlements of the farmers.

¹⁶ Today this successful farming method has now spread to many parts of Asia including Republic of Korea, Cambodia, Lao PDR, Viet Nam, Malaysia, the Philippines, and Thailand. Farmers in these countries have increased their rice yield 20 to 50 per cent or more in the first year, with one farmer from Lao PDR increasing his income three-fold.

E. Integrated production responses¹⁷: A case from India

Often food production is linked to availability of seeds, fodder, tools and machineries. These taken one with the other delineate the technology used in agriculture. Thus Fodder Bank, Grain Bank, Seed Bank, and Machinery and Tool Library, to make agriculture more sustainable, covering 40,000 small and marginal farmers in 400 villages, have been formed in the dry desert districts of Kutch, Patan and Surendranagar, India.

(i) Grain Bank

Community members typically experience difficulty in saving grains by themselves (Bhattacharya et al. 2007), probably due to commitment problems (which have been shown to impact savings abilities, in empirical studies from Asia).¹⁸ To circumvent this problem, community members resort to setting up of Grain Banks. The main function of Grain Banks, a semi-formal arrangement¹⁹, is to enable households to save grains to smooth consumption over different periods of time usually a 12 month period.²⁰ The Grain Bank as a grain storage center concept, however, is an old concept in the Asia Pacific Region²¹.

There was a traditional practice in Gujarat of each family contributing a certain amount of grain to a common pool during good time, to be stored in a sealed underground storage system²². In the lean season this stored grain would be retrieved and used to ensure food security. Self Employed Women's Association (SEWA)²³, in Gujarat has facilitated Grain Banks apparently in an attempt to formalize this traditional practice. The grain bank as a grain storage center is built up through local procurement of different grains, through contributions from community in cash or kind (in a predefined amount) and the contributors become members. During difficult times such as droughts or years of poor harvest, the stored grain will be available in the form of loans, at nominal rates of interest, for households in need and to the poor at cost (even during the lean season). The Grain Bank is administered and managed by the local community ensuring local decision-making and control. The Grain Bank, thus, helps increase availability of food throughout the year acquired by the farmers either through entitlement endowment or exchange entitlement especially at times when systemic availability of food is low.

The grain bank also serves to supplement the Public Distribution System (PDS) of the Government. The Fair Price Shops (FPS) under the PDS that provide the poor with essential food grains and other necessities at controlled prices are at times too far from some of the villages or human habitation. In such cases the Grain bank acts as a source of food to those who have no physical access to food grains. Additionally, the Bank can cover shortfalls when FPS shops are either not open or are not well stocked when actual need arises. Cases are not rare where the failure of the PDS to deliver food, lead many women to resort to moneylenders to acquire food. These loans often carry exorbitant rates of interest. Once this happens, the borrower-women find it difficult to come out of their debt and their economic access to food (and other items in their consumption basket) is compromised.

¹⁷ Drawn from Nanavaty, undated.

¹⁸ Ashraf et al. (2006) provide evidence from an experiment in rural Philippines that individuals with time-inconsistent preferences have a higher demand for a commitment savings product, and that by use of this commitment savings product, they are able to increase both short-term and longer-term savings.

¹⁹ Grain Banks flourish both as civil society facilitated programme and as Government sponsored programme.

²⁰ To some extent, grain banks also provide credit as insurance, in that households that are not able to return loans after facing negative shocks leading to food insecurity find their repayment periods extended.

²¹ Parbati Sankar Roy Choudhury pioneered the 'dharmagola' system of co-operative Grain Banking, to avoid famine and scarcity as early as in the late 19th Century in Joyganj in Dinajpur, Goalundo in Faridpur, Nathpur and Shaitghar in Dacca, Bangladesh. And the system worked really well. These grain banks were subsequently officially registered as formal co-operative societies in the second decade of the 20th century. http://en.wikipedia.org/wiki/Parbati_Sankar_Roy_Choudhury

²² This is a practice still followed in some Central Asian countries such as Kazakhstan. The author found this practice as alive in June, 2008 in Karatal'skoe village, in Eskel'dinskii region of Almaty oblast'.

²³ A registered trade union since 1972, is an organization of poor, self-employed women workers, who earn a living through their own labour or small businesses, without regular salaried employment and without welfare benefits like workers in the organized sector.

Box 5.1 Testimony of a Nepali Farmer

A Nepalese woman farmer Hemmaya Bhandari, 22, told UCA News that through the visit to Mymensingh in Bangladesh, she learned the benefits of digging the earth twice before planting and of a community seed bank. What impressed her most was the seed bank, where 64 indigenous varieties of superior quality paddy seeds were stored in mud jars with paddy straw and banana leaves. She learned that the community farmers take paddy seeds from the seed bank for cultivation and then, after the harvest, return double the amount they took

Source: UNCANEWS, 27 August 2008.

(ii) Seed Bank

High yielding varieties of seeds are an important input, for ensuring higher production, pest control, crop disease resistance and higher food production. Under the conditions of rainfed agriculture in many parts of India, availability of improved seeds (read High Yielding Variety Seeds) is the first step to improving food production. Supply of information on quality of seed to farmers is also vital as it may reduce the dependence of many farmers on unscrupulous distribution agents of seeds, pesticides and insecticides. The Seed Banks, managed by the communities themselves, in villages in selected Districts of Kutch, Patan and Surendranagar in Gujarat, have been set up. Seed Banks store good quality seeds which farmers are allowed to borrow on payment of a small interest, at a rate determined by the community. For example, in a village of the Patan district, in 2007 cumin seeds were distributed to 200 farmers at 8 kg of seeds for each farmer. Seeds stored in the seed bank are certified by the Gujarat State Seed Corporation, thus guaranteeing seed quality. The seed banks offer the advantage of repayment in seeds over several seasons and the stock of seed in the seed bank gradually builds up with the interest payments.

The seeds banks are an aid to augmenting the endowment entitlement of subsistence level, and sub-subsistence level farmers to food grains, in that these banks contribute towards increasing total food production for the farmers and in any case increase food availability in the community. For the above-subsistence-level farmers, a seed bank augments the exchange based and trade based entitlements as they may have more food grains to exchange and trade²⁴.

(iii) Fodder Bank

The importance of livestock rearing and dairy in the livelihood of people in general and in disaster and drought prone areas like Patan district, India can not be over emphasized. Livestock is not only the source of draught power²⁵ but also can be an all-weather source of secondary employment and income that improves the economic access of people to food and other items in their consumption basket. However, the quantity and quality of bovine wealth and of milk they yield are directly dependent on the availability of fodder. In the dry and semi arid districts of Gujarat, fodder is a scarce commodity especially in the lean season and its price unaffordable for the poor farmers. And with many farmers shifting to cash crops, the availability of fodder *per se* on the whole is also on the decline. Dairy as a livelihood option of the poor is, thus, receding in the background and forcing many milk-folk to emigrate, and even resort to distress sale of their bovine wealth, making inroads into their economic access to food. To circumvent the problems, SEWA decided to ensure fodder security for its members engaged in dairy activity through Fodder Banks in various districts.

²⁴ The Svalbard Global Seed Vault, preserving crop varieties from over 100 countries, opened on 26 February 2008 in Svalbard, in Norway, to preserve seed samples of the world's crops, guarding against the loss of the planet's biodiversity, is essentially an extension of this idea on a global scale. The vault has the capacity to preserve 4.5 million different samples of seeds (upto two billion seeds in number) for thousands of years. Contributions were received from gene banks around the world, including rice from the Philippines.

²⁵ Draught animals provided by nearly 82 million animals, plough 100 million hectares or 60 per cent of area cultivated in India. (Bansil, 2003).

Fodder Banks collect fodder during years of good fodder harvest and store the same for use in years of drought. Each member of dairy cooperatives (set up earlier), initially deposits an amount of Rupees 200²⁶ with the Fodder Bank, which is managed by poor women community members.²⁷

Funds generated are then used to purchase and stock fodder when it is available. At times when fodder is needed, but unavailable in the vicinity of the village where the fodder bank is located, fodder is procured from other Blocks or Districts where fodder is available in greater quantities. Fodder so procured is stocked and distributed to members during lean periods at cost, making dairy a sustainable livelihood activity, with members using their own resources. For example, in 2003, almost 542 metric tons of fodder worth about Rs.1.9 million was distributed to members, including green fodder, dry fodder and cattle feed. Not insignificantly, the dung generated by the bovine wealth is a source of manure and fuel for small and marginal farmers in that part of the world.

Since dairy contributes to increasing the food availability for the farmers through higher endowment entitlements as well as also increase economic access for those on off-farm employment, fodder banks have a vital role in the agricultural life of small and marginal farmers.

(iv) Tools & equipment library (read Bank)

Small, marginal and landless farmers most often have little or no access to tools and equipment needed for agriculture. Their inability to buy the necessary tools hampers their ability to earn a sustainable livelihood in agriculture. To tackle the problem, a Tools and Equipment Library has been started. The idea of the library is to house different kinds of agricultural equipment such as ploughs, masonry tools, water lifting machines and “heavy” commercial vehicles including tractors to meet the needs and the requirements of a farming community. Participation in the Tools and Equipment Library programme is based on a nominal membership fee which is then used to buy additional tools and equipment, cover repair and maintain the existing tools, and purchase new equipment as the membership grows. Thus the library is self-sustaining with management in the hands of the local women’s cooperatives, and like the seed bank it increases the endowment entitlements of the farming community.

F. Community based irrigations systems

(i) Small scale irrigation: Zanjeras, Philippines: equity the key.

In the Ilocos provinces of the northern Philippines, a typical form of community based irrigation system is the *Zanjeras*. These are small-scale irrigation societies all of whose infrastructure is built, maintained and managed by the communities of farmers, the water users. Land is allocated amongst the farmers in parcels of equal size, the holdings being dispersed between upstream and downstream areas. The even land distribution ensures that the allocation of water as also maintenance obligations are fairly equitable, which has assisted the *Zanjera* system to persist successfully with minimal state interference for over two centuries.

Water is allocated proportionally to the size of the area of the land cultivated as is the size of the input of labour and material that each user must contribute to the operation and maintenance of the system.

State control was introduced in the form of the Water Code of 1976, which asserted state ownership of water sources, and required that all rights to divert water, whether for irrigation or other purposes, be legitimized via possession of a water permit. This intervention has been successful in so

²⁶ 1 US \$ is equal to 48 Indian Rupees (Rs.) approximately.

²⁷ Various training such as how to distribute, weigh and transport fodder, and how to manage the administrative process associated with distribution for numerous villagers were also provided by SEWA.

far as it left intact the traditional, informal systems via which co-ordination and conflict resolution among users of particular irrigation systems are achieved. In some cases, it even provided new opportunities for co-ordination among different *Zanjas* along the same river system, helping in greater efficiency of water allocation. However, there is no recognition of traditional and ancestral claims to usufruct rights over water that have not been officially registered, leading to instances of over-allocation and consequent conflicts between registered and unregistered users. Furthermore, the application procedure for water permits puts the wealthy and powerful individuals in advantageous position vis-à-vis irrigation associations, despite the fact that the wording of the water codes indicates an explicit favouring of collective over private ownership (Cruz, Ma. Conception J., 1989).

(ii) Farmer Managed Irrigation Systems, Thailand: The Local Bureaucrat as the Pivot

Farmer Managed Irrigation Systems (FMIS) before the Establishment of RID²⁸ Farmer Managed Irrigation Systems (FMIS) were typically developed, operated and maintained by groups of farmers (Shivakoti, 2008). The systems were mostly of small scale, optimum to maintain (100-1000 rai), to provide water for good harvest of main rice crop, to make water available during the dry season to reap a second harvest of rice or other crops and to expand cultivated areas. The District Head was the *Agent Provocateur*. The District Head arranged meeting with different sub-district heads and discussed on the most efficiently possible and feasible way for supplying water to different sub-district and villages. The sub-district head then discussed with village head and finally planned work strategies. In order to operate and maintain the system, farmers were organized and formed water user committees, based on canal network.

In the FMIS the irrigation systems were constructed communally using available local materials such as bamboo, logs and stones. When the need for irrigation water arose, the community along with community head identified the source of irrigation water and constructed a weir on a river, to hold back water. Since the weir as well as entire irrigation system was considered as common property, the households had common rights and responsibility for repair and maintenance and hence was governed by customary rules and regulations. Each household was obliged to contribute labor, construction materials and tools based on the size of their landholding and economic status. Given traditionally oriented belief, the households had to collect some funds for annual ritual rites to the weir spirit for the protection of entire irrigation systems.

The water users developed their own rules and regulation. Typically, for maintenance of the irrigation systems, labor contribution was guided by the principle of more land, more labor contribution. Since the people managed irrigation systems were fully constructed and repaired by local materials, farmers were obliged to bring necessary tools and material during maintenance time. The amount and types of tools and materials brought were either decided by the Weir Headman or, in most cases, already agreed upon rules of proportionate to landholding size. As any traditional society is bounded by several belief systems, their mutual understanding and community solidarity has often been reflected in some ritual form. Therefore, each household had to contribute for ritual offering either cash or kind whatever was convenient.

(iii) Weirs and Subaks, Bali, Indonesia: the Temple as the Kingpin

The irrigation systems of Balinese rice farmers achieve coordination of large numbers of individual users covering a wide geographical area without the imposition of central control. Farmers are

²⁸ Source:

organized into associations known as *subaks*, each of whose members share a common irrigation infrastructure, built around weirs (small dams) into which water is diverted from a river. From the weir water is channeled into the canals and aqueducts, which carry it to the fields. Each of these weirs may be used by one or several *subaks*.

Coordination of planting schedules within and among *subaks* is necessary for two reasons. Planting schedules are staggered so that the peak demand for water from all users from a single watercourse is avoided. However, synchronization among fields in the same area is an important part of the pest control strategy. The optimum balance between these conflicting demands depends on specific local conditions, and is achieved in a surprising fashion.

Associated with the physical infrastructure for irrigation is a complex network of shrines and temples dedicated to the worship of the water goddess and various agricultural deities, which provides the basis for coordination of planting cycles within and between *subaks*. Each temple is associated with a single weir, and its congregation is composed of the members of the *subaks* serviced by the weir. The temple hosts annual meetings of representatives of all these farmers, at which a common planting cycle for the year ahead is decided. The temple's ritual calendar provides the basis for the succeeding sequence of agricultural tasks.

Coordination among users of weirs along the same river is achieved via regular exchange of delegates among temples, in fulfillment of obligations associated with ritual ties among the deities to which they are dedicated. This system is finely tuned to local conditions and allows farmers to achieve an optimum cropping pattern. Mathematical modeling of the network's ecological properties suggests that it allows yields to be maintained in the face of crises such as low rainfall or large increases in pest populations, and that these properties depend upon a high degree of coordination of farmers' activities. Interestingly, it appears to have evolved as the outcome of a gradual process of experimentation on the part of individuals over a period of several centuries, rather than the imposition of any central political or religious authority, and is thus an example of coordination resulting from bottom-up organization. Attempts to replace the role of the temples by a bureaucratic system of control following the 'green revolution' of the 1970's led to a loss of the co-ordinating function, resulting in a series of ecological crises (Lansing, 1991) and (Lansing, J.S. and J.N. Kremer, 1993).

All the three community based irrigation system contributes to increasing food production. They thus contribute to increasing the endowment entitlement of the farmers and to the extent that they sell a part of their produce, to their trade based or exchange entitlements as well.

*IV. Talapariges in Gujarat, India*²⁹

Talapariges are unique to areas having sandy soil and a rocky substratum. They are mostly found in the beds of ponds, streams and rivers; some are around them. While the sandy soil ensures ample water percolates during rains and from water bodies, the rocky substratum prevents the water from percolating too deep. During the summer when rivers and ponds dry up, this water, sweet and purified by filtration through the soil, is still oozing out of the *talaparige*.

People dig a pit, five to 15 feet deep, at the site of the spring, build a stone wall around it to prevent the water eye—*jalada kannu*—of the *talaparige* from getting silted, and construct channels along the contours of the surrounding land, providing a gradient for the water to flow. Water from the *talaparige* is supplied for irrigation to tracts of land near the channels. More crucially, underground springs are a source of drinking water during the summer.

²⁹ Adopted from Aparna Pallavi (2010). "Lost and Found", in *Down to Earth*, New Delhi, April 1-15, 2010.

"Before bore wells came along, only land close to a talaparige could grow a second crop," said farmer Sankaraiyah of Karmadi. "Even today farmers who do not have bore wells can rely on the talaparige to see the crop through." Sankaraiyah receives an hour of water supply daily for his ragi³⁰ and paddy crops, each in three hectares, from the underground spring.

A talaparige and its channels are maintained by a community of farmers. The community is headed by a gamkar who calls meetings and initiates maintenance work. A neeraganti coordinates with farmers in distributing water. Water division, as Sankaraiyah showed, is done through a deceptively simple technique of placing rocks at strategic points in the channel to direct the flow. The position of rocks is changed every hour so that everyone gets water," said a farmer, as he carefully packed some rocks at the mouth of one channel, reducing the flow.

In 2007, a Tumkur-based non-profit, Dhanya, conducted a survey in the five districts of the States of Karnataka and Andhra Pradesh, India where underground springs were an integral part of the irrigation system. In the 1950s and the '60s there were some 2,000 underground springs in Tumkur alone, but the study found 150 in the five districts put together. All but 20-30 per cent of these have fallen into disuse.

Decline of the talaparige began with the advent of bore wells, which not only depleted the groundwater, destroying springheads, but also destroyed the fabric of social cooperation. In more recent years, mining, especially sand mining in the beds of rivers and ponds, has destroyed many talapariges. Farmers say frequent monsoon failures and reduced rainfall have also played a role.

It is encouraging to note that a few underground springs, mostly in Koratagere, Madhugiri and Pavagada taluks of Tumkur District, Karnataka, are still in good condition, and their water cooperatives active. Karmadi is one of them.

G. Alternative public distribution system

Different models for Community Grain Banks have emerged in many communities in the region. In one case, a Community Grain Bank in conjunction with reclamation of fallow land and creation of a Community Grain Fund facilitated by an NGO (Deccan Development Society, in Andhra Pradesh) has evolved into what is called an Alternative Public Distribution System (APDS) based in Zaheerabad Mandal³¹, Andhra Pradesh, India where food grain production, procurement, storage and distribution, are done at the community (village) level and are entirely managed by women *Sangham*³² members in 11 villages.

The target groups, drawn from marginal and small farmers, mostly belonging to Scheduled Castes³³ and Backward Castes³⁴, were organized into self help groups, or *Sanghams*. The **programme implementation** started, amongst other things, by advancing loans to the beneficiary farmers for agricultural operations on fallow lands, over a three year period. The total investment for bringing fallow lands under cultivation for all the three years was fixed at Rs. 4200 per acre³⁵. In the **second stage**, the responsibility of collecting and disbursing loan amounts and timely implementation of all seasonal agricultural activities at the village level, were vested in the women committee members in each village. Loan repayment was in the form of grain from the partner farmers after harvesting of crops. Grains collected were stored using traditional storage methods as parts of the *Community Grain Fund (CGF)*. The loan repayments by the partner farmers were spread over a five-year period in the form of grain in

³⁰ A nutritious coarse grain.

³¹ Mandal is a sub-District level administrative unit.

³² A self-help-group in local language is called a Sangham.

³³ They are amongst the most marginalized groups in society. They are also called dalits.

³⁴ They are also marginalized groups in society but a step better than the Scheduled Castes.

³⁵ Rs. is the abbreviation for Indian Rupees. Currently 1 US \$ is equal to Rs. 48 roughly.

prefixed quantities at pre-fixed prices. In the **third stage**, the grain thus collected was stored in the village for distribution during the scarcity months (usually the monsoon season) among the poor households on a *five-point poverty scale* (read level), identified by the villagers themselves based on their criteria evolved through Participatory Wealth Ranking. **Finally**, households identified as above were issued a sorghum card by the Sangham entitling them to a fixed quantity of Jowar at a subsidized price of Rs. 3.50 per kg, the proceeds of which were deposited in a Community Grain Fund *Account* held with a bank. The subsidy of one Rupee, between the issue price and procurement price made up by the interest payments, accruing from CGF Bank deposited in five years. Individual village groups hold the CGF account with the fund used year after year, for reclaiming more fallow lands.

APDS increased food availability, as it yielded additional quantities of different kinds of cereals and pulses, from the fallow lands. Additional labour employment for various agricultural operations and a demand for “bullock-pair-days” created by the APDS increased the people’s economic access to food. APDS has also brought back biodiversity conservation as source of food for local communities and helped revive several varieties of crops, cereals, legumes, pulses and oilseeds, helping in ensuring food security for future generations. Thus the APDS not only helped the farmers to increase their access to food through better endowment entitlements from increased yield, but also improved the nutritional quality of food through increasing bio-diversity which provides them with a whole range of food, hitherto not available.

H. Increasing food availability: accessing food from common property resources

Common property resources (CPRs) (such as lands, forests, wildlife, fisheries, water) may incorporate elements of quasi-insurance by allowing free access to forage food and fodder for both consumption and trade³⁶. Common property resources that involve access on a rotating basis also have a quasi-insurance character. In these cases, community members have equal likelihood (in expectation) of receiving fertile and infertile tracts of cultivable land (in the case of agricultural societies) or equal amounts in expected catches (in the case of fishing communities). For example, in a fishing community in Sri Lanka, access to the biggest catches, which depends on both the time of the day and the location in which nets are cast, is allotted on a strict schedule, such that over time, the expected availability of fish of all fisherman is equalized, thus smoothing out, to an extent, intra-fisher folk households access to food or means to acquire food. (Bhattamishra *et al.* 2007). In another example, in the *warabandi* system of water distribution in rural Pakistan, canal water is distributed to farmers on a rotational basis at pre-specified times during the course of the week (Murgai *et al.* 2002). These traditional rules help households to smooth consumption over time, thereby reducing risk (Plateau, 1991) of seasonal food insecurity.

Common property resources may also be seen to constitute the secondary system for food production and hence a source for food availability³⁷. Food insecure households traditionally intensify the use of the natural resource-base and in particular the common property resources, including forests and rivers, when food production and availability is insufficient³⁸. Similarly in coastal and in areas prone to floods many landless households try to secure their living by fishing on rivers, canals and flooded areas during the flooding season when there are fewer job opportunities. The nature of the CPRs and

³⁶ The possibility of damaging CPRs articulated by Hardin (1968) should be borne in mind.

³⁷ There are two food systems. Rice, potatoes etc, which are food produced by the application of technology in the economic sense, are called food derived from the “primary food system”. Fish, fruits, honey, gums, small animals, birds, tubers, snails, leaves, leafy vegetables etc from the common property resources, micro-environment (Chambers, 1992) and forests, and from gleaning and collecting food from lands belonging to richer, relatively well-off farmers, in neighboring villages, are called food from the “secondary food system” (Mukherjee, 1994a).

³⁸ Food gathered from the CPR can be viewed as usufruct entitlement or entitlement emanating from exchange with nature.

the products collected also varies from urban to rural context. In some cases, it has been estimated that food from CPRs constitutes almost 35 per cent of total food consumed by the poor in arid and semi-arid areas in India. (Jodha, 1986). In Tangail, Bangladesh it has been found that people, belonging to different economic grouping, access from 39 to 89 per cent of their food from CPRs or what they call uncultivated sources (Mazhar, et. al, 2007). The fact that food from the secondary food system is available when food supply from the primary food system was not available or was scarce, has led some experts to call food from the CPRs as “hunger foods”. (FAO, 1984, 2002).

Common property resources (CPRs) (such as lands, forests, wildlife, fisheries, water) may incorporate elements of quasi-insurance by allowing free access to forage food and fodder for both consumption and trade³⁹. Common property resources that involve access on a rotating basis also have a quasi-insurance character. In these cases, community members have equal likelihood (in expectation) of receiving fertile and infertile tracts of cultivable land (in the case of agricultural societies) or equal amounts in expected catches (in the case of fishing communities). For example, in a fishing community in Sri Lanka, access to the biggest catches, which depends on both the time of the day and the location in which nets are cast, is allotted on a strict schedule, such that over time, the expected availability of fish of all fisherman is equalized, thus smoothing out, to an extent, intra-fisher folk households access to food or means to acquire food. In another example, in the *warabandi* system of water distribution in rural Pakistan, canal water is distributed to farmers on a rotational basis and provides turns at pre-specified times during the course of the week (Murgai *et al.*, 2002). These traditional rules help households to smooth consumption over time, thereby reducing risk (Plateau, 1991) of seasonal food insecurity.

The use of common property resources to smoothen out the availability of food over different months is also significant. A longitudinal participatory study of food insecurity and community coping mechanisms in village Rakshit Chak, (inhabited by landless families of Lodha tribe) Midnapore District, West Bengal, India over the years 1993, 1995 and 1998 using food calendars, with women demonstrates that the common property resources, and the rights of the poor to access them, also act as an insurance against a sudden fall in food availability (Mukherjee and Mukherjee, 2008). The study of the food calendar reveals that there are four phases of food insecurity. Phase one covers the period from mid-November to mid-February, when people eat the most. Food insecurity sets in phase two spread over two months, mid-February to mid-April and people eat less. Mid-April to mid-September marks phase three when food consumption is very low. Phase four spreads over the mid-September to mid-November, when a typical diet of poor households consists mostly of rice.

³⁹ The possibility of damaging CPRs articulated by Hardin (1968) should be borne in mind.

Table 5.3 Seasonal food calendar of Village Krishna Rakshit Chak, Midnapore, 1993.

Month	Rice	potatoes	Pulses	Vegetables@@	Fruits@	Food@@ from Water Sources	Others from Wild
1	2	3	4	5	6	7	8
Magh (Mid-Jan to Mid-Feb)	*****	*****	***	cabbage	-	-	wild borums and wild rabbits
Phalgun (Mid-Feb to Mid-Mar)	*****	*****	**	spinach	-	-	neem leaves
Chaitra (Mid-Mar to Mid-Apr)	****	****	**2	pumpkin	-	fish and wild water plants	-
Baisakh (Mid-Apr to Mid-May)	****	***	*	pui leaves and herbs	Mango, jackfruit	fish, snails and wild water plants	-
Jyastha (Mid-May to Mid-Jun)	****	****	**	loti, leaves and herbs	Mango, jackfruit	fish, wild water plants	-
Asardh (Mid-Jun to Mid-Jul)	****	***	***	jhinge (nearer to Sukini), green papaya	-	-	-
Srabon (Mid-Jul to Mid-Aug)	****	****	*****	green papaya	-	-	-
Bhadra (Mid-Aug to Mid-Sep)	****	***	***	green banana	-	fish and snails	-
Ashwin (Mid-Sep to Mid-Oct)	****	***	**	-	-	-	-
Kartick (Mid-Oct to Mid-Nov)	**	***	**	radish, leaves	-	-	-
Ahgrayan (Mid-Nov to Mid-Dec)	****	****	*****	tomatoes	-	-	-

Table 5.4 Seasonal food calendar of Village Krishna Rakshit Chak, 1995.

Month	Rice	potatoes	Pulses	Vegetables \$	Fruits #	Fish \$	Snails \$	Others from Wild \$
1	2	3	4	5	6	7	8	9
Magh (Mid-Jan to Mid-Feb)	*****	*****	***	-	-	-	-	-
Phalgun (Mid-Feb to Mid-Mar)	*****	*****	**	-	-	-	-	neem leaves
Chaitra (Mid-Mar to Mid-Apr)	****	***	-	-	-	-	-	-
Baisakh@ (Mid-Apr to Mid-May)	****	***	-	-	-	-	-	-
Jyastha (Mid-May to Mid-Jun)	****	***	-	-	-	-	-	-
Asardh (Mid-Jun to Mid-Jul)	****	**	-	-	-	-	-	-
Srabon (Mid-Jul to Mid-Aug)	****	***	-	-	-	-	-	-
Bhadra (Mid-Aug to Mid-Sep)	**	-	-	-	-	*****	-	-

Table 5.5 Food calendar, 1998 of Village Krishna Rakshit Chak

Month	Rice	Potatoes	Pulses	Vegetables from CPR	Fruit from CPR	Fish from CPR	Snails from CPR	Others from Wild
1	2	3	4	5	6	7	8	9
Magh (Mid-Jan to Mid- Feb)	*****	****	-	-	-	some fish	-	-
Phalgun (Mid-Feb to Mid-Mar)	*****	****	yes	-	-	fish, jhinuk	-	neem leaves
Chaitra (Mid-Mar to Mid-Apr)	****	****	-	-	-	-	yes	rabbits
Baisakh** (Mid-Apr to Mid-May)	***	***	-	brinjals	-	-	snails, jal geri	jhinge
Jyastha (Mid-May to Mid Jun)	***	***	-	kalmi sak, susmi sak, gim sak,	-	fish	-	-
Asardh (Mid-Jun to Mid-Jul)	***	*	-	wild potatoes, mushroom	-	-	-	-
Srabon (Mid-Jul)	****	*	-	-	-	weeds,	yes	-

There are significant seasonal variations in availability of food like rice, potato and pulses which are from the “primary system of food” produced using technology in the economic sense. For example the consumption of rice the staple food reaches its peak between mid-January to mid- February after which it declines mid-March to mid-April, remaining stationary through mid-September to mid-October. The consumption of rice remains low throughout the summer months. Secondary food which primarily comes from CPRs provides valuable additions to the food basket of the poor in form of fiber and animal protein, adding nutrition to the diet of the food insecure villagers. In the lean period (mid-March to mid-September), when food from the primary system is low, the villagers access CPRs to cope with food shortages. Access to the CPRs like water bodies can make a significant difference to the quality and quantity of food available. For example, in the village, a huge tank called Rajbandh was not auctioned in 1998 by the local body due to a dispute, which allowed local villagers had access to tank and could collect a number of food items. While auctioning of CPRs like tanks provide resources to the local bodies, it also means that the insecure households are deprived of food in lean periods.

The food insecure villagers in addition to collecting, hunting and gathering food from the CPRs, also glean food from the land of richer farmers. Vegetables like cabbage, pumpkins, ridge gourd (*jhinge*), papaya, green banana, radish, tomato and brinjals not harvested by the rich farmers as they are damaged due to pests, hail storm etc are picked by poor families and help to cover their food insecurity to some extent. Both systems of food play critical roles in providing food to the villagers of Krishna Rakshit Chak. Figure 5.2 also gives glimpses of the extent of substitution of grains etc takes place with food from the CPRs.

“Foraging” of food from common property resources is widely practiced. For instance for the Karen Community in Thailand, foraging of food like “fishing, hunting and gathering of food from natural habitats”, constituted one of three main pillars of food procurement. (Chotiboriboon *et al.* 2009). Similarly the Ainu, an indigenous people who live in Northern Japan, collected substantial amount of food from the common property resources. In fact in the three component of food, two came from common property resources, namely wild vegetables and fish and wild game. It is noteworthy that the food from

common property resources provided protein and many vital nutrition which they may not get from cultivated grains. (Goodman *et al.*, 2009). See Table 5.6.

Table 5.6 Collection and preservation methods of some AINU traditional foods

Food names	Collection and preservation methods
Wild vegetables	
Wild onion	Collect in April to mid-May, dry them by the end of May
Anemone	Collect in beginning of May to mid-May, dry them by mid-June
Udo, spikenard	Collect in mid-May to mid-June
Japanese butterbur, coltsfoot	Collect in beginning to mid-June, dry them by the end of June
Angelica, fresh	Collect in mid to the end of May
Aha bean	Collect in beginning to mid-Nov, dry them by mid-Nov
Ostrich fern, fiddle head fern	Collect in mid-April to mid-May, dry them by mid-May
Perennial lily	Collect in mid-June to beginning of July, preserve them by mid-July
Cultivated grains	
Egg millet	Seed them in mid-May, weed in mid-June, harvest in end of Sept. to end of Oct. dry them by mid-Nov.
Barnyard millet	Seed them in mid-May, weed in mid-June, harvest in end of Sept. to the end of Oct., dry them by mid-Nov.
Italian millet	Seed them in mid-May, weed in mid-June, harvest in end of Sept. to end of Oct., dry them by mid-Nov.
Frozen potatoes	Collect them in mid-April in the vegetable garden, soak in water and dry them
Fish and wild game	
Freshwater pearl	Collect them in summer in fresh water mussel
Dried salmon	Cut salmon into three (borne and top and bottom sides) and dry salmon outside in the cold
Hokkaido deer	Catch and cut in mid-Jan.

Source: Goodman Masami Iwasaki, Satomi Ishi and Taichi Kaizawa. (2009).

It is noteworthy that one study deems the phenomenon of poor people's scavenging food from left-overs in markets in urban areas, akin to rural poor foraging in the CPRs. (Brocklesby *et al.*, 2001). The fact that "left-overs" partake the nature of food from common property resources is because they can be accessed by anybody without demur and recourse. This is not an uncommon sight in many parts of South Asia, Cambodia, Lao PDR and Viet Nam. Box 5.2 is a brief description of this phenomenon.

Box 5.2 Use of proxy-common property resources in urban Viet Nam, Bangladesh and Nepal

Assessment carried out by the Center of Development Studies in Viet Nam pointed out that scavenging in markets for leftovers was the urban equivalent of relying on CPRs in rural areas. Analysis across PPAs showed that the urban poor rely on all sorts of CPRs for their survival from scouring rubbish and garbage dumps to growing food on scraps of roadside lands and near railway tracks.

The social differentiation in the use of and reliance on CPR for survival was visible here also. Use of and reliance on CPRs was considered to be predominantly a female option. Any decline in the condition of and availability of resources from the CPRs directly and adversely affects women. The study also found that apart from women, the same applies to other very poor community members, for example 'untouchables' in Nepal or ethnic minority groups in Bangladesh.

Source: Brocklesby and Hinshelwood, 2001.

i. Increasing the Nutritive value of food: Use of NTFP to Diversify Food Base.

In most developing countries of Asia and the Pacific, rural and poor people depend on non-timber forest produce (NTFP) *inter alia* for food, fodder, fuel, medicines, gums, resins and material for shelter. Apart from consumption, NTFPs are also important traded commodities in local to national (and in some cases even international) markets. Proceeds from sale of NTFPs at the local markets contribute to the ability of the people, especially the poor, to obtain basic needs and provide employment. A study carried out within the framework of the EC-FAO Partnership Programme "Information and Analysis for Sustainable Forest Management: Linking National and International Efforts in South Asia and South East Asia" compiled information for 15 Asian countries at the national level on NTFPs. It revealed that while cereals and food grains form the staple food for the majority of the population, there is a growing in

importance. And the role of NTFPs not only in increasing the availability of food in the lean period but also in diversifying the food basket of the poor at normal times.

NTFPs contribute in two ways to enhance the food security of poor households. One, it increases the available quantity of food in line with the use of CPR to increase food availability discussed in section H above and two, it increases economic access to food, otherwise not available, by sale of NTFPs⁴⁰. Food from NTFPs increases the nutritive value of the food and adds palate to the diet of the poor; apart from increasing the total quantum of food available to them. Accessing food from NTFPs is, therefore, akin to increasing the total food availability through augmenting the usufruct entitlement of the poor or through exchange entitlement with nature.

As an example reference is invited to Table 5.6 which shows the main categories of forest foods, recorded in field surveys in Lao PDR, depicting the rich biodiversity and diversified food base of NTFP. A total of 708 NTFPs from plants and animal sources were identified including 238 varieties of plant based NTFPs food, and 470 sources of food from animals of different kinds.

Table 5.6 Diversifying food base through NTFPs in Lao PDR

Srl.	Category	No of products	Examples
1	Fruits, seeds	87	Sugar palm fruits, baccaurea berries, Irvinga nuts
2	Leaves	86	Barringtonia, lasia, azadirachta, centella
3	Shoots	23	Bamboo shoots, rattan shoots, palm hearts
4	Tuber, roots	22	Yam tubers (dioscorea), ganga roots
5	Mushrooms	16	Ear mushrooms, shii take, termite mushrooms
6	Flowers	4	Sesbania, butea
	All plants	238	
1	Fish	300	Cyprinidae, pangasiidae, siluridae, notopteridae
2	Birds	63	Dove, partridge, pheasant, bulbuls, estrildas
3	Mammals	54	Squirrels, wild boar, rats, civet rats, mouse deer
4	Reptiles, amphibians	41	Frogs, monitor lizards, snakes, turtles
5	Molluscus	7	Freshwater shrimps, crabs, snails, shells
6	Insects	5	Red ant eggs, bamboo grub, dung beetles
	All animals	470	
	Total	708	

Source: Foppes and Ketphanh (2004).

I. Food storage and protection

(i) Indigenous method of storage

Food storage is critical in the food consumption chain. However, loss in storage of food in the Asia-Pacific region is significant. For example, in some countries like Sri Lanka almost 40 per cent of the food produced is lost in storage and transmission⁴¹ and in Bangladesh it is as high as 20 per cent⁴². Preventing wastage of food is tantamount to food production. Hence communities, especially, farming communities in Asia and the Pacific attach a lot of importance to devising and using good food storage systems. The advent of, and progress in, sophisticated post-harvest technologies are a manifestation of this phenomenon. Judged in that sense, food storage is a means to keep intact the availability of food in the system and prevent its diminution.

⁴⁰ NTFPs, such as aromatic oils and medicinal plants are also traded nationally and internationally and can achieve high prices in comparison with NTFP traded in local and even provincial markets. Since this Paper is concerned with only community based responses to food insecurity, the issue is not explored any further here.

⁴¹ Dr. W.G. Somaratne, OXFAM (Australia), during the discussion at the "South Asian Civil Society Forum on Responding to Food Insecurity in South Asia" South Asia Watch on Trade, Economics & Environment (SAWTEE), in Kathmandu on 24 October 2008.

⁴² Mr. Atiur Rahman, Dhaka University during the discussion at the "South Asian Civil Society Forum on Responding to Food Insecurity in South Asia" South Asia Watch on Trade, Economics & Environment (SAWTEE) in Kathmadu on 24 October 2008.

Modern food storage techniques and methods are highly complex involving a series of processes to prevent the loss of quantity, quality and nutritional value of the food stored⁴³. However, these facilities are generally available in the urban and peri-urban areas. The poor and generally food insecure communities across the region, therefore, do not often have access to these facilities mainly due to cost implications and location of such storage facilities. The communities facing food insecurity, have in many cases, developed their own systems and mechanisms to deal with food storage so that wastage is minimized and the quality and nutritional value of the food stored remains intact. Within these systems are also specialized techniques suitable to different agro climatic zones and crops. The methods of handling, packaging, storing and transportation and also their final consumption vary according to nature of the crop for ensuring maximum utilization and least wastage. Examples of indigenous food storage structures in Himalayan regions of India (Verma, L.R. et al,1998) are instructive where food grains like maize, wheat and paddy are stored in special containers made of bamboo called *Peri* or *Peru*. Prior to use, these containers are plastered on the inside with a mixture of cow dung and clay. These containers are placed in a separate room called *Overi* on the ground floor of the house and grain is loaded into them from a hole made on the roof of the ground floor called *Baurh*. To take out grains, as needed, a special opening is provided near the bottom of each *Peri*. Access to *Peri* is limited to very few people in the household. The use of bamboo containers allows the free flow of air inside the grain, and locating containers on the ground floor ensures cooler temperature during the period of storage. Loading grains from top and unloading the same from the bottom makes the handling of stored material easy and consequent losses in handling is kept at a minimum. Additionally, keeping the food storage structures away from the main living space protects the grain from potential fire hazards.

In some other parts of the Himalayan region, grain is also stored in wooden structures known as *Darauntha* and are kept away from the main living spaces. *Daraunthas* made of deodar wood are preferred as deodar wood inhibits the entry of insects and larvae. Wooden houses built away from living quarters check the entry of rodents and other pests. Windows with wire mesh, provide adequate ventilation. The size of the store house for each household is proportional to the size of land holdings. In some parts of Lahaul & Spiti, Northern Himalayas, special earthen rooms are constructed for storing cereal crops immediately after harvest. Storage in such rooms also helps keep temperature cool, so essential for the storage of grains. Poor farmers in some parts of temperate Himalayas, have grain storage chambers made of bamboo. These are built outside but within safe vicinity of the farm house. The logic behind constructing these storage houses and rooms at some distance from the family units (also made of wood) is again to save the food grains from common fire hazards.

As stated earlier, food saved is food grown. Efforts invested in setting and maintaining a good storage system, thus, increase the availability of food in the system. In that sense, a good storage system has the effect of increasing different kinds of entitlements of the people, irrespective of the entitlement through which food was accessed in the first place.

(ii) Food protection responses

The success of a food storage system in many communities depends on how well they can protect their food. An important dimension as a coping mechanism is the use of indigenous and locally available material as pesticides and insecticides to protect food grains from wastage. Communities, who suffer from chronic food insecurity, also invest resources and time to protect their food grains from insects, mildew and dampness, irrespective of how the food was acquired. Extensive use by communities in Asia of leaves from trees having antimicrobial and pesticidal properties for protection of

⁴³ Transportation losses have been well documented.

stored food grains has been well documented. The Neem Tree (*Azadirachta Indica*) is an example in point. Neem has been known for centuries for its natural and comprehensive pest control properties. Neem is a tropical tree and grows in semi-arid climates in Asian countries. It is almost completely free from insects and pests due to the presence of the active compound 'Azadirachtin' (tetranortriterpenoids) that acts as a growth regulator or anti-feedant. Use of Neem has been a common practice in rural Bangladesh, India and Pakistan to protect the stored grains by mixing their grains with dried Neem leaves. In 1994 the European Patent Office granted the US corporation W.R. Grace a patent on Neem as a 'method for controlling fungi on plants by aid of a hydrophobic extracted Neem Oil' (Downes, 2003).

Like a good storage system that prevents wastage of food, food protection is also tantamount to producing food. Food saved from insects during storage is food grown. Efforts invested in protecting food from mildew, insects, rodents and the like, thus, increase the availability of food. In that sense, as in the case of a good storage system, steps to protect food, has the effect of increasing different kinds of entitlements of the people, depending on how people accessed food in the first place. As a matter of fact, good storage and protection of food are often conjoined activities in the farming chain.

Box 5.3 The ubiquitous use of the UN "Tree of the 21st century" in tropical agriculture in Asia

Neem is planted in many parts of Asia: Bangladesh, Burma, Cambodia, India, Indonesia, Iran, Malaysia, Nepal, Pakistan, Sri Lanka, Thailand, and Viet Nam. It has recently been introduced in China (Hainan Island).

Neem cake is applied to rice and sugarcane fields against stem borers and white ants since 1930. The mixing of Neem leave (2-5 per cent) with rice, wheat and other grains is still practiced in some parts of India and Pakistan and farmers still put green twigs and leaves in rice nursery beds to produce robust seedling and simultaneously ward-off attacks by early pests-leafhoppers, plant-hoppers and whorl maggots. It has been a common practice in rural India to improve the storage of grains by mixing the grain with dried neem leaves.

In the 1960s Indian scientists reported the feeding-deterrent property of Neem seed kernel suspension against desert locust. Subsequently, several bioactive ingredients (particularly *meliantriol* and *azadirachtin*) were isolated from various parts of the tree. These findings aroused worldwide interest in the bioactivity of the Neem tree. People all over the world are concerned about the safety of food that is treated with pesticides. Using extracts of the Neem tree instead is a promising options, which is why the United Nations declared the Neem Tree as the "Tree of the 21st century".

Source: <http://agroextracts.com/default.htm>.

J. Community based provisioning of basic services: community based information system

Community based information system is used to reduce crops loss and hence increase food availability: food saved is food grown. An example of community based information system that reduces the risk of loss of crops (read food) is the cyclone warning system in Bangladesh, which is visited by devastating floods every year during the monsoonal rains. The community based information system in Bangladesh is based on a network of 33,000 village based volunteers who are alerted via radio stations linked to Dhaka of any impending flood. The volunteers relay the warning through megaphones to villages at risk in the coastal areas. The villages take preventive action. This reduces the loss of crops and stored food. (Miyan, 2008).

K. Self Help Groups and Micro-Credit

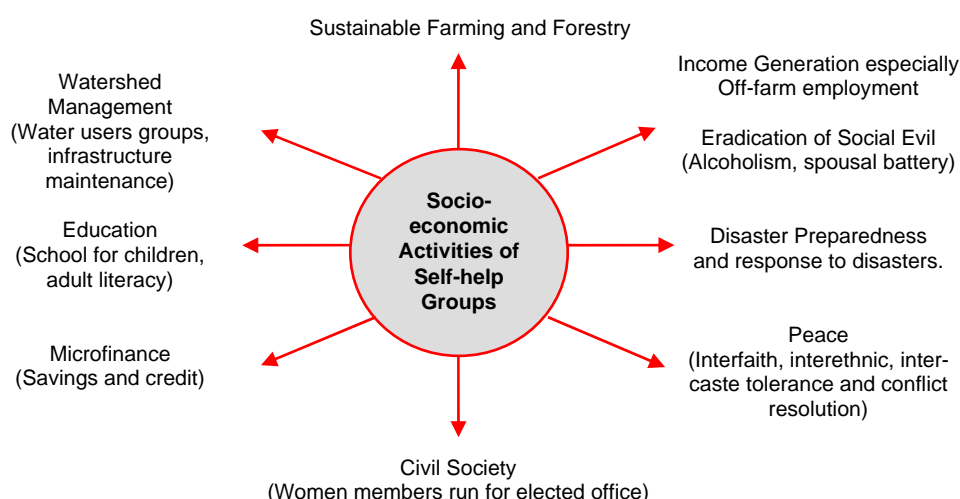
Self-help Group and micro-credit are also important community responses to food insecurity. A SHG is a village-based financial intermediary which could be either a registered or unregistered group of micro entrepreneurs (typically 10-15 local residents especially women) having homogenous social and economic backgrounds, voluntarily coming together to save regular small sums of money, mutually agreeing to contribute to a common fund and to meet their emergency needs on the basis of mutual help (Wilson, 2002). The group members use collective wisdom and peer pressure to ensure proper end-use of credit and timely repayment. This system eliminates the need for collateral and is closely related to that of solidarity lending widely used by microfinance institutions. Funds may be lent back to

the members or to others in the village for any purpose at agreed flat interest rates. Self-help groups are, thus, seen as instruments for a variety of goals including empowering women, developing leadership abilities among poor people, increasing school enrolments, and improving nutrition and food security, as shown in Figure 5.2. As discussed in this paper, SHGs have been used for alternative public distribution system in Medak District, India; for grain, seed and fodder banks in Bangladesh and Gujarat, India; and even managing community based irrigation system in Bali, Indonesia, the Philippines and Thailand.

The link between micro-finance lent through SHGs and food security are clear. There are three channels through which micro-finance affect food security. (Zeller *et al.*, 1997). The *first* is through the familiar poverty-reducing path of improved income generation. The effects are that loans temporarily enhance a household's productive human and physical capital and then, savings and credit services increases a household's risk-bearing potential, leading to the adoption of potentially more profitable income-generating activities, though more risky ones. The profitability and mix of productive activities may change, leading to increased income that contributes to the virtuous production and investment cycles, that increases economic access of people to food. *Secondly*, micro-finance contributes to food security by decreasing the rural household's cost of self-insurance. Improved access to credit, savings, and insurance services can induce changes in household assets and liabilities. For example, the holding of non-remunerative physical assets, such as cash, jewelry, staple foods and livestock, to meet with unforeseen contingency may decline. The sale of productive assets at low prices under distress, like the ones seen in Nepal and Bangladesh discussed in Section IV. D of this paper, may decrease, and the storage of crops for later sale at higher prices may rise. Reductions in the cost of stabilizing consumption will release resources to buy more food and promote investment, thereby increasing the economic access of poor people to food. *Thirdly*, consumption credit is critical for households attempting to smooth consumption over time, by adjusting their disposable income. In the event of adverse shocks, such as bad weather, accidents and illness, rural households use traditional consumption smoothing measures such as the emergency sale of assets, depletion of stocks and inventories, and grants and loans from family, relatives and the informal sector, which could be inefficient and bind households into social relationships that discourage savings and income generation. Micro-credit, savings and insurance services may help households smooth consumption so they use fewer traditional methods.

Self-help groups are common in India, though SHGs can also be found in other countries, especially in South Asia and Southeast Asia. For example, in Bangladesh, Grameen Bank have 6707000 active borrowers (96 per cent of whom are women) with an average loan of \$ 79. It also has 7411229 savers with an average saving of \$ 37. (The MIX Market, 2009). The SHG movement in India represents one of the largest microfinance initiatives in the world, with over 1,000,000 self-help groups with 17,000,000 members formed in early 2000. (Ashe, 2002).

Figure 5.2 Socio-economic Activities of a Group



IV. A suite of community based responses to transitory food insecurity

A. Increasing Economic Access

(i) Exchange responses: internal migration for increasing economic access to food

Migration is categorized here as increasing economic access under exchange responses due that those who migrate for food usually earn either money or goods (usually food grains) in exchange for labour. The money so acquired is exchanged for, *inter alia*, food. Judged in this perspective, migration increases the *exchange entitlements* of the emigrants but can easily be categorized under distress responses. Income earned through labour migration can also be an important means of acquiring land and agricultural machinery, in which case migration increases endowment entitlements of the migrants.

Though, migration in search of alternative livelihoods is a widespread coping mechanism adopted by the food insecure communities across the region the benefits of migration for food security may vary from country to country. For example, in the case of Tajikistan one study found that "labour migration has allowed a significant part of the Tajik population to escape from starvation stemming from economic stagnation and massive unemployment" (Olimova, 2005). Mongolia provides another example of food security-related migration. Migration out of Kerala, India, on the other hand, has enabled the migrants to improve their dwellings in their hometown and villages.

Migration can be either seasonal or long term. In almost all countries of the region, there has been an explosion in short-term migration for work, not only across countries but also within countries.

The substantial movement of women as part of this process is relatively new in the Asia-Pacific region, especially as women are increasingly moving on their own. The presence of women in migration streams, whether into towns or into other rural areas for employment generally signals extreme distress (Hugo, 2005). Whatever may be the form of migration, it exposes households to new risks in the periods of food insecurity such as social exclusion, discrimination linked to their places of origin, inadequate housing and poor living conditions, low wages, sexual exploitation in case of women and lack of access to various basic services.

Box 5.4 Engaging in Seasonal or Long-term Migration in Viet Nam

For people with few other alternatives, seasonal or long-term migration in search of wage labour is a strategy to cope with shocks and earn wages primarily for satisfying food clothing and minimum needs of life. Migration is both an individual and a household risk management strategy since remittances may provide important security to rural households exposed to production risk in the agricultural economy. In the Red River and Mekong Deltas, men and women from vulnerable households often migrate to urban areas (such as Hanoi, Hai Phong and HCMC) for short periods for work to earn wages.

Landless labourers in the Mekong Delta occasionally move to towns with their entire family to find employment when seasonal agricultural jobs in their home area are exhausted. This allows them to earn wages to meet their basic needs like food and clothing.

While migration is evidently a crucial way for vulnerable households in rural areas to increase their earnings or cope with events such as landlessness, migration also exposes households to new risks

Source: ESAF (2004).

It needs to be underscored, that in many cases of migration the returns that an individual gets from the migration may not make up for their toil and the costs are often quite high in terms of bad health, broken families and deepening of their debt burden. The losses in terms of destabilization in social capital may also at times be significant in that when migrants emigrate new groups are formed and social equations change. Emigrants returning home may find that the aged, vulnerable and infirmed who were left behind have suffered deterioration in health and nutritional status.

Take the case of migration in China as an illustration (Shaohua, 2005). In China migration has developed as a major coping mechanism, to seek non-agricultural work opportunities, escape poverty and hunger. Migrant labourers mostly come from China's underdeveloped western and central provinces such as Sichuan, Anhui, He'nan and Gansu, and mainly head to urban areas, south-eastern coastal locations and metropolises like Beijing and Shanghai, and nearby townships, surrounding counties, small cities and provincial capitals. According to the estimates available for 2003 there were 114 million rural migrants in China constituting 20 per cent of the total rural workforce for the country. It is further estimated that by 2020, another 100 to 150 million "surplus" rural labourers will join the rural labour migration workforce. Women account for around 1/3rd of the total rural migrants' workforce and their numbers are also on the increase. (Zissis, 2007).

Around 70 per cent of the migrants are in the age group of 16-35 years and, on an average, do not achieve more than junior middle school level education, spending around 9 years in school. They earn a monthly income ranging from 300 Yuan (US\$ 36) to 600 Yuan (US\$ 72). And most migrant labourers are employed in jobs which are generally considered dirty, dangerous and difficult (what is called '3D Jobs') and which local inhabitants may be unwilling to take.

Like in other parts the Asia-Pacific region, migration also exposes the migrants to new risks in the towns and cities in terms of residency certificates, legal rights, health care, skill training, housing and social integration. As a result many of the migrants fall further into the poverty trap after migrating. Women face even greater difficulties and adversity leading to their increased vulnerability though their experiences as migrants promotes better social status and gender equality for them. In the process, today, migrant labourers in China significantly contribute to the development of industries, such as construction, commerce, food, services and sanitation. The total contribution of labour migration from rural to urban areas has been about 16 per cent of the total growth of China's GDP over the past 20 years. (Harney, 2008).

(ii) Child labour: increasing economic access

Common mechanisms of meeting food insecurity is a cut down on consumption expenditure which include withdrawing children from school, and increasing household labour inputs through employing the children as child laborers, thus increasing the household economic access to food. Children are seen as providing pairs of hands which at least feeds for their own food and earn scarce

resources to the family to survive. The lack of perceived relevance of education and cost associated with education, even though in most countries education is free, frequently contributes to the increased number of child labour.

Figure 5.3



Geographically Asia-Pacific region contributes 64 per cent of all working children globally. Working children engage in various types of activity regardless of their hazardousness and suitability, and it is reported that around 70 per cent of the working children are in the agricultural sector, 22 per cent in services sector and 9 per cent in industry including mining, construction and manufacturing.

Saving money to access food in the short term, by taking children out of school and placing them as labourers, does increase economic access to food. However, on the downside it exposes children to risks such as work related accidents and exploitation⁴⁴ and engagement in unskilled jobs, the last restricting their choice of future livelihood options to low paid jobs, trapping them in long term poverty cycles and food insecurity. Across the region children once forced into child labour are often unable to extricate themselves from the drudgery, and more often than not living a life of bare subsistence. Figure

⁴⁴ The working hours of children are usually long with no or very little cash payments as wages. The wages are generally paid in form of food grains and occasional clothing and in some cases shelter, all of questionable quality.

5.3 (from Kumar 2002) depicts the time line of a child labour from an Indian village showing how the typical child spends his years and the negligible returns he gets in exchange for his childhood. Similarly Box 5.5 captures the story in a narrative form of a real life example. Such responses clearly indicate the need for dual policy, one that addresses immediate familial needs for food and one for the long-run such as investments in children's education so that they can escape from poverty.

Box 5.5 Life of Panchawak Baag

Panchawak Baag is a child labourer from Khairmal village in Bolangir district in Orissa, India. He dropped out of the school while he was in Class III at the age of 7-8 years and has been working since then. He was forced to come out of school and start working due to extreme poverty in his family and acute food shortage.

Panchawak has been grazing livestock since he started working to ensure food for himself and generate some surplus for his family. This assured him of two meals a day, one in the morning and another in the evening. In addition he also got some clothes and some paddy which came as a handy support for his family. Until the age of 12 he used to get one lungi (loincloth) every year along with additional paddy and thereafter 2 lungis and additional paddy. Panchawak's life has been restricted to livestock grazing and in turn having two meals a day to stay alive. He does not have any other options to break the cycle of poverty which trapped him at an early age limiting his possibilities in life. Panchawak is not a unique case.

Source: Kumar, 2002.

In the short run, child labour may improve the food security of the child and may be even the family of the child, through increasing exchange entitlements. However, because all other basic needs like education and health care get a backseat, the long term food security of the child is jeopardized, through damaging their long term trade and exchange entitlements.

B. Increasing economic access: private transfers and remittances

Transfers as a mechanism specifically for hunger insurance include many examples of traditional institutions in the developing world of the Asia and Pacific. In general, private transfers of cash, food and clothing are seen frequently across the developing world.⁴⁵ A recent analysis by Cox et al. (2006), using comparable data from 11 low and lower-middle income developing countries including some from Asia, finds that in 8 of these countries, 30 to 50 per cent of households are involved in private transfers, either as donors or recipients. The study also finds that transfers form a significant portion of household incomes. The existence of reciprocal gift-giving, which can help in reducing food insecurity, where 'gifts' are sensitive to shocks that lead to food insecurity or to the observed income or expenditure level of individuals, is also fairly widespread in Asia. For example, the importance of private transfers in Viet Nam is well known in helping people in distress to access their basic needs including food. Private transfers in Viet Nam partake the nature of means-tested public transfers, flowing from better off to worse off households and providing old-age support in retirement.

Changes in private transfers appear responsive to changes in household pre-transfer income, demographic changes and life-course events. Transfer inflows rise upon retirement and widowhood, for example, and are positively associated with increases in health expenditures. In countries like Kyrgyzstan, private transfers are predominantly from older to younger households. It also appears that inflow of private transfer increases for households affected by natural calamities. For example, private transfers increased significantly to households affected by Typhoon Linda, which devastated Viet Nam's southernmost provinces in late 1997. During the 2005 Earthquake in Pakistan, remittances were initially disrupted by the earthquake, but they have significantly increased in the year following it (State Bank of Pakistan 2006).

Private transfers in the form of remittances emanating from migrants, both internal and international, constitute an important means of increasing economic access of people to food, especially

⁴⁵ Transfers may also be for purposes other than risk-management to ensure food security.

vulnerable groups like elderly people, women and children, and the sick who are left “at home”⁴⁶. Globally, flow of fund from migrants are predominantly used for household consumption (not investment and saving), typically to satisfy the basic subsistence needs of the household, such as food, clothing, medicines, education and housing (Meyers, 1998). For instance in Bangladesh remittances which counted for more than half of household income of recipient families, were used for these purposes. Increased expenditure on food and housing and rising levels of living, combined with other benefits, also often lead to development of human capital, as was found, for example, in the Pacific Islands and Pakistan (Ghosh, 2006). Indeed in Pakistan remittances are predominantly used to meet daily expenses such as food, clothing and health care; however, funds are also spent on building or improving housing, buying land, cattle or durable consumer goods, the repayment of loans for migration and to fund pilgrimages to Mecca (Shahbaz, 2007). Notably, given the stability and reliability of the flow of remittances, they play a significant role in ‘consumption smoothing’ for the poor. While other forms of income for the poor households, may vary and be unpredictable, income from remittance is relatively constant and allows the poor households to absorb shocks and unexpected expenses. Judged at from that perspective, remittances from migrant worker partake the nature of insurance for use at times of need.

Overall remittances of different kinds do increases the economic access of the recipients to food. They are in the nature of transfer entitlements.

C. Consumption responses

(i) Reducing consumption

Like production related community based responses, consumption related community based responses take several forms. Reduction in consumption is at the core of consumption related responses. These could be reduced food intake through smaller portions in each meal or reductions in the number of meals. Consumption adjustments can also be made by increasing the number of people consuming a given basket of food. The many variations of the phenomenon include migration, ‘eating away from home’ during the hungry seasons, marrying off daughters early, giving up children for adoption or, in extreme cases, ‘sale’, of children, abandoning old people or other vulnerable individuals (Swift, 1993). For example, due to the widespread and severe financial crisis in Indonesia in the late 1990s, food consumption dropped substantially and households reduced investments in health and education, all of which had long term implications for food insecurity.

Similarly during the 2007-2008 food-fuel crisis, the poor community’s first response to the situations in the form a cut in food consumption was seen in several countries of the Asia-Pacific region. Box-5.5 from Sri Lanka is a good example of this phenomenon. A cut in consumption as in the example of Sri Lanka as a coping mechanism adopted at the community level violated the first condition necessary for food security: *food availability*. Speaking at the opening session of a workshop in Nadi, Minister Pokotoa Sipeli from Niue said “Higher food prices force poor islanders to reduce consumption of foods or buy cheaper foods of poorer quality and low nutritional value” (Reliefweb, 2008).

⁴⁶ The quantum of remittances can be very large in some cases. For examples, remittances from the US to Asian countries like India were approximately 26 billion US \$, to Philippines was approximately 14 billion US \$ and to China was approximately 23 billion US \$ in 2006-2007.

Box 5.6 Higher food prices, fewer meals in Sri Lanka

Food in Sri Lanka is widely available mainly because of high imports of essential items to meet local demand. Out of the total food consumption basket in 2004, about five per cent of paddy, 30 per cent of potatoes and 78 per cent of dried milk were imported from abroad. These figures indicate that there is sufficient food at the national level. However, prices are increasing. "In recent months, food prices in Sri Lanka have more than doubled," said Sarath Fernando during the BBC World Debate in February 2008. "About half the population of Sri Lanka is living in a situation where prices are beyond their economic reach."

Rising food prices in 2008 meant rising food insecurity in Sri Lanka at the household level, hitting the poorest Sri Lankan people most. Impact assessments conducted in an IFAD-supported project revealed that poor rural people have adopted a range of consumption based coping strategies to face food insecurity: reducing the number of times they eat; altering the amount and the type of food they eat; adopting seasonal migration and mortgaging and selling properties and other assets jeopardizing their future earning capacity and hence food security. The first two coping strategies can lead to malnutrition. The fourth coping strategy can push poor people further into an unending cycle of food insecurity.

Farmers represent about 70 per cent of the rural Sri Lankan population. The rising food prices of 2007-2008 have affected the farmers as they are also consumers. Ironically enough, therefore, farmers (the primary food producers) are themselves curtailing consumption and running into food insecurity in the face of rising price and falling real incomes.

Source: Herath, 2008.

Contemporary studies from Bangladesh also show that the percentage of households resorting to limiting food portion sizes as a coping strategy has increased over the past 3 years. In one study, 74 per cent of the households interviewed in 2008 said that they have limited the size of their food intake at mealtime (among other coping mechanisms) as compared to only 51 per cent in 2006. More recently, in four Upazilas and two urban slums of Dhaka, it was found reduction in consumption of nutritious food was a coping strategy to deal with increased prices of food in 2008 (Raihan, 2008). In about 87 per cent of the rural households their children faced health related problems due to lack of nutritious or quality food while the corresponding figure was 75 per cent for urban areas.

There has been a cut in consumption even by farmers in relatively prosperous communities. Box-5.6 is a short description of how the farming community in Fujian in China responded to the sharp rise in food prices in 2007-2008. Additionally the smaller farmers' diet in Fujian underwent a change in terms of dietary contents. Significantly, while the Sri Lanka example demonstrates that the coping mechanism adopted at the community level led to a loss in *food availability*, the response of the communities in China show that they suffer from food insecurity as the *nutritional value* of the food consumed was reduced.

Box 5.7 Poor Chinese farmers sell and buy less in response to rising food prices

For consumers (buyers) in China, food prices increased by 23.3 per cent between February 2007 and February 2008. Prices varied amongst different provinces but generally meat and meat products prices increased by 45.3 per cent. Oil price increased by 41 per cent and Vegetable prices increased by 46 per cent. Soybean and maize prices increased by 24 and 15 per cent, respectively. Livestock prices increased by 31.4 per cent. The price of pork increased by 45.9 per cent, of eggs by 16 per cent and of milk by 6 per cent.

While farmers in China overall benefited from increased food prices, poor rural farmers generally lacked the capacity to adjust their production to this trend and were vulnerable to price fluctuations. In Fujian Province in 2007, poor farmers actually reduced their sale of agricultural products during the first half of 2007 as the price of food increased. As a result, their income from selling agricultural products dropped by 3.7 per cent during the first half of 2007.

Higher food prices forced poor rural people to reduce their consumption of food like meat and oil. Poor farmers in Fujian Province reduced their consumption of pork by 15 per cent and eggs by 20 per cent. These farmers additionally bought food that was available at a lower price, usually of poorer quality and of lower nutritional value. The poor farmers in Fujian now tend to consume more of their own agricultural products, thus reverting to subsistence agriculture.

The relatively better off farmers were expected to produce more agricultural products and raise more livestock to take advantage of higher prices that China saw in 2007-2008. However, for them, a fair part of the additional income they earned from selling grain at a higher price was lost due to the increased cost of production. For example, the increased price of pork enabled a farmer to sell a pig for an additional 300 Yuan (US\$ 43). At the same time, the increased price of piglets and feed almost matched the increased sale price of a pig.

In China, food continued to be freely available and the grain harvest had been average and above average during the last few years. But, the price rise of 2007-2008 created problems for the poorest members of society, who were unable to afford the price of more expensive food.

Source: Sun Yinong (2008).

There are also instances of food insecure households cutting down on all other expenditure in order to meet food requirements. Curtailing expenditures including cutting down on expenditure on health, clothing and hygiene, results in the further deterioration of physical conditions of people and their capacity to maintain their livelihoods for accessing food in future.

(ii) Discrimination in consumption

In coping with food insecurity, discrimination in allocation of food to different members within the households or what is called *intra household prioritization in food allocation*, is quite common. Women generally come last in the priority in intra household allocation of food in almost all the food insecure communities of Asia-Pacific region. "Discrimination against women and girls is an important basic cause of malnutrition" (Manuliak,1999). Dreze and Sen remarked, "There is indeed considerable direct evidence of neglect of female children in terms of health care, nutrition, and related needs, particularly in North India". (Dreze and Sen, 2002). There was similar evidence found in Bangladesh. (Chen *et al.*, 1981). In some societies widows are worst affected. (Chen, 1999, Dreze and Sen 2002).

Quite often the practice of 'maternal buffering' is also observed where mothers deliberately limit their own intake of food in order to ensure that men and children in their households get enough to eat. A Participatory Poverty Profile Study in Bolangir district of Orissa in India reflects this practice⁴⁷. According to the study, the male members of the family who were considered to be the bread earners in most households consumed proportionately more food than other members in the family. Gender discrimination discussed in the foregoing paragraph, was quite visible in intra household allocation of food during the study, in terms of the quantity of food. Amongst men *inter se* those in the age group of 18-45 years consumed the maximum quantity of food, as both men and women claimed that men's work involved a greater amount of physical labour. However, men belonging to the age group 45-65 years consumed less food than their children in the former age category as the work done by them was usually less arduous than their children. Similarly women in the age group of 18-45 years consumed more food than the elderly women in the family (age group of 46-65 years) as most of them have to breast feed their children⁴⁸. Girls in the age group of 15-18 years ate less than their counterparts but more than girls of similar age if they worked as wage labourers. Figure 5.5 (PRAXIS, 1998) depicts intra-household food distribution among men, women, boys and girls of different age groups among various caste categories in Dudkasira village of Bolangir district of Orissa, India. *The size of the circles in the figure indicates the quantum of food consumed in ordinal terms.* The allocation of food in Dudkasira Village may not be scientific and reflects gender discrimination.

These coping mechanisms did not lead to any increase in food availability or of entitlements of the community but allowed the households in the community to manage the allocation of food amongst its members from the available food basket.

D. Multiple coping responses

Communities facing prospects of food insecurity may adopt multiple coping responses. Community based responses to food insecurity vary depending upon the seasonality, severity of food insecurity and failure of access to primary sources of food. In a study of impact of food price rise during 2007-2008, in selected areas of Bangladesh (Raihan, 2008), covering 4 Upazilas⁴⁹ and two slums in Dhaka city, found seven major coping strategies of the households, namely, (1) reduced savings (2)

⁴⁷ Bolangir may be a limiting case. Nevertheless it has important lessons.

⁴⁸ It must be noted however, that the need for additional calories of pregnant and lactating women may not have been taken into account and the work they do may not be considered "work" for purposes of food entitlement.

⁴⁹ Sub-District level administrative unit.

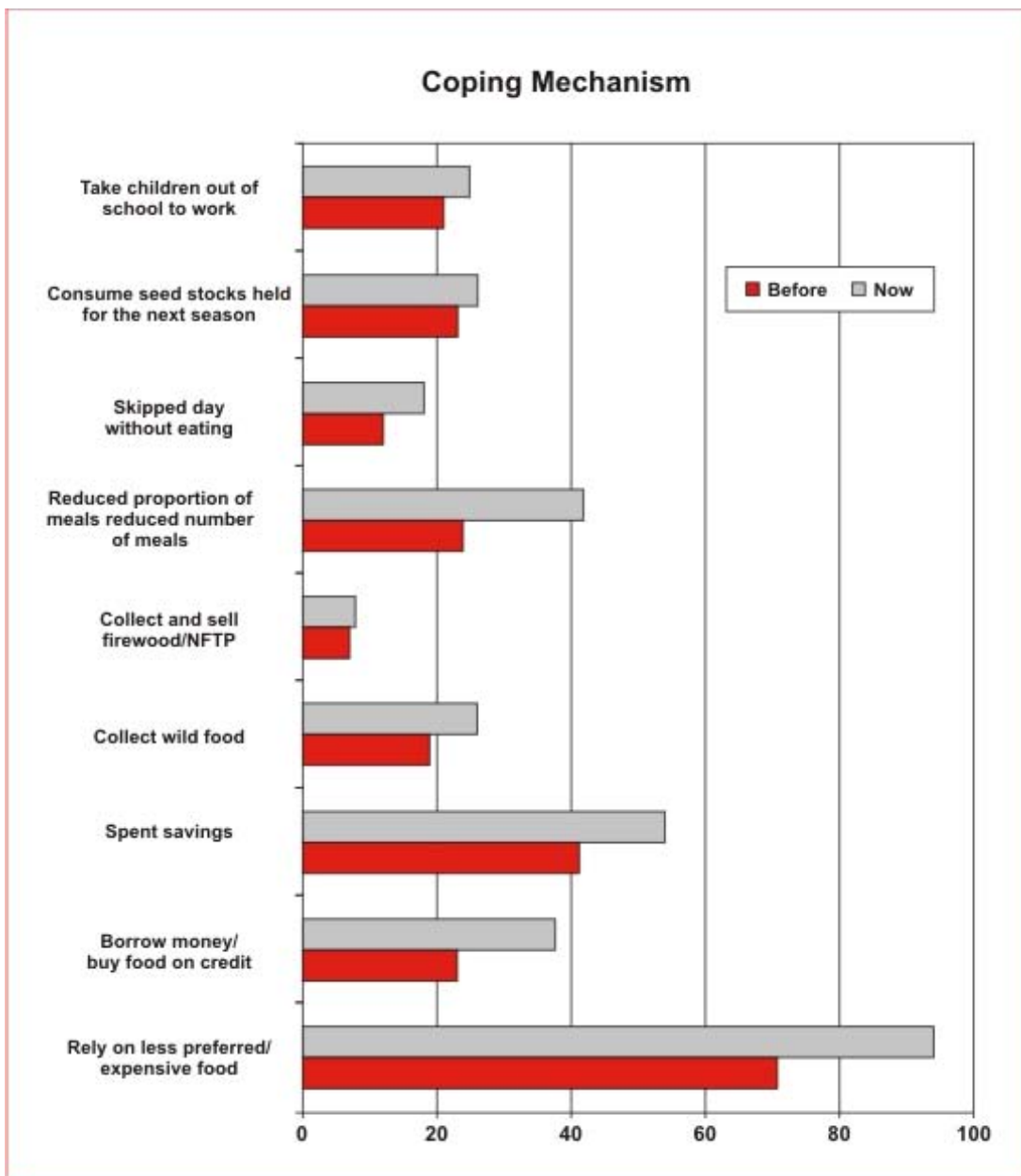
selling assets, (3) mortgage of assets and land, (4) taking loans, (5) reduce non-food expenditure, (6) reducing food intake, and (7) early marriage of daughter. Amongst the coping strategies, 'taking loans' was the most used technique to fight against the price hike. In one Upazila, as many as 85 per cent of the households surveyed resorted to taking loans to cope with the adverse food security situation obtaining in 2008. Almost 9 per cent and 6 per cent of the households in the rural and urban areas respectively reported that they had to cut their consumption of food and 14 per cent and 8 per cent of the rural and urban households respectively sold their assets to cope with the food fuel crisis. A few households were even forced to arrange early marriage of their daughters.

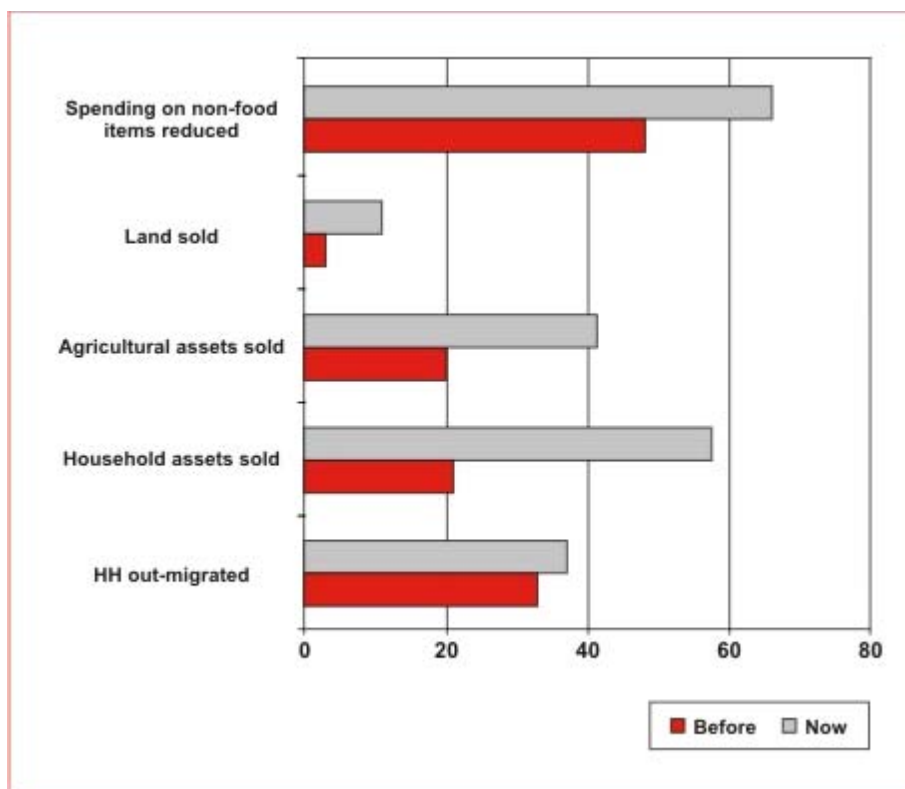
Food prices have also seen a sharp rise in Nepal, as in many other counties in the A-P Region, during 2007 and 2008. Amongst other reasons, the hike in food and commodity prices in 2007-2008 and closure of markets due to disputes over transport tariffs have increased the severity of the food insecurity in the country. The Food Security Monitoring and Analysis System of the World Food Programme (WFP), in 2008, using survey data from the previous 12 months, made a comparative analysis for the Emergency Food Security Assessment in Nepal, in nine districts of the country which were previously identified as being severely affected by drought. It found that most responses which cause long term damage to food security of the community, including borrowing money (presumably from unscrupulous money lenders), purchasing food on credit and migration have increased (See Figure 5.4). Alarming, a high proportion of the population was increasingly selling land, household and agricultural assets, and resorting to increased out-migration (UNFWP, 2008). Figure 5.6, also shows a significant increase, over a 12 month period, in taking children out of school to work, consuming food stocks held for the next season, skipping days without eating, reducing proportion of meals and or reducing number of meals, collecting of wild food, spending of savings on food, borrowing money or buy food on credit, relying on less preferred or less expensive (but poor quality) food and reduced spending on non food items.

The disposal of household assets emerges as a very important response for households facing extreme food scarcity, not only in Nepal but in different countries in Asia. The all too common problem gets more compounded in cases of food insufficiency triggered by natural disasters like flooding, where the alternative options of obtaining food also become limited or non existent. A study done in Bangladesh over the flood and non flood periods in 1997 and 1998 demonstrated that not only did poorer households had limited assets to sell to access food but also that they had to sell whatever they had. The study also found that people hold on to their productive and valuable assets till there is no other alternative left for them (Nino, 2001). Sale of assets was a measure of last resort.

Figure 5.4 Changes in coping behaviour in Nepal

Figure 5.4 Changes in coping behaviour in Nepal





Source: UNWFP, 2008.

The people embarking on multiple coping responses as in Nepal above have a resonance of entitlements in their approaches as well. For example, sale of assets, land or agricultural assets or pulling children out of schools are attempts to access more food through greater exchange entitlements, though admittedly at a cost. Collection and sale of fuel-wood from CPRs is also an attempt to access more food through greater exchange entitlements. Unfortunately, in cases, where augmentation of present exchange entitlements to food is attempted, through sale of agricultural assets and pulling children out of school, they may have the ultimate effect of jeopardizing future endowment and or exchange entitlements.

V. Distress Measures

Under conditions of food insecurity many communities get down to adopting drastic measures like selling assets, land etc as illustrated earlier, but they also resort to distress measures like sale of body organs and being trafficked with some resorting even to suicide. Distress measures are strictly speaking not community responses but are in most cases individual responses to desperate intra-household poverty and food insecurity situations. Nevertheless they are mentioned in passing as they have serious social implications and warrant policy interventions in more than one ways.

A. Induced into Commercial Sex

Being induced or trafficked into commercial sex is one of the extreme responses adopted to cope with food insecurity and poverty, a phenomenon visible in almost all the countries in Asia. In some the process is made relatively easier as it has evolved over time and because social and cultural norm do not explicitly militate against such activity (Dalrymple, 2008). These are in addition to cases where uneducated and unsuspecting girls who do not know how to protect themselves are trafficked by people they trust, including relatives or neighbours, on the promise of finding them lucrative employment in the

city or abroad. These hapless women end up working in brothels and are forced to pay off large sums of money which the trafficker paid their parents. (IRIN, 2008, 2008a)

B. Suicides

Suicide as the last measure to cope with food insecurity (amongst others) is not a very uncommon phenomenon in the region. Suicide as a distress measure, however, often entraps the affected family further into the conditions of food insecurity of an even pernicious variety. With the main bread earner of the family often gone, the family has little to fall back upon. In extreme cases farmers' indebtedness and failure to discharge their liabilities have resulted in suicides, as seen in some parts of India (Government of India, 2007 and Sharma, 2004) and less so in China (The Strait Times, September 2004), South Korea (USA TODAY, 2005)⁵⁰ and Sri Lanka (Sunil, 2005)⁵¹.

VI. Advantages and limitations

Community based responses to improve food security have a number of advantages. First, community participation often results in improved targeting outcomes (Coady *et al.*, 2004). A cross country survey of safety net programmes across many developing countries, find that those which involve beneficiary communities, local groups and local NGOs achieve better targeting outcomes (Subbarao *et al.* 1997). A comparison of PDS in India with a system like the APDS discussed in this paper illustrates the point. Secondly, community-based responses, have an advantage of low information and enforcement costs. In addition, in community-based responses, both unwritten and informal contracts can be self-enforcing as the short-term benefits from renegeing contract are much smaller than the long-term costs to those who renege. (Coate and Ravallion, 1993).⁵² Thus, community-based responses can overcome problems of moral hazard and contract enforcement that often plague state administered responses and insurance contracts.

Community-based responses have their problems as well. There may be holes in the community safety nets. Certain sub-groups – commonly including the poorest households or individuals and women, persons with disabilities and the voiceless – are often excluded from groups that benefit from responses and enjoy limited, if any, advantages of community based responses with others in their community. Group formation for coping with food insecurity, or for that matter any other purpose, is voluntary and endogenous, and may potentially excludes important sub-group(s), such as women, religious and ethnic minorities and those at the bottom of the pyramid. The exclusion of women is especially remarkable because, they have such a key role in production, harvesting, storing and processing of food. Therefore, some commentators have pointed out that community typically is the community members with the most power (Bollier, 2006) and, by implication, corner most of the benefits.

Then there is the potential inability of community-based responses to manage food insecurity arising from covariate risk. Community-based responses may fail in the wake of natural or manmade disasters (such as the Sichuan Earthquake in China in 2008 or the Tsunami that hit Bandar Aceh,

⁵⁰ According to the Korean Peasants League, at least six Korean farmers committed suicide November 2005. USA TODAY. 2005.

⁵¹ The overall suicide rate per 100,000 populations in paddy rice growing districts was 34.33 in 2000; 34.83 in 2001; 31.41 in 2002, 29.04 in 2003 and 35.91 in 2004. See Sunil (2005).

⁵² This does not deny the possible role of a 'moral economy' in tribal or peasant societies which define solidarity as a moral obligation and subsistence as a right. In fact, as discussed by Fafchamps (1998), social norms of mutual assistance can serve to increase the costs of renegeing on (unwritten) contracts, thereby lowering enforcement costs, making informal insurance and moral economy explanations mutually reinforcing, not necessarily strict substitute explanations. On a related note, Platteau *et al.* (1997) argues that traditional mutual insurance systems are based on 'balanced reciprocity' rather than 'conditional reciprocity' which characterizes modern insurance systems, implying that members of these societies are not necessarily always motivated by altruistic reasons.

Indonesia and other parts of Asia on the Indian Ocean in 2005). These are situations in which poor households have limited resources for self-food-insurance and often cannot avail themselves of local risk sharing systems. In addition, the efficacy of informal community based responses to deal with food insecurity varies inversely with the severity of co-variant shock because risk sharing may break down in the face of more severe shocks such as the ones seen during the 2008 food crisis in Asia. An important limitation of community based responses is also their relatively small size and paucity of resources, both human and financial.

VII. Conclusions

Poor populations are vulnerable to several shocks that could lead to food insecurity. Where food insecurity may have already existed and is compounded by the threat posed by sudden adverse shocks (such as the Asian Tsunami in 2005), there is considerable return through improved *ex ante* risk management and providing improved coping strategies through insurance and insurance-like responses. Communities throughout the Region (as in other parts of the world) are commonly seen to take these tasks upon themselves, bonding together to reduce the risk to food security and to provide informal mutual insurance within the group, through various means. It is important to recognize such behaviors and they merit reinforcement.

Most people who are food insecure are the ones who suffer from idiosyncratic shocks. There is a need, therefore, to hear the voices of the poor. Though the community based responses respond to localized risks, nevertheless their wider propagation has substantial potential. As discussed earlier, much of the agricultural reform in China that began in the 1980s was stated by 18 farmers in a village in Anhui Province. It is both a lesson in history and a tribute to the Chinese leadership of the time who recognized the great potential in the small move of the 18 farmers.

In many cases the food security situation would be worse, but for community based responses. The successful examples of community managed responses to cope with food insecurity need to be disseminated for their wider replication and adoption. These may be second best options in many situations but, several of these, taken one with the other, also form a critical element in the whole scheme of managing food security in the Asia-Pacific region.

Because the cost involved in community based responses is low but their sustainability higher, they have a lot to commend themselves. In resource poor economies where large scale macro interventions for food security like the ICDS Programme in India or the Food Loan Programme in China, are not possible, low cost community based interventions could, at least in the interregnum, hold great promise.

Despite a range of threats, the system of communal management and what comes under the more general term of common-pool resource management, still offers a convincing and appealing option for management, as opposed to more commonplace emphases on state- or market-driven modes of regulation (Ostrom, 1994). However, as mentioned earlier, because there may be gaps in coverage in community based responses to food insecurity, special safety net programme for the potentially excluded group should be in place. Further, population increases in many countries of Asia, greater economic and geographic mobility of many Asians, and increased exposure to covariate shocks associated with natural disasters, war and macroeconomic crisis (as the one in 2008) place growing strains on community-based responses as a guarantee to food security.

In case of co-variate shocks the State must act decisively or else people take recourse to damaging coping responses. Additionally, mitigation as also prevention of food insecurity that are not

born out of lack of food availability, like gender discrimination, needs wider and deeper social policy interventions.

References

- Ashe, Jeffrey (2002). *Self-help groups and integral human development*. Waltham, Mass., Brandeis University and Catholic Relief Services.
- Ashraf, Nava, Dean Karlan, and Wesley Yin. (2006). "Tying Odysseys to the mast: Evidence from commitment savings product in the Philippines", *Quarterly Journal of Economics* 121, no. 2 (May 2006).
- Banil, P. C. (2003). "Demand for Food Grains by 2020 AD", in Mahendra Dev, S. et. al (eds.) *Towards a Food Secure India*, New Delhi, Manohar Publishers and Distributors, 2003.
- Barrett, Christopher B., Christine M. Moser, Oloro V. McHugh, and Joeli Barison. (2004). "Better Technology, Better Plots or Better Farmers? Identifying Changes in Productivity and Risk among Malagasy Rice Farmers", *American Journal of Agricultural Economics*, Volume 86, No. 4, pp. 869-888.
- Bhattachamishra, Ruchira and Christopher B. Barrett (2007). "Community-based risk management arrangements: An overview and implications for social fund program design" Cornell University, Working draft, October 1.
- Bhattachamishra, Ruchira. 2007. *An Institutional and Impact Analysis of Village Grain Banks: Evidence from Tribal Orissa*. Ph.D. dissertation, Department of Economics, Cornell University.
- Bollier, J (2006). "Environmental Wealth and Gender Justice", 22 May accessed from www.onthecommons.org.
- Brocklesby, Mary Ann and Hinshelwood Emily (2001). *Poverty and the Environment: What the Poor Say – An Assessment of Poverty – Environment Linkages in Participatory Poverty Assessment*, Center for Development Studies, University of Wales Swansea.
- Chambers, Robert (1992). *Micro-environment Unobserved*, Gate Keeper Series Publication, London, International Institute for Environment and Development
- Chen, Lincoln, Emdadul Haq and Stan D'Souza (1981): "Sex bias in the family allocation of food and health care in rural Bangladesh", *Population and Development Review*, Volume 7, No. 1, pp. 55-70
- Chen, Martha Alter (1999): *Widows in India*, New Delhi: Sage Publications
- China Daily (2008). "Bumper Harvests Lift Farm Income", 29 December 2008, p.1.
- China Daily (2009). "Enlighten Policies spread the wealth", *China Daily*, 13 January, pp. 18.
- Chotiboriboon, Sinee, Sopa Tamachotipong, Solar Sirisai, Sakron Dhanamitra, Suttalak Smitasiri, Charana Sappasuwan, Praiswan Tantivatnasathien and Pasamail Eg.kontrong (2009). "Thailand: food system and nutritional status of indigenous children in a Karen community", in Kuhnlein, Harriet V., Bill Erasmus and Dina Spigelski: *Indigenous People's Food System*, Rome, FAO and Centre for Indigenous Peoples' Nutrition and Environment.
- Coady, David, Margaret Grosh, and John Hoddinott (2004). *Targeting of Transfer in Developing countries: Review of Lessons and Experience*. Washington DC: World Bank

- Coate, Stephen, and Martin Ravallion (1993) "Reciprocity without commitment: characterization and performance of informal insurance arrangements" *Journal of Development Economics* Volume 40, pp 1-24.
- Cox, Donald, Emanuela Galasso and Emmanuel Jimenez (2006). *Private Transfers In A Cross Section of Developing Countries*, Center for Retirement Research Working Papers, Boston, Center For Retirement Research at Boston College.
- Cruz, Ma. Conception J. (1989). "Water as common property: the case of irrigation water rights in the Philippines", in Berkes, Fikret and Carl Folke (eds.) (1998). *Linking Social and Ecological System'*, Cambridge, Cambridge University Press
- Dalrymple, William (2008): "The Daughters of Yellamma" in Negar Akhavi (ed.) *AIDS Sutra, Untold Stories From India*, London, Vintage Books
- Downes, Gerard (2003). Implications Of Trips For Food Security In The Majority World, Dublin, *prepared for Comhlámh Action Network, October 2003*
- Dreze, Jean and Amartya Sen (2002): *India: Development and Participation*, New Delhi, Oxford University Press.
- Economist (2008). "Briefing China's Reforms, The second Long March", *The Economist*, 13 December, pp.30.
- ESAF (2005). *Food Insecurity and Vulnerability in Viet Nam: Profiles of Four Vulnerable Groups*, Food Security and Agricultural Projects Analysis Service (ESAF) ESA Working Paper No. 04-11, ESAF, Viet Nam.
- ESCAP, UNDP and ADB (2005). *A Future within Reach, Reshaping institutions in a region of disparities to meet the Millennium Development Goals*, New York: United Nations.
- Fafchamps, Marcel, Christopher Udry, and Katherine Czukas (1998). Drought and Saving in West Africa: Are Livestock a Buffer Stock? *Journal of Development Economics*. V55 (n2): 273-305
- FAO (1984). *Food and Fruit Bering Forest Species 2: Examples from South Eastern Asia*, Forestry paper No. 44/2, Rome, FAO.
- FAO (2002) *Non-Wood Forest Products in 15 Countries Of Tropical Asia: An Overview*, FAO, Bangkok.
- FATA PPA Team (2003). *Between Hope and Despair*, Pakistan Participatory Poverty Assessment: FATA Report, Pakistan
- Foppes, J and Ketphanh, S (2004). *NTFP use and household food security in Lao PDR*, Paper prepared for the NAFRI/FAO EM-1093 Symposium on "Biodiversity for Food Security", Vientiane, 14-10-2004.
- Ghosh, Bimal (2006): *Migrants Remittance: Myths, Rhetoric and Realities*, Geneva, International Organization for Migration.
- Goodman Masami Iwasaki, Satomi Ishi and Taichi Kaizawa. (2009). "Traditional food Systems of Indigenous Peoples: the Ainu in the Saru River region, Japan" in Kuhnlein, Harriet V., Bill Erasmus and Dina Spigeliski: *Indigenous People's Food System*, Rome, FAO and Centre for Indigenous Peoples' Nutrition and Environment.
- Government of India (2007): *Report of the Expert Group on Agricultural Indebtedness*, New Delhi: Banking Division, July
- Hardin, Garrett (1968). "The Tragedy of the Commons", *Science*, Vol. 162, No. 3859, December 13, pp. 1243-1248.

- Harney, Alexandra, CNN, "Migrants are like China's factory without Smoke". 3 February 2008, accessed on 28 December 2008, from <http://www.cnn.com/2008/WORLD/asiapcf/02/01/china.migrants/?iref=newssearch>.
- Herath, Anura (2008). "Higher food prices, fewer meals in Sri Lanka" in *IFAD: Making a Difference in Asia and the Pacific*, Issue 21, June-July
- Hugo, G (2005). *Migration in the Asia-Pacific region*, Paper prepared for the Policy Analysis and Research Programme of the Global Commission on International Migration, USA.
- Integrated Regional Information Networks (2008), Pakistan: "Women suicide cases on the rise - but why?", *IRIN NEWS*. June, retrieved from <http://www.irinnews.org/Report.aspx?ReportId=78948>.
- Integrated Regional Information Networks (2008a). "Indonesia: Poverty at root of commercial sex", *IRIN NEWS*. July retrieved from <http://www.irinnews.org/report.aspx?ReportID=79441>
- Jalan, Jyotsna, and Martin Ravallion (1999). *Are the Poor Less Well Insured? Evidence on Vulnerability to Income Risk in Rural China*. Policy Research Working Paper 1863, Washington, DC: World Bank.
- Jodha, N. S. (1986). "Common Property Resources and Rural Poor in Dry Regions of India, *Economic and Political Weekly*, Volume 21, No. 27.
- Kumar, S (2002). *Methods for Community Participation: A Complete Guide for Practitioners*, Sage, New Delhi
- Lansing, J.S. (1991). *Priests and Programmers: Technologies of Power in the Engineered Landscape of Bali*, New Jersey, Princeton University Press.
- Lansing, J.S. and J.N. Kremer (1993). "Emergent properties of Balinese water temple networks: co-adaptation on a rugged fitness landscape" *American Anthropologist* Volume 95, Number 1, pp. 97-114
- Li, Honggu (2009), "Land of Opportunity", *Chona Daily*, 13 January, pp. 18.
- Mae-Wan Ho et. al.(2008). *Food Futures Now*, Beijing, Institute of Science in Society & Third World Network.
- Mahendra Dev, S (2003): *Right to Food in India*, Centre for economic and Social Studies, Hyderabad
- Mahendra Dev, S. et al. (2002). *Towards a Food Secure India: Issues and Policies*, Institute for Human Development, New Delhi and Centre for Economic and Social Studies, Hyderabad
- Manuliak, Kristy (1999): "Women and Children Last?" in *Bread for the World Institute: The Changing Politics of Hunger*, Maryland: Bread for the World Institute.
- Mazhar, Farahad, Daniel Bickles, P.V. Satheesh and Fairida Akhter (2007). *Food Sovereignty and Uncultivated Bio-Diversity in South Asia*, New Delhi, Academic Foundations and Ottawa, Cairo etc, International development Research Center.
- Meyer, Richard L. (2002) "Microfinance, Poverty Alleviation, and Improving Food Security: Implications for India" in Lal, Rattan (ed.) (2002) *Food Security and Environmental Quality*, Boca Raton, FL. CRC Press LLC.
- Meyers, D.W (1998): "Migrant remittances to Latin America: Reviewing the literature" Inter-American Dialogue/Tomas Rivera Institute Working Paper.
- Miyan, M Alimullah.(2008). *Cyclone Disaster Mitigation in Bangladesh* Dhaka, University of Dhaka, accessed on 30 November 2008 from <http://www.fao.org/forestry/media/11285/1/0/>
- Mukherjee, Amitabh and Mukherjee Neela (2008), *Use of common property resources for averting food insecurity in a Tribal Village in India*, India.
- Mukherjee, Amitava (1994). *Structural Adjustment Programme and Food security: Hunger and Poverty in India*, Avebury, Aldershot, Brookfield, Hong Kong, Singapore and Sydney

- Mukherjee, Amitava (2004). *Hunger Theory Perspectives and Reality: Assessment through Participatory Methods*, London, Kings College, University of London and Aldershot, Avebury.
- Murgai, Rinku, Paul Winters, Elisabeth Sadoulet, and Alain De Janvry (2002) "Localized and Incomplete Mutual Insurance", *Journal of Development Economic*, Volume 67, Number 2, pp. 245-274.
- Nanavaty, Reema, (undated). *Sustainable Livelihood and Agriculture, Observations and Experiences* , Ahmedabad, SEWA.
- Nino, C D et. al. (2001). *The 1998 Floods in Bangladesh – Disaster Impacts, Household Coping Mechanisms and Responses*, IFPRI, Washington D C
- Olimova, S. (2005). *Impact of External Migration on Development of Mountainous Regions*, Paper prepared for a workshop on Strategies for Development and Food Security in Mountainous Areas of Central Asia, held Dushanbe, Tajikistan, 6-10 June.
- Ostrom, E. (1992). *Crafting institutions for self-governing irrigation systems*. Institute for Contemporary Studies, San Francisco. 1992.
- Ostrom, E. (1994). *Neither market nor state: Governance of common-pool resources in the twenty-first century*. IFPRI lecture series. Washington D.C.: International Food Policy Research Institute.
- Platteau, Jean-Philippe (1991). Traditional Systems of Social Security and Hunger Insurance: Past Achievements and Modern Challenges in Ahmad, Etisham, Jean Dreze, John Hills and Amartya K. Sen (eds.) *Social Security in Developing Countries*. Clarendon: Oxford University Press
- Platteau, Jean-Philippe (1997) Mutual Insurance as an Elusive Concept in Traditional Rural Communities. *Journal of Development Studies* Vol. 33: 764-796
- Popkin, Samuel L. (1979). *The Rational Peasant: The Political Economy of Rural Society in Vietnam*. Berkeley: University of California Press.
- Praxis (1998). *Participatory Poverty Profiling Study, Bolangir District, Orissa*, Praxis, Patna
- Praxis (1999). *Consultations with the Poor, India 1999 – Site Reports from Andhra Pradesh*. Praxis, Patna
- Raihan, Selim (2008). "Impact of Food Price Rise on School Enrolment and Dropout in the Poor and Vulnerable Households in Selected Areas of Bangladesh", in *Bangladesh Economic Outlook*, Vol. 2 No.1 September, Dhaka, SHAMUNNAY.
- Reliefweb, 2008). "Urgent support needed for Pacific farmers and food consumers", September 22. <http://www.reliefweb.int/rw/rwb.nsf/db900SID/KKAA-7JR87> accessed on 16 December 2008
- SAARC (1992). Report of the Independent Commission on Poverty Alleviation, *Meeting The Challenge*, SAARC Secretariat.
- SAARC (2003) Report of the Independent Commission on Poverty Alleviation (2003), *Our Future Responsibility, Road Map Towards a Poverty Free South Asia*, SAARC Secretariat.
- Shahbaz, B (2006), "Analysis of institutional changes in forest management and their impact on rural livelihood strategies in NWFP Pakistan", PhD thesis, University of Agriculture, Faisalabad, Pakistan.
- Shahbaz, B (2007), "Analysis of institutional changes in forest management and their impact on rural livelihood strategies in NWFP Pakistan", PhD thesis, University of Agriculture, Faisalabad, Pakistan.
- Shaohua, Zhan (2005). *Rural Labour Migration in China: Challenges for Policies, Policy Paper ILO*, UNESCO, Paris
- Shapouri, Shahla and Rosen, Stacey (2001). *Food Security Assessment: Regional Overview, Agriculture Information/ Bulletin No.765-1*, United States Department of Agriculture- Economic Research Service, USA

- Sharma, Devinder (2004): "Farmers Suicide", 24 January <http://www.zmag.org/content/showarticle.cfm?ItemID=4871>.
- Shivakoti, Ganesh P. (2008) "Participatory Interventions In Farmer Managed Irrigation, Systems In Northern Thailand: Dynamism In Resource Mobilization", by, Asian Institute of Technology, Bangkok. PDF available from the net http://www.wca-infonet.org/servlet/binarydownloaderervlet?filename=1066126267718_shivakotig042400.pdf. Accessed on 26 December 2008.
- Sim Chi Yin (2008). "*The Village Where It All Began*", The Straits Times, Singapore, December 6.
- Smith, Justin (2009). "Self-Help Groups, Economic Capacity Building through Cooperative Associations" accessed from web on 13 January 2009. http://www.publicsphereproject.org/patterns/pattern.pl?public?pattern_id=624.
- State Bank of Pakistan (2006): *The State of Pakistan's Economy: Third Quarterly Report for the year 2005-2006*, State Bank of Pakistan, Karachi, Pakistan.
- Subbarao, Kalanidhi, Aniruddha Bonnerjee, Jeanine Braithwaite, Soniya Carvalho, Carol Graham, and Alan Thompson. 1997. *Safety Net Programs and Poverty Reduction: Lessons from Cross-country Experience*. Washington DC: World Bank.
- Sun Yinhong (2008). "Poor Chinese farmers sell and buy less in response to rising food prices" in IFAD *Making a Difference in Asia and the Pacific*, Issue 21, June-July.
- Sunil, W.A. (2005) "Suicides highlight desperate conditions facing Sri Lankan Farmers", WWSWS News and Analysis, 10 June 2005. <http://www.wsws.org/articles/2005/jun2005/sril-j10.shtml>.
- Swift, J (1993). 'Understanding and Preventing Famine and Famine Mortality', *IDS Bulletin 24.4*, Institute of Development Studies, Sussex.
- Tang, S.Y. 1992. *Institutions and Collective Action: Self-Governance in Irrigation*. San Francisco: Institute for Contemporary Studies Press.
- The MIX Market*, accessed from the web on 13 January 2008 from <http://www.mixmarket.org/en/demand/demand.show.profile.asp?ett=1658>.
- The Strait Times (2004). "Plight of Chinese Farmer", 5 September <http://www.hartford-hwp.com/archives/55/333/html>.
- UNCANEWS (2008) "ASIA South Asian Farmers Exchange Ideas On Organic Farming", 27 August 2008. <http://www.ucanews.com/2008/08/27/south-asian-farmers-exchange-ideas-on-organic-farming/>.
- UNWFP (2008). *Food Security Bulletin-20*, United Nations World Food Programme, Rome.
- USA TODAY (2005). "South Korean Farmers doggedly target trade talks", [com/money/world/2005-12-15-wto-fri-usat_x.htm](http://www.moneyworld.com/money/world/2005-12-15-wto-fri-usat_x.htm).
- Verma, L R, et al. (1998). *Indigenous technology knowledge for watershed management in upper north-west Himalayas of India*, Participatory Watershed Management Training in Asia (PWMTA) Program, Kathmandu, Nepal.
- Wilson, Kim (2002). "The New Microfinance An Essay on the Self-Help Group Movement in India", *Journal of Micro Finance*, Volume 4, Number 2.
- Xinhua (2008). "Kazakhstan gears up to tackle food crisis", July 12, on line edition.
- Zeller, M., G. Schrieder, J. Von Braun, and F. Heidhues. (1997). *Rural Finance for Food Security for the Poor: Implications for Research and Policy*. Washington, D.C., International Food Policy Research Institute.
- Zissis, Carin, (2007) "China's Internal Migrants", Council on Foreign Relations, New York and Washington, accessed from the web on 28 December 2008.