

## Need for the Second Green Revolution

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### **ABSTRACT**

The paper begins with describing the importance of green revolution in India since 1960's. It provides brief background to the structural changes that took place for the Green Revolution to be successful. The study is based on the secondary sourced from various issues of Economic Survey, related books and journals for the time period 1960 to onwards. The paper studies that there is a successful rise in food grain production, agricultural growth rates in the ninth and tenth five year plans have not been up to expectations. At that time, economy started facing stagnation in agricultural production. When we compared India to its neighbouring countries, India's performance in the agricultural sector has been far from satisfactory. After some years of green revolution the production level reached at saturation point. After that there is a need for a second Green Revolution to increase the agricultural sector share in the GDP. There are certain critical elements that are required for the Green Revolution to take place, both in terms of technology usage and issues to be considered. The second should focus on generating employment and reduction of poverty.

**KEYWORDS:-** Green Revolution, Second green revolution, multiple cropping system.

### **INTRODUCTION**

In 1960's, India was successful in creating a Green Revolution which gave a rise to the agricultural production across the country. Now-a-days we have already started experiencing stagnation in agricultural production. Therefore we need

to create a similar revolution in the near future. While the first Green Revolution aimed was to ensure food security as there was food scarcity in the country, the second Revolution should aimed at creating sustainable livelihood security for the poor and eradication of poverty by generating gainful employment. A

mexican scientist , Prof. Norman Borlaug (Father of Green Revolution) and their team were developed new High Yielding Varieties (HYVs) of wheat. Lerma , Rofo , Sonara-64 , Kalyan and P.V.18 were the mexican varieties. At that time , a situation arise where the demand for seeds by the farmers is more than their supply .The result of green revolution were revolutionary .There was an increase in the -production and productivity of food grains . HYVs was restricted to 5 crops only-

- (a) Wheat,
- (b) Bajra,
- (c) Jowar,
- (d) Rice,
- (e) Maize.

In previous time, the farmers were able to grow only one crop in a year , but after the introduction of HYVs they are able to grow two or more crops in a year. Green Revolution helps in solving the problem of seasonal unemployment because there is possibility of growing more than two crops . In India , the green revolution is also called wheat revolution because the best results were shown by wheat . The country was changed into a food surplus country from a food shortage country .

## **OBJECTIVES**

- To study the impact of first green revolution in India since 1960 to till now.
- To highlight the issues related to the need of second green revolution.
- To study the government initiative for introducing second green revolution.

## **RESEARCH METHODOLOGY**

The study is based on the secondary data which is collected from various issues of economic survey, various books, newspaper, magazines , journals etc. The time period is considered from 1960 to till now. Many required statistical tools are used to find out the results i.e. compound growth rate etc.

## **REVIEW OF LITERATURE**

Dey Dipankar ,(2009) studied the second green revolution in India : the emerging contradictions , consequences & the need for an alternative initiative. He pointed out that there is an adverse impact of climate change on availability of water & an agro bio technology based second green revolution was initiated . he concluded that

to save this earth from clutches of few mega corporations , a mass movement led by the concerned scientists has to be organised across the globe.

Mukherji Aditi , Tushar Shah & Partha Sarathi Banerjee (2010) studied that late last year the government of west bengal took two policy decision , one to facilitate easier extraction of ground water and other , the application fixed connection fee for an electricity connection to farmers could well lead to a quantum leap in agricultural production.

Kathryn Sebby (2010), studied that in 1960s the green revolution was initiated to introduce the issue of malnutrition & food shortage in the developing world . The technology of green revolution was adopted in many states in India & for some was great success . However , there were many farmers who cannot afford them & due to this the wealthy farmers got wealthier and poor become more poorer.

### **First Green Revolution**

Green Revolution introduced by “Norman Borlaug ”in Mexico. Mankombu Sambasivan Swaminathan is an Indian international administrator who took the leading role in India’s Green Revolution .His main aim was to eliminate world starvation and poverty by using

environmentally sustainable agriculture. In 1968 , the term “Green Revolution” first used by former USAID director William Gaud.

At that time ,India is facing scarcity of food .To meet this situation government of India has introduced Green Revolution in the later half of the second five year plan to increase agricultural production and productivity .It is a process by which farmers producing more food and agricultural products from less land. It also involved development of HYV seeds of cereal grains ,irrigation facilities ,modernisation of techniques,synthetic fertilizers and pesticides to farmers.

### **CAUSES**

**Irrigation** : Improved facilities of irrigation are responsible for green revolution . In India , there is increment in tubewell irrigation .“In 1965-66 , 22 lakh hectares area had irrigation facilities while 76 lakh hectares in year 2002-03 .”

**Machinery in agriculture** : The agriculture pattern was mechanised at that time . Tractors , threshers , harvesting ,combines etc are used in many parts of the country . Punjab has largest number of tractors .In 1966 , there were 10 thousand

tractors , while in 2002-03 , it increased to 3.54 lakhs .

**High Yielding Varieties seeds** : Use of HYV seeds have played most significant role in agricultural production. It also helps to increase producton. Per hectare yield of wheat has increased from 1200-4500 kgm . In case of rice the yield increased from 1000 to 3500 kgms .

**Fertilizers** : At the time of green revolution , the production of food grains also increased by the use of fertilizers .In 1965-66 chemical fertilizers were used to 97 thousand tonnes , while in 2002-03 their use increased to 1441 thousand tonnes.

**Plant Protection** : In previous times , there was no protection of plants against disease . so crops were damaged largely . But now there proper way to protect plants from diseases and pests . Expert advice the farmers against diseases and plant clinics are also opened . Pesticides are sprayed time to time to protect the plants .

**Marketing Facilities** : In early times , there were inadequate marketing facilities . Farmers sell their produce at low prices in unregulated markets . Now , in warehouses and cold storages farmers can store their produce and get necessary price of their produce .

**Multiple Cropping** : Farmers enable to grow more than one crop in a year by using HYV seeds and irrigation facilities .

**Credit Facilities** : In previous time , money lenders provide credit to farmers at a high rate of interest . Loan facilities to farmers provide by Agricultural Development Banks and Co-operative Credit facilities . Now , farmers are able to buy more machines , pesticides , fertilizers , HYV seeds with the help of cheap credit facilities.

**Reclamation of Land** : In India , the Land Development & Reclamation Corporation was established to make the land cultivable . The government has done many efforts to make uncultivable land cultivable .

## IMPACTS

### Positive Impacts

Increment in agricultural production: Green Revolution helped in increasing production of crops. In Third Plan the wheat production increased from 11.1 million tonnes , In eighth plan it was 66.4 million tonnes .In 2001-02 the production increases to 72.8 million tonnes . But in 2005-06 it falls to 69.4 million tonnes. In starting the rice production increases slowly but later it increases fastly . The

production was 35.1 million tonnes in the third plan ,it increases to 93.3 million tonnes in 2001-02 . It falls to 88.05 million tonnes in 2003 -04 . In 2005-06 , it increases to 91.8 million tonnes and there was minor change in the production in 2006-07. In 2002-03 , the production of jowar , bajra , maize falls to 26.2 million tonnes . In 2005-06 , it increased to 34.1 million tonnes. (Source : Economic Survey) .Better land use by employing two and three crop pattern:In previous time, the farmers were able to grow only one crop in a year , but after the introduction of HYVs they are able to grow two or more crops in a year. Better scientific methods (techniques) applied as per requirement of farms: In early days , the Indian farmers were illetrate , backward , traditional and using traditional methods of cultivation . But after green revolution there is a basic change in his attitude towards farming . They adopt better scientific methods and new techniques which applied as per the requirement of the farm. New seeds have been developed with disease fighting capability. Decrease in import of food grains: Green Revolution leads to increase the production of food grains, as a result there was massive reduction in their import. After Green revolution, we have gain self sufficiency in production of food grains. “The per capita net availability of

food grains has also increased from 395 gms per day in early 1950s to the level of 436 gms . In 2003, this in spite of rapid increase in population. Industrial growth: After introduction of green revolution, there was increase in the demand for various types of machines (farm techniques) like tractors, harvesters, threshers, combines, diesel engines, electric motors, pumping sets etc. Other side it also leads to increase the demand for chemical, fertilizers, pesticides etc. Many agricultural products are used as raw material in various industries which are known “agro-based industries” like textile, sugar, vanaspati etc. Benefits to farmers: It helps in improving their economic situation both small and marginal farmers getting better yield, control on many insects and pests, improved working conditions.

### **Negative Impacts**

**Land degradation:** Due to employing two and three crop rotation every year land quality has declined and due to heavy chemical fertilizer inputs land has become hard.

**Increment in weeds:** Due to heavy crop rotation pattern we do not have time to

employ proper weed removal system which has increased weeds.

**Availability of chemical in water:** These chemicals which we have been using in our farms go down and contaminate ground water which affect health.

**Loss of bio-diversity:** Due to heavy use of pesticides, insecticides and fertilizers we have lost many important genes which are available in our bio-diversity.

**Old seeds have been lost:** The farmers use new seeds and lost old once .New seeds give better yield but due to this farmer have lost many important genes in these seeds.

### **Compound growth rate of production of some crops since 1949 -50 to 2013-14 (India)**

(Base T.E 1981-82=100)

Crops	Pre-GR 1949-50 to 1964- 65	GR Period 1967-68 to 1980- 81	GR 2001-02 to 2013- 14
Rice	3.5	2.2	1.6
Wheat	4.0	5.7	2.3
Jawar	2.5	2.0	-2.3
Bajra	2.3	-0.4	2.2
Maize	3.9	0.0	5.2

Source: Various issues of Economic Survey

### **ACHIVEMENTS OR FAILURES**

India's agriculture sector is growing but much slower than the rest of the economy. Although largely self-sufficient in food production . India still need to import edible oil every year. Green Revolution has not reach large parts of the country especially dry land areas, where poverty incidence & farming risk tend to be high.Green revolution also involved environmental costs: unsustainable ground water extraction ,fertilizers run off ,pesticide residues and salinization.

### **SECOND GREEN REVOLUTION**

An integrated approach based on the entire farming system focusing on matching soil to seed and product to market. After forty years of Green Revolution, Indian agriculture is once again at the crossroads. The growth in agriculture has declined. Forests are destroyed or soil fertility is declined, the rural poor have migrated to towns and cities in search of jobs. Therefore we need to create a second green revolution. The second green revolution should focus on employment generation for small, marginal farmers and landless. As they mostly owned degraded and low fertile lands, lack of irrigation, the

focus should be on better use of such lands.

### **Still Problems in India**

- There is no availability of fertile land.
- Agricultural inputs are expensive.
- Rural people are displaced from their land.
- Excess use of fertilizers and pesticides are bad for health and environment: Farmers and workers suffered from health problems due to high use of fertilizers, pesticides, insecticides. Fertilizers and pesticides cause environmental pollution which can reduce by better management of these inputs without sacrificing yields.
- Agricultural jobs are reduced by mechanization: Due to mechanization of agriculture, Green Revolution leads to increase in unemployment of unskilled workers. After that very few workers were needed in farm operations.

### **NEED FOR SECOND GREEN REVOLUTION**

According to Dr. APJ Abdul Kalam if all Indians have to have good nutrition and plenty of food then India needs 360 million tonnes of food grains by 2020. India has tremendous export potential in agriculture in present era of globalization.

With the rising population the growth of agricultural sector has been declined therefore there is need to plan for the second green revolution.

Target of the year: 2020—400 million tones

Is it achieved???

Yes it is achieved, there is need to change technology, policies, and approach.

### **Requirements of Second Green Revolution**

- Increment of food-grain output in India to 400 million tons in next 15 years is need of the day.
- It is achievable if mindset on introducing newer technology is changed.
- Introduce genetically modified (GM) seeds to double the per acre production.
- Private sector is better suited to deliver results than government managed schemes. Pvt. Sector to

develop and market the usage of GM foods i.e. efficient marketing of ideas.

- Governments expand more on irrigation schemes and managing water resources.
- Linking of rivers from one area to another to bring surplus water.

### **PM Calls For Second Green Revolution**

PM Narendra Modi asked farmers to adopt scientific methods to increase food production and reduce imports by using one-fifth of their farming land to cultivate pulses .He said that Indian farmers are still lagged behind in terms of availability of good quality seeds, adequate water, power, right price and market for their produce.

Invoking former PM Lal Bhahdur Shastri slogan “Jai Jawan, Jai kisan.Modi asked farmers to try and grow pulses on part of their land.

The production of pulses is very low in our country. I urge farmers that if they have 5acres of farming land, use 4 acres for other crops but cultivate pulses on at least 1 acre. The centre is willing to pay more than the announced minimum support price to farmers for pulse production.

The government is making many effort to make the farmers aware of modern scientific methods.We want private

individuals to own laboratories ,to test soil and issue a health card so that a farmer is aware of the deficiency ,fertilizer requirements and type of crop suitable for his plot of land and this will also lead to job creation.

### **Important issues that India needs during the Second Green Revolution**

- ✓ To encourage the adoption of new technologies that use resources more efficiently without any wastage.
- ✓ Change the mindset of farmers which help them to realize that their scope of work can increase.
- ✓ Encourage farmers to produce crops where they have natural advantage.

### **Required Technologies for the Second Green Revolution to be Successful**

**Soil matching:** It is a process of find out soil deficiencies and excesses. If there are excessive salts, these have to be neutralized with chemical or biological treatment. Deficiency of zinc or phosphorous can be rectified by adding supplements.

**Water Technologies:** The amount of water used should be minimised by using various technologies.

**Crop Rotation and Better Seeds:** Crop rotations increase yield by improving soil conditions and reducing weed and insect populations.

**Animal Husbandry:** A large number of farmers in India depend on animal husbandry for their livelihood. Supplying milk, meat, eggs, wool, and care of animals by humans for profit. It should be need to adopt nationally.

**Fertilizers and Pesticides:** These are necessary for improving crop output, they can be reduced to a minimum if soil tests are conducted properly and irrigation is controlled. Farmers should use organic fertilizers because chemical fertilizers are expensive and polluting.

## MULTIPLE CROPPING SYSTEM

It is not a form of agricultural technology, but instead is an ancient mean of intensive farming. Multiple cropping has been practiced in many parts of the world of maximise land productivity in a specific area in a growing season. The practice of planting two or more crops on the same field is more common in regions where more rainfall, higher temperature and

longer growing seasons are more favourable for continual crop production. As population has increased, increasing the need for agricultural production, the use of multi-cropping system is more prevalent.

## SUGGESTIONS

- Make efficient use of available resources without any wastage.
- Government should make many efforts to make the farmers aware of new technologies.
- Government should manage water resources and expand on irrigation schemes.
- Farmers should use new water and other technologies.
- Always right value of money will charged for agricultural products.
- The centre has to pay minimum support price to the farmers for their production.

## CONCLUSION

Indian agricultural production was boosted at the time of first green revolution. But

now a days, productivity per hectare and per farmer was extremely low, because farmers use traditional techniques. The second green revolution aim to increase food grain production in India to 400 million tonnes in the next 15 years. It is not difficult to achieve but there is need to change the mindset of farmers for new technology has been changed. India has to accept new technology. Due to fast growing population there is a need to increase the production and per capita yield.

## References:

Beddington, J. (2010). Food security: contributions from science to a new and greener revolution. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1537), 61-71.

Dey, D. (2009). The 2nd Green Revolution in India: The Emerging Contradictions, Consequences and the Need for an Alternative Initiative. *Consequences and the Need for an Alternative Initiative (August 12, 2009)*.

Fujita, K. (2010). The green revolution and its significance for economic development.

Mukherji, A., Shah, T., & Banerjee, P. S. (2012). Kick-starting a second green revolution in Bengal [India].

Pingali, P. L. (2012). Green Revolution: Impacts, limits, and the path ahead. *Proceedings of the National Academy of Sciences*, 109(31), 12302-12308.

Pinstrup-Andersen, P., & Hazell, P. B. (1985). The impact of the Green Revolution and prospects for the future. *Food Reviews International*, 1(1), 1-25.

Rosset, P., Collins, J., & Lappe, F. M. (2000). Lessons from the Green Revolution. *THIRD WORLD RESURGENCE*, 11-14.

Sebby, K. (2010). The Green Revolution of the 1960's and Its Impact on Small Farmers in India.

TUTEJA, U. (2006). Indian Agriculture: In Search of Second Green Revolution. *Economic Survey*, 20064(7), 9-2.

## Related Websites:

[www.yourarticlelibrary.com](http://www.yourarticlelibrary.com)

[www.study.com/](http://www.study.com/) what is the green revolution

[www.geography.about.com](http://www.geography.about.com)  
[www.economicdiscussion.net](http://www.economicdiscussion.net)

<http://en.m.wikipedia.org>.

<http://livingheritage.org>

[www.timesofindia.com](http://www.timesofindia.com)