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Impacts of Natural Disasters in Agricultural Production and Marketing

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Abstract

In general, paddy cultivators or farmers reported that while natural disasters are a permanent risk to the economic viability of their farms, they were optimistic that their knowledge of the environment would enable them to adopt strategies that would minimize or mitigate the risks and enhance the likelihood of crop success in a dynamic environment with variable conditions. Though the farmers differed in their definition of what comprised a farming community, they were in agreement that the best strategy to overcome adversity was to rely upon the farming community, rather than governmental aid. The term natural disaster is most commonly defined as being a highly destructive environmental phenomenon (e.g., volcano eruptions, earthquakes, and tsunamis) that indiscriminately impacts a large geographic area, farmers expand this definition to include events that are more localized (e.g., microclimates) and have targeted impacts that are inclusive of those things that are crop specific (e.g., frosts and diseases). In the following sections, the article deals with how natural disasters affect quality of life, how farmers use networks of social and economic support and definitions of natural disasters are described.

Keywords: Natural Disasters, Agricultural, Marketing.

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Introduction

Agriculture is the foundation of the Indian economy and the basic means of livelihood for over 60 per cent of the population. GDP was no more than 17.1 per cent during 2008-09 and go down further to just around 16 per cent in 2009 -10. India is largely based on agricultural economy, with two-third of its population, make out their existence from farmland. However, challenges before agriculture has been increasing such as environmental changes and technological challenges increase in input price and variations in output price are the major problems today. Agriculture production is classified into three fold such as production of food-grain crops, commercial/cash crops and horticulture crops.

The term agricultural marketing is composed of two words agriculture and marketing. Agriculture, in the broadest sense, means activities aimed at the use of natural resources for human welfare, i.e., it includes all the primary activities of production, used to growing crops and livestock. Marketing connects a series of activities involved in moving the goods from the starting point of production to the end point of consumption. Marketing consist of all activities involved in the

creation of time, place, form and possession utility.

Definition of Natural Disasters

A working definition of natural disasters varies depending on what individual farmers have experienced in the past and what they view as future threats to their production. When asked, the informants were able to provide a list of natural disasters that have an immediate effect on agricultural production, many of which do not necessarily meet the criteria of the standard definition of natural disasters, as “any event or force of nature that has catastrophic consequences, such as avalanche, earthquake, flood, forest fire, hurricane, lightning, tornado, tsunami, and volcanic eruption” (Dictionary.com 2010).

Categories of Natural Disasters and effect on Agriculture

Of the two categories of natural disasters, environmental disasters were more commonly cited as being problematic for farmers. The most common types of environmental disasters are weather related events. Temperature related events such as freezes and frosts were implicated most frequently by farmers as causing the most intensive crop damage.

The Known enemies in Agriculture

Wind damage was mentioned approximately half as frequently, but was mostly limited to damage to trees, especially if the trees were in fruit. High winds

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could also cause structural damage, mostly to greenhouses, though not commonly cited as causing significant crop damage. Storms, however, with both high winds and hail can be devastating to fruit crops. Informants reported that sunburn of fruits and vegetables may also damage crops, but occurred less often than other weather related crop damage. Flooding can also have adverse effects on farm production. For example, one farmer lost an entire crop to flooding while two other farmers claimed flooding impeded their ability to bring produce to market. Natural disasters, in this case flooding, do not only impact production, but also distribution of produce. In cases when drought was mentioned, most farmers spoke about the current four-year drought that they fear will continue to impact their ability to grow crops, at least, in the near future. The farmers often mentioned earthquakes and fires, but farmers reported that these types of disasters had little effect on the farms, as earthquakes only cause minor damage to structures, not crops, and wild fires affecting farms are rare in this region of California.

According to farmers, while the frequency of biological disasters may be higher than environmental disasters, they seem to be less catastrophic. This may be due to the preventability or treatability of biological factors. Animal activity, such as small herbivores, gophers and squirrels, were cited as most common type of biological natural disaster that affects crops. Large herbivores, such as deer and wild boars, can cause widespread damage to ground crops and young trees, but are preventable with proper fencing. Carnivores are a problem for those farmers who also raise livestock, with mountain lions and bears being reported as responsible for livestock deaths. Insect pest activity, such as aphids and husk flies, may decrease production or damage produce so that it may not be sold. Informants reported that birds cause direct damage to grapes and berries through consumption or by spreading diseases. Birds and other biological pests may be prevented by various means (e.g., traps and netting) and do not pose a large threat to crops, but do raise the cost of production.

Intervention of biological disasters in Agriculture

Disease-causing agents are another subtype of a biological disaster. Viruses and fungi are more commonly cited as affecting fruit and nut trees than annual vegetable produce and, therefore, long-term and costly investment is needed to protect fruit and nut trees, which take many years to mature. Disease was cited to have the potential to destroy an entire orchard and is the main reason one informant refused to adopt solely organic practices even though she believed that organic farming was better for the environment and people that consume the produce. A few farmers who were interviewed indicated that artificial (e.g., economic and political) events amplify the affects of natural disasters. While not a category of natural disaster, amplifying events may have many of the same economic results.

Farmers often cited the current economy as the cause for lower sales. Bank loans and crop insurance become more difficult to obtain during a recession. Over-regulation may prevent the preferred treatment of a disease or infestation. Finally, water laws due to drought concerns may limit the amount of water that the farmer can give to his or her plants and lead to further crop issues. Today, agricultural produce has to undergo a series of transfers or exchanges from one hand to another before it finally reaches the consumer. There is a worldwide consent that Agricultural marketing and the nature of consumption, production and marketing of agricultural produce is critical. There is a need to go forward policies to address such issues. The proper implementation of disaster management is to be adopted in agriculture. To be the competitive advantage at the world scenario it is need of the hour to enhance and safeguard the agricultural sector.

The dimensions of problems affect Agriculture

- The quality of life of the farmers that were interviewed is affected in both preparing for and responding to perceived natural disasters. For example, extreme events can directly compromise health through disrupting water supply or access to medical facilities as well as generally increasing the likelihood of accidental injury.
- Loss of crops can mean loss of variety and nutrition in diet by the loss of foods consumed by the farmers and loss of income with which to purchase food.
- Prolonged financial difficulties cause long-term stress, which compromises biological immune systems and contribute to a large variety of other health concerns. Resources redirected to disaster response or preparedness (e.g., purchasing and installing greenhouses, removing flammable brush, installing new wells and irrigation) are unavailable for routine healthcare or health insurance.

How Disaster Management solves problems in Agriculture

It is believed that when farmers utilize sustainable farming techniques (e.g., biodynamics, permaculture, organic farming), they may protect against future natural disasters and improve the health of individuals working on the farm and consuming their produce. In addition, farms growing a variety of crops in hopes of preventing total crop loss in the event of a natural disaster can result in reduced outflows of chemical pollutants, having an ancillary benefit to the health of the surrounding environment in which the farmer lives. These sustainable practices are seen as a substitute or partial substitute for healthcare insurance by introducing a nutritious diet that benefits the farmer and the community by reducing the future cost of medical expenses. Changes in farmers' economic behavior brought about by the impacts of natural disasters are expressed by increased spending of preventative measures, short-term economic loss due to decline in

crop production, and impact of crop loss on the local economy. The increased spending on preventive measures (e.g., green houses, fertilizers, and irrigation) leads to short-term financial loss and, at the same time, an investment for future crop protection enabling long-term financial security. The severity of the event determines if the farmer experiences short-term and/or long-term economic loss due to crop reduction. Depending on the duration, the inability to meet consumer demand can be a short-term financial loss that can lead to a long-term economic hardship. The consumer may opt to seek other suppliers if the farmer is unable to supply a product in a timely and consistent manner, thus affecting the farmer and the local economy. The businesses with which farmers rely on (e.g., farm stores and labor contractors) also have a stake in the farming community and any altered state of economic behavior on a farm has an effect on the local economy. Farmers may go years without experiencing a governmentally recognized natural disaster while continuously coping with challenging weather events that some consider normal, and others consider natural disasters. Farmers' experience equips them with the knowledge to manage these individually catastrophic events and minimize potential damage. Occasionally an unusually extreme and unforeseen natural disaster causes unanticipated damage and economic loss. These natural disasters reveal previously unknown vulnerabilities. Unexpected losses motivate individual farmers to modify their farming practices. Seeking appropriate responses, these farmers engage in new learning behaviors. These behaviors include devising experimental tests and agricultural techniques, researching appropriate practices on the Internet, consulting the farming community, and occasionally seek advice from government agricultural agencies. These efforts may also result in relief provided by the community in the form of donated labor. If such relief is needed and available, it usually arrives quickly due to the connectedness of local farm communities.

Role of Farmers in Disaster Management

- Farmers stated that they attempted to prevent or lessen the effects of natural disasters by their choice of location, diversity of crops, and timing of harvests.
- Farmers reported that it was important to understand the characteristics of the land both for choosing the location of fields, but also for the best time to plant and harvest particular varieties of crops. There appears to be agreement among farmers that by understanding the land and plants one can reduce the impact natural disasters have on crops.
- One method that was reported to work for small-scale farmers was diversifying their crops to ensure that a minor natural disaster (e.g., isolated frost) would only affect part of the farm's total crop yield. One farmer explained that "real farmers [that are] really connected to nature are self-insured [because]

you can't be connected to nature and have a monoculture."

- In another attempt to create support mechanisms against farm losses due to natural disasters, farmers utilized farmers' markets and Community Supported Agriculture (CSA) cooperatives to find customers to purchase their produce as well as making lasting connections with the community at large.
- Merchants and farmers interviewed at each of the farmers' markets expressed how they were pleased with the opportunities that the farmers' markets gave them to sell their produce on a weekly basis and create lasting relationships with their customers, who are often referred to as regulars. Many of the customers were willing to support local farmers by paying slightly more for the local produce at the markets or CSAs versus buying similar produce at the grocery store.
- Many small-scale farmers expressed that farmers' markets and CSAs are the only real alternative to selling their produce wholesale. Community members who take part in a CSA often wish to support locally grown produce more than those who shop at the farmers' markets.
- There is a variety of ways farmers rely on other community members as well as other farmers, most often, physically, financially, and/or intellectually. Many of the farmers that were interviewed reported that they asked other farmers in their community to help with physical labor on the farm due to unforeseen circumstances such as a sudden frost during which crops needed to be covered quickly.
- Farmers also stated that they received financial assistance from other farmers and community members through fundraisers.
- Finally, farmers described how they shared ideas with each other to enhance each other's farming techniques. This was most common with farmers that were devoting all or part of their crop to organic produce.
- Similar to how farmers in the area relied on the community, they also relied on family and friends financially, physically, and intellectually, as well as emotionally.
- Many farmers said that they asked for physical labor help and borrowed money from their family and friends in time of need. Friends and family were a valuable resource to many of the farmers, whether they needed help starting a new farm or on a well-established farm with the daily work.
- Family and friends were also described as an outlet for the emotional struggles that occur during farming in general as well as preparing for or recovering from natural disasters.

Conclusion

The serious problems experienced by the Indian agriculture is Loss of irrigation and water resources in rivers, streams, and ground water contributes to dramatic shifts in aquatic ecosystems. Agricultural pesticides can contaminate streams, ground water, and wells. Excessive use of certain pesticides could be harmful to agricultural workers and might pose food safety risks. This is the right time to address all the issues before us and should not reluctant to new approach. The study report findings show positive and promising outcomes among the production systems, farming businesses, and communities that are pursuing improved sustainability. It also reveals the importance of government agencies, farmers, food industry companies, communities, and consumers to support research, policies, programs, and institutions that help Indian agriculture move along the sustainability line.

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