Sustainable Development through the Natural Resources Management - A case study of Chhattisgarh's Innovation in Agriculture through NGGB Scheme

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Abstract

Nature is the source of life and a country's natural resources are its fertile lands or the minerals that are found there, not the crops that are grown there. A "natural" resource is one that is offered by nature without the assistance of humans. Natural resource management refers to the strategies used by societies to control the availability of or access to the resources they need to survive and thrive. Since natural resources are the foundation of human existence, maintaining on-going access to or a steady supply of natural resources has always been essential to the structure of civilizations (Charlotte, 2023). Using indigenous knowledge and technology, Chhattisgarh has developed a strategy for rural transformation that includes water conservation, livestock management, promoting the use of organic manure, and backyard nutrition. It is characterized as the NGGB (Narwa, Garuwa, Ghuruwa, Badi). Its goals are to maximize the use of already-existing resources in order to encourage resource-efficient growth in villages. This article is aimed at understanding the management of natural resources for the sustainable development. The study's findings will be highly beneficial in determining how locals see rural areas and how they feel about the management of natural resources in Chhattisgarh. The global concern is the efficient operational and conceptual management of the planet's natural resources. Since "sustainable development" has replaced the previous definition of development and conservation, this article has concentrated on innovative concepts for sustainable development.

Index Terms: **NGGB, Narwa, Garuwa, Ghuruwa, Badi, Self Help Groups.**

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1. INTRODUCTION

The concept of sustainability, which refers to development that takes into account the environmental aspects of its operations, was deliberated upon at the 1972 Stockholm Conference, which promoted the idea that environmental factors must be taken into account when implementing development. The Stockholm Conference addresses environmental challenges and how eco-development might be incorporated into development solutions. The conference's execution aligned with the UN's goal of mitigating and repairing environmental harm that has occurred. The 26-point declaration brought environmental issues at the forefront in international affairs and initiated a conversation between developed and developing nations about the relationship between economic expansion, pollution of the air, water, and oceans, and global human well-being (United_Nations, 1972). The main views on sustainable development and the exploitation of natural resources are economic and ecological. In particular, information on resource stocks and quantities used, resource flows involved in domestic products, the effectiveness of natural resource use and its substitutability, waste and the impact of recycling are needed to describe the natural resource base for sustainable development and the economic and ecological dimensions of natural resource use (Jukka_Muukkonen, 1990).

In Indian agriculture, there are always more problems than answers. In addition to the constant risk component, farming became unprofitable due to rising costs of cultivation and debt in both formal and informal loan markets, particularly for small and marginal farmers. While the yields of income crops such as oilseeds, sugar cane, and cotton are gradually declining, the use of certified seeds declined drastically by 3.15 Percent after 2011. The most essential and fundamental component of sustainable agriculture is seed. The quality of the seeds greatly influences how all other inputs respond. Depending on the crop, the direct contribution of high-quality seed alone to overall production is estimated to be between 15% and 20%, but with effective management of other inputs, this can increase to 45% (Minisstry_of_Agricultre_&_Farmers_Welfare_Govt_of_India, 2023). The policy gave access to Indian farmers of the best of seed and planting material available anywhere on the world. But, farmers are still caught in the vicious cycle of poverty, which includes poor income, low investment, low production, and low productivity again.

The state of Chhattisgarh has a total geographical area of about 138 lakh hectares, of which 46.51 lakh ha, or 34%, are net sown area. Approximately 2.55 crore people live in the state overall, with 70% of them working in agriculture. The state is home to roughly 37.46 lakh farming families, of which about 80% are classified as small and marginal farmers. The main crops grown in Kharif season are paddy, soybeans, urad dal, and arhar; in Rabi season, chickpea and lathyrus are the key leaders. The state also grows maize, millets, moong, wheat, groundnuts, and other crops. The Chhattisgarh central plains are referred to as the "Rice Bowl of Central India." The government is focusing especially on improving the way its water resources are managed. The goal of the state government's irrigation potential expansion is to lessen farmers' reliance on rainfall. Currently, the state's net irrigated area is approximately 14.76 lakh hectares, or roughly 32% of the net seeded area (Directorate_Agriculture_Chhattisgarh, 2023).

2. LITERATURE REVIEW

2.1 Sustainable Development

"Sustainable development requires an integrated approach that takes into consideration environmental concerns along with economic development (UN, 2023)." "It is described as development intended to satisfy current needs without jeopardizing the capacity of future generations to satisfy their own needs (Brutland_Commission, 1987)." The two main ideas in the definition are the importance of providing the poor with basic necessities and the environment's finite ability to support the needs of both the present and the future generations.

The three primary development pillars of sustainable development are social, economic, and environmental. When environmental considerations are incorporated into economic decision-making, particularly when evaluating environmental assets and the effects of development on the environment, the three pillars are connected to one another. The ability to meet current needs without sacrificing the availability of resources for future generations is known as environmental sustainability. This is achieved through the adoption of appropriate practices and policies that gradually preserve and protect the natural environment. Social development must strike a balance between the two pillars. Prioritizing the welfare of individuals and communities is a key component of social sustainability. It is about advocating for fairness, human rights, decent work, and access to healthcare and education. The goal of social sustainability is to maintain social cohesion and justice while fostering inclusive societies, lowering inequality, and ensuring everyone's long-term well-being. The economy depends on social and environmental factors, just as human and social existence depends on the environment. The goal of economic sustainability is to conduct economic activity in a way that maintains and advances long-term economic well-being. Its practical goal is to strike a balance between financial stability, social equity, resource efficiency, and economic growth. However, the three pillars are not mutually exclusive; rather, they are complex (ENEL, 2023).

2.2 Natural Resource Management

According to the Environment in Humanitarian Action Initiative (EHA) a natural resource is considered non-renewable when it exists in a fixed amount, or when it cannot be regenerated on a scale comparative to its consumption (EHA_Connect, 2023). To lessen the likelihood of disasters and the susceptibility of communities to their effects, land and land use, including agriculture, forestry, water systems, life forms, and the atmospheric environment, must be managed effectively. Some natural resources, like water, sea, air, and forests, have to be regarded as part of our collective legacy. An attempt is made to prevent environmental damage through the permit arrangement process in natural resource management. Management of natural resources must make reference to the idea of sustainable development. Sustainable development is a process that takes into account the needs of the present and the future when it comes to resource use, investment, technology development direction, and institutional change. It is not a static state of equality. Realizing sustainable development requires striking the correct balance between culture, the environment, and the socioeconomic system (Ilyas, Arisaputra, Utami, Bakar, & Arifin).

2.3 Agriculture Overview, Characteristics, Cropping Pattern & Status of Chhattisgarh

On November 1, 2000, the 26th state of the Indian Union was created: Chhattisgarh. With an average annual rainfall of about 1207 mm, Chhattisgarh is located between 17°46' and 24°5' North Latitude and between 80°15' and 84°20' East Longitude. The Chhattisgarh central plains are referred to as the "Rice Bowl of Central India." The state's net sown area is 46.51 lakh ha, or 34% of its overall geographical area, out of a total area of about 138 lakh hectares. Medium to light soil makes up about 57% of the area. With 63.4 lakh hectares of forest cover, or 46% of its total geographical area, Chhattisgarh has one of the richest bio diverse areas in the nation. Approximately 2.55 crore people live in the state overall, with 70% of them working in agriculture. The main crops grown in Kharif season are Paddy, Soybeans, Urad Dal, and Arhar; in Rabi season, Chickpea and Lathyrus are the key leaders. Considering that the state is home to four well-functioning cooperative Sugar plants, there is considerable potential for sugarcane cultivation in certain districts. The state also grows Maize, Millets, Moong, Wheat, Groundnuts and other crops. (Department_of_Agriculture, 2022).

Approximately 80% of the people living in the state of Chhattisgarh rely on agriculture and the forest for their livelihood. Chhattisgarh's agriculture is distinguished by low investment levels, a significant reliance on precipitation, a large number of small to marginal farmers, low productivity, and mono-cropping. Based on official statistics, the state has 37.56 lakh farmer families, of which 76% are classified as small and marginal. While the majority of the irrigated area 66 % is fed by canal irrigation, about 36% of the area is irrigated from other sources. Because 55% of the state's arable land has a low water-holding capacity, growing a second crop without irrigation is not practical. The state administration has attempted to extend the area under double cropping by launching a number of programs to boost irrigation facilities. With the exception of oilseeds, the state produces more food grains overall than is necessary even though the productivity of those grains is lower than the national average. The foundation of the Chhattisgarh Holistic Indigenous Rural Advancement and Agriculture Growth Project (CHIRAAG), a rural transformation initiative, is the development and best use of indigenous village production resources through: a) Bio-composting (Ghuruwa); b) Livestock management and increased productivity (Garuwa); c) Rivulet regeneration and conservation (Narwa); d) Supporting nutritional and revenue-generating activities through backyard fruits and vegetables (Badi); to move from subsistence to semi-subsistence farming and ultimately to commercial output at the village level (IGKV, 2020).

2.4 SWOT analysis of Chhattisgarh with reference to agriculture

State as a whole has its strength weakness, opportunity and threats in the field of agriculture and allied sector, which provides guideline for sound planning and its implementation to fulfill the growing need of growing population. The important features of SWOT analysis are given below (NABARD, 2023).

Table 1: The SWOT analysis of Chhattisgarh w.r.t. agriculture

STRENGTHS	WEAKNESS
• Higher average rainfall (Average annual 1199 mm)	• Dominance of Small and marginal economically weaker families.
• Varied soil types suitable for various crops	• Fragmented land holding.
• Adequate electricity	• Erratic rainfall.
• Rich in biodiversity	• Less irrigation facilities (36%).
• Chhattisgarh Holistic Indigenous Project	• Light soils having low fertility and water holding capacity.

OPPORTUNITIES	THREATS
• Wide range of crops can be grown.	• Erosion of biodiversity.
• Vast scope for crop diversification.	• Drought and erratic rainfall.
• Area expansion under assured irrigation.	• Diversion of Agriculture land to non-agricultural purposes.
• Enough rain water to harvest and utilise	• Depleting ground water.
• Scope to improve SRR (Seed Replacement Rate).	• Crop menace by stray cattle for double cropping.
• In general, yield of the crops is low. Enough opportunity to yield improvement in all the crops.	• Poor market accessibility to many crop produces as post-harvest processing industries is lacking.

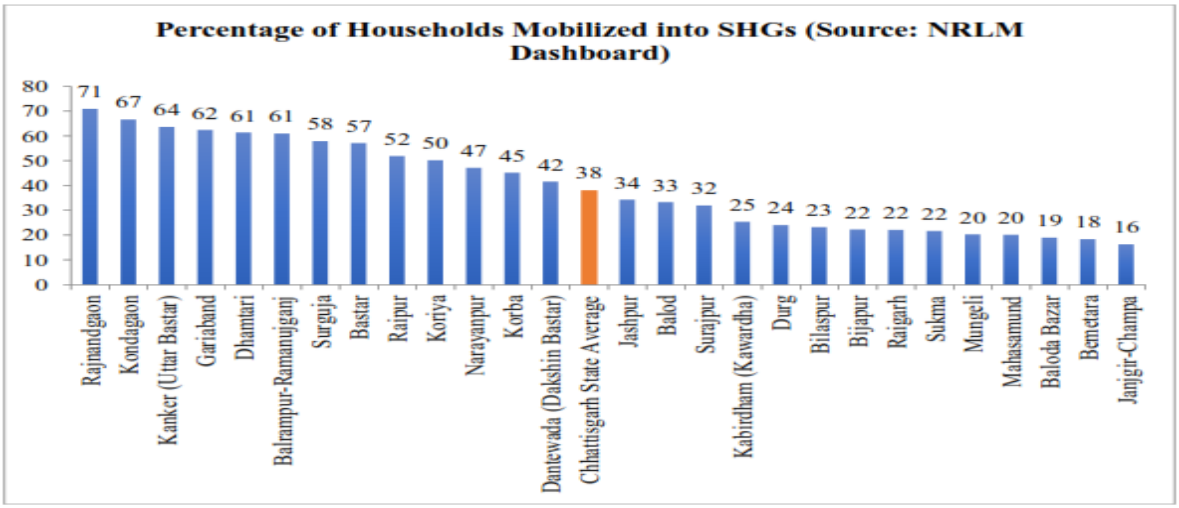
(Source: NABARD, Report Sustainable Agriculture Practices in the Chhattisgarh State, 2023)

2.5 Suraji Gaon Yojna

The State Government's flagship scheme - "Suraji Gaon Yojana" is a program that supports backyard farming, organic composting, livestock management, and rural sustainable living. It is divided into four pillars: Narwa (water conservation), Garwa (livestock management), and Badi (backyard farming) (CG_State_Planning_Commssion, 2022). The goal of the "Suraji Gaon Yojana" is to use traditional resources found in rural areas to bring villages into the centre of the state's economy. Due to the scheme's ability to raise rural residents' and farmers' incomes, the rural economy has seen substantial growth. In Chhattisgarh, traditional natural resource management plays a significant role in protecting biodiversity. These practices are sustainable because they focus on restoring the natural world, minimizing excessive generation waste of resources, managing resources according to subsistence needs, and creating conditions that encourage natural regeneration. Along with the agriculture and related departments of the Chhattisgarh government, horticulture, animal husbandry, and fisheries are also working to realize this idea of Integrated Rural Development Program (CGCM, 2020).

2.6 Self Help Group (SHG)

The Chhattisgarh State Minor Forest Produce (Trading & Development) Co-operative Federation Ltd states that Muhammad Younus is the founder of the women's self-help group movement, and that the idea originated in Bangladesh. The primary goals of the self-volunteer Women's Self Help Group are to encourage self-employment and raise funds for the purpose of lending members' loans at favorable terms. Group is an unofficial group that operates on the principles of assistance and mutual trust. It is not necessary for Self Help Groups to register under any laws. Ten to twenty people with similar social and economic statuses make up the group. Decisions in a group setting should be decided upon equally and by consensus. As much as feasible, groups should be composed of people in similar economic situations; that is, groups of people who are above the poverty line should be constructed differently from groups of people who are below it. The following methods can be used to choose the members of a self-help group: Members who are only female, exclusively male or a combination of both (MFPCFL, 2024). To estimate the work and activities of the Self Help Group, the group should meet regularly at least once a month. Grading should also occur at least once a month. Although grading can be done by any department or agency as needed, Panchayat & Rural Development and Women's & Child Development departments typically handle grading.



3. OBJECTIVE OF THE STUDY

- To find out how Chhattisgarh's NGGB, being a unique indigenous program, is handling the natural resource management issues for the sustainability.

4. METHODOLOGY

This study falls into the category of fundamental research. The goal of this research is to advance theories, knowledge, and forecasts. Primary and secondary sources have been used to gather research data. Examining the NGGB Scheme critically in the context of the present is the primary goal of the paper. The study's foundation is secondary data that was gathered from numerous sources, and it is descriptive in nature. It pulls from reports, blogs, reference websites, and research papers, pieces from newspapers and periodicals, and works of existing literature. It is basically based on the data disclosed by the various government departments like, forest, agriculture, water resource, MNREGA, Planning Commission & Agriculture Development and Farmer Welfare and Bio-Technology department. This study aims to provide a better understanding of the current state of affairs by mapping the changes that have occurred over time. In this case, data is gathered through longitudinal research, which is a study that has been conducted to compile data over an extended period of time. Making choices from all of these many study kinds is a step in the process of developing this research design.

5. INNOVATION IN AGRICULTURE THROUGH NGGB- "NARWA, GARUWA, GHURUWA, BADI"

NGGB is a flagship program of the Chhattisgarh Government since 2019. "Chhattisgarh's vision for reviving agriculture is collective action to ensure water conservation, livestock development, compost usage, and cultivation of vegetable and fruit" (Rao, 2019). The NGGB mapping system identifies the natural resources that underpin ecosystem services. These natural services support ecological resilience while also benefiting society and the economy. It is evident that during the planning stage, the village-centric approach to a sustainable rural economy has not received enough attention. At the local level, Chhattisgarh has devised a creative plan to bring back the agrarian economy by finding a balance between modernization and tradition.

Table 2: The concept of NGGB

Component	N - Narwa	G - Garwa	G - Ghurwa	B - Bari
Based on the idea of	Conservation of rainwater & protection of groundwater levels as well as recharge of subsoil.	Promotion and Management of livestock and income based on it & day care for the animals.	Preparation of organic compost from agricultural and livestock waste.	Backyard Farming to ensure nutrient rich food for self-consumption
Foundation	Low-cost water conservation structures such as check dams, gully controls, underground dykes at strategic locations on water streams	Protection to crops from animal grazing (increasing cropping intensity). And Fodder, water, and vaccination/ treatment facilities for the cattle.	Production of organic manure to improve soil fertility. Use of this Organic manure in Badis	Supporting backyard kitchen gardens by providing seed, seedlings, common irrigation etc.

(Source: content created by the researchers)

The goal of NGGB is to facilitate decision makers' consideration of a more integrated approach to environmental management by easing the recognition of the hidden value of ecosystem services. The maps are meant to be used as a component

of a larger conversation that incorporates different kinds of information, such as local knowledge from stakeholders, rather than to offer definitive answers. The goal is to provide decision-makers with knowledge about which regions offer particular advantages and where to find the ideal places to enhance the delivery of ecosystem services. By sharing this information, people can more easily adopt an integrated approach to their work and take a broad view of ecosystem services into account when making decisions on development or management.

Need for NGGB intervention:

The mainstream of agricultural programs consisted of input subsidies, such as those for machinery, seeds, fertilizer, and tools, which appear to have benefited businesses more than farmers. Kisan welfare issues seem to have been eclipsed by the focus on production techniques, and in the rush to modernize; traditional agricultural and cattle-care practices were abandoned. Perhaps not enough consideration has been given to the village-centric approach to a sustainable rural economy throughout the planning phase. At the local level, Chhattisgarh has devised a creative plan to bring back the agrarian economy by finding a balance between modernization and tradition.

"Narwa, Garuwa, Ghuruwa, Badi has a definite plan to accelerate the growth of agriculture. Due to insufficient water supply, only one-third of farmers in Chhattisgarh adopt double cropping. Simultaneously, the straying and movement of unclaimed livestock into farms is causing significant losses. Therefore, the Narwa component has been created to encourage the best possible use of rainwater through water management structures, replenishing the ground water table. The health and nutrition of the tribal population, which makes up 33% of the population, is particularly concerning because to the high rates of malnutrition and undernourishment among women and children." This has prompted concerns about the development of organic farming and the kitchen garden as ways to increase livestock productivity (millenniumpost_Newspaper, 2019).

Systemic solutions are actually what we need, as they would reduce the initial demand for energy and resource use. All we have to do is reject the notion that these systems require such a high resource requirement. The community needs to value the creative solutions for managing natural resources.

5.1 N- Narwa (rivulets and streams)

One of the natural resource that is present in sufficient quantities is water (britannica, 2024). It is a necessary component of life as we know it on Earth. It is extensively utilized for many different things, including drinking, cooking, cleaning, bathing, washing, and irrigation, among other commercial and residential uses. Water resources must be managed well in order to provide hydroelectricity, dependable irrigation, local water supplies, clean drinking water availability, and disaster relief.

As per the report published by the government of Chhattisgarh an SAMBAL, it quotes "it states Despite Chhattisgarh's abundant rainfall and intricate network of rivulets and streams, just 1.8 million hectares—or one-third of the state—are covered by Rabi. At the same time considering the fact that only 36% of land in the Chhattisgarh states is under irrigation. Chhattisgarh government prioritize water conservation and development of irrigated territory. Focus stood round recharging of aquifers and an increase in groundwater levels." The Narwa Program is focused on controlling and conserving groundwater levels as well as saving rainwater. The Narwa program not only keeps groundwater levels stable but also makes sure that water is properly channelled for irrigation and available throughout the summer. Low-cost water conservation structures to guarantee surface water harvesting and subsurface and groundwater recharging, such as check dams, gully controls, and underground dykes at key sites on water streams. Narwa is an effort based on science. Furthermore, it doesn't cause any harm to the environment because it doesn't replace any plants or animals. Furthermore, it helps both people and wildlife in a state where forests encompass half of the land and home to around 34% of the population, the Scheduled Tribes (SAMBAL_Chhattisgarh_Government, 2022).

Action Plan

According to the water Resource department of Government of Chhattisgarh - One Nala is chosen in each block of 33 districts of the state for the treatment from the origin to the tail; and rejuvenation of the Old structures. Construction of water impoundment structures based on GIS mapping; Primarily National watershed mission and MGNREGA - Mahatma Gandhi National Rural Employment Guarantee Act which is the government of India's rural employment guarantee scheme is being used to implement the program. In Chhattisgarh, there are 33,000 rivulets with length of 2.70 lakh kilometres overall (WRD, 2022). There are rivulets in practically every village. Water supply can be guaranteed all year round by treating these rivulets or building structures on them. This will replenish the groundwater levels in wells, ponds, hand pumps, and tube wells. Additionally, this will provide water for agricultural throughout the year.

Status of the scheme

According to the report published by the government of Chhattisgarh named after the SAMBAL- a Compendium of Public Welfare Schemes of Chhattisgarh Government, it depicts that- "in order to treat water, in the year 2020, the state administration has identified almost 28,000 drains. 8896 drains are being worked on by the department of rural development and Panchayat. Similarly, the agricultural department is working to raise the water level in 387 drains, while the state forest department is working on 3460 drains. Out of 28,000 drains selected for water treatment 12.743 drains treated (SAMBAL_Chhattisgarh_Government, 2022)."

Narva rivulet

Detailed project reports of 1300 rivulets were ready. Out of which 450 rivulets are operational and 18947 are under implementation/ construction stage.

Paybacks from the Narwa scheme

Drain treatment increased agriculture acreage by 11,564 acres. Narwa program has increased ground water level between 10 to 22 cm (NITI_for_States_Govt_of_India, 2022).

5.2 G-Garwa

The word "cattle" in Chhattisgarhi is "Garwa". Since Chhattisgarh is a state mostly focused on agriculture, livestock is important to the rural economy. The goal of the Garwa (livestock) program is to safeguard and enhance livestock, particularly milk cattle, by erecting cattle sheds, or "Gothan," in each hamlet. The Garwa component of this system provides day care for the animals while simultaneously conserving and promoting livestock-based income. Garwa includes the cultivation of fodder in designated wastelands. In addition to shielding crops from animal grazing, which is a constant threat throughout the nation, villages will get access to electricity from Gobar gas and bio fertilizer made from excrement. The villagers will gain from organic manure from composting, energy from Gobar gas, and protection from animal grazing, which intensifies cropping.

Action Plan

With assistance from MGNREGA, the veterinary and forest departments, and village Panchayat, the task will be completed. Under the supervision of gram-sabha, they would serve as "day care centres" furnished with water, and food supplies and facilities for vaccinations, AI, and treatment. Improvement and protection of livestock is achieved by giving each village cattle shed. This was accomplished by building the "Cattle Proof Trench," or CPT, and fencing off three to six acres of land based on the quantity of cattle. CPT may be regarded as one of the most effective low-cost defence against unauthorized land expansion at the village level. During intense rainfall, it nearly immobilizes runoff water, enhancing both vertical and horizontal soil moisture percolation (Kulandaive, 2010). Water facilities set up using a solar pump or pond. Dry fodder is provided by the villagers, for the livestock and at the same time planation of Shrubs and plants that provide shade for the cattle.

Status of the scheme

The government has taken the initiative to build Gothan in every village. This has ensured the productive utilisation of cattle power and increase the production of milk which will be used collectively. Post harvesting season, the ay is left unused in the field. The plan is to collect the hay and keep it aside for the utilisation in the Gothan. Till 2019 Total 10,743 Gothan sanctioned of which 9671 are functioning. Resultantly, 4927 Gothan became self-sufficient. Geo-tagging, a type of geospatial metadata is the act of adding geographical identifying metadata to various media, including webpages, SMS messages, QR Codes, geo-tagged photos or videos, and RSS feeds (wikipedia, 2021). Coordinates for latitude and longitude of each Gothan is available to the government for the monitoring. District wise Gothan and the initiative for the Geo-Tagged 9510 Gothan has been shown in Table 2.

Table 3: District Wise Geo-Tagged Gothan

S.N.	District	Total Number of Gothan	Number of Geo-Tag Gothan	Achievement
1	Balod	397	125	31
2	Balodabazar	478	369	77
3	Balrampur	296	46	16
4	Bastar	255	133	52
5	Bemetara	379	121	32
6	Bijapur	102	15	15
7	Bilaspur	470	271	58
8	Dantewada	91	22	24
9	Dhamtari	363	123	34
10	Durg	231	88	38
11	Gariyabandh	339	46	14
12	Janjgir	522	321	61
13	Jashpur	433	66	15
14	Kanker	411	167	41
15	Kawardha	449	214	48
16	Kondagaon	253	16	6
17	Korba	315	254	81
18	Koria	314	110	35
19	Mahasamund	457	199	44
20	Mungeli	293	123	42
21	Narayanpur	74	29	39
22	Raigarh	726	624	86
23	Raipur	322	153	48
24	Rajnandgaon	511	348	68
25	Sarguja	378	164	43
26	Sukma	195	21	11
27	Surajpur	456	83	18
	Total	9510	4251	44%

(Source: Government of Chhattisgarh, Agriculture Development and Farmer Welfare and Bio-Technology department, (ADFWB, 2023))

Paybacks from the Garwa scheme: The Gothan has paid women from the Self Help Group (SHG) 105.6 Crores. The Gothan is operated by 11,885 Women of SHG with 1.36 Lacks members (UAD_Govt_of_Chhattishagrh, 2023).

The interface between livestock management and the conservation of natural resources is evident in places close to rural areas, where interactions between humans, animals, and cattle are frequent. In well-balanced agricultural systems, livestock play a

beneficial role by contributing a significant portion of the nutrients needed for plant growth. Growing amounts of synthetic fertilizer have made it possible for a larger percentage of livestock products to be included in human diets and to increase the amount of food required to sustain a fast expanding human population.

5.3 G- Ghurwa

The state is currently promoting organic farming through two programs: the Jaivik Kheti Mission (a state program) and PKVY. PKVY, is being launched in 2015, the "Paramparagat Krishi Vikas Yojana", it is an expanded part of the National Mission on Sustainable Agriculture (NMSA)'s Centrally Sponsored Scheme (CSS) for Soil Health Management (SHM). The goal of PKVY is to encourage and support organic farming, which will enhance soil health. Many organic farmers apply the ideas and methods of Natural Farming, including the use of botanical pesticides, Beejamrit, Jivamrit, and so on. There are 500 hectares of organic farming under PKVY and 80 hectares under Jaivik Kheti Mission. https://naturalfarming.niti.gov.in/chhattisgarh/

The Chhattisgarh government has spearheaded improvements to organic farming and developed the nationwide BPKP plan. In 2019, 71,000 hectares of land in Chhattisgarh were used for organic farming. But only 1.5% of the net shown area was used for organic farming. Hence, Ghurwa is viewed as an affordable traditional substitute for today's costly chemical-driven farming, which may open the door for more organic farming. The concept is fruitful since previous subsidy programs, which were skewed toward nutrients alone, sharply increased the price of phosphate and potassium, which in turn produced a drop in their utilization and an imbalance in soil health. Restoring soil fertility requires promoting the use of bio-fertilizers, vermin compost, and native rural compost. Ghurwa (compost) is designed to encourage villagers to produce bio- fertiliser with the help of various schemes under agriculture and horticulture. The Ghurwa component in this scheme is focused on preparing organic compost from agricultural and livestock waste to reduce the usage of chemical fertilizers. It also aims to increase organic farming yield with increase in the farming income.

Action Plan

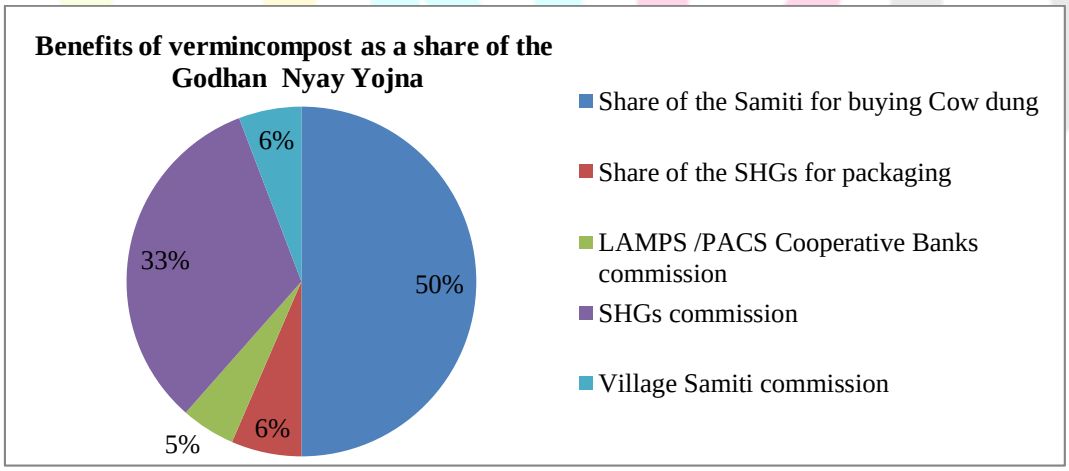
The Ghurwa scheme is intended to motivate villages to use a variety of schemes to produce organic manure. Production of organic manure using NADEP (National Agribusiness Development Programme) pits and vermi-compost under different schemes like MGNREGA. Besides this modernization of traditional Ghuruwa using scientific manner has been done. The organic manure so produced will be used in "Badis". At the same time Bio-gas plants will be supported by the CREDA (Chhattisgarh State Renewable Energy Development Agency).

Status of the scheme

By November 2022, 6.05 lakh vermin compost tanks installed in farms, Bari across the state. 50 lakh quintal of vermin compost produced from 6.5 lakh composed pits. And 96,386 vermin compost tank have been installed in Gothan. This Gothan has produced 26.00 lakh quintals of Vermi Compost.

Paybacks from the Ghurwa scheme

The Chhattisgarh government has chosen to support organic farming as a means of enhancing rural livelihoods. In July 2020, it introduced the Godhan Nyay program, which aims to raise the incomes of farmers and cattle ranchers while also promoting organic compost, lowering the use of chemical fertilizers, and enhancing soil health. Additionally, the plan called for paying Rs 2/kg for animal manure, turning it into vermi-compost, and selling it to farmers for Rs 8/kg to Rs 10/kg. Considering the selling price of vermin-compost Rs 10 per kg, the share of the samiti for buying cow dung is Rs 5 per kg. Share of the SHGs (Self Help Groups) for packaging is Rs 0.65 per kg. Share of the LAMPS (Large Area Multipurpose Society) & PACS (Primary Agriculture Credit Society) as well as cooperative banks commission includes Rs 0.50 per kg. Share of SHGs commission is Rs 3.27 per kg. And the village samiti commission is .58 per kg. Graph 1, shows the benefits of vermin-compost as a share of the Godhan Nyay Yojna.



Graph 1: Benefits from Godhan Nyay Yojna

(Source: Department of Agriculture and Farmers Welfare, Mantralaya, Raipur, Chhattisgarh)

Natural Resource management and waste management are synonymous terms. This is true because resource consumption is a requirement for both trash generation and waste handling. It is crucial to adhere to the three 'R's - Reduce, Reuse, and Recycle of waste management in order to avoid using excessive amounts of resources for waste management. While natural resource

management seeks to maximize resource utilization, waste management (WM) primarily tries to minimize waste in order to achieve the ideal system.

5.4 B- Bari

The word "Bari" or "Baadi" in Chhattisgarhi is "Kitchen Garden". Its aim is to promote the growing of fruits and vegetables in the backyards of village homes as a convenient way to supplement the diet and as a regular source of extra money for the villagers. Baadi is to promote the growing of fruits and vegetables in the backyards of village homes as a convenient way to supplement the diet and as a source of extra money for the villagers. The Departments of Land Administration and Horticulture will contribute to the growth of backyard kitchen gardens by supplying fertilizer, seedlings, and community wells that are powered by solar energy. This program encourages backyard farming, a long-standing method of producing organic produce for rural sustenance while guaranteeing that there is nutrient-rich food available for individual consumption in rural areas. The rural farmers also sell these freshly picked vegetables and fruits to get extra money.

Action Plan

The Bari will be built next to farmers' homes in their backyards, or badis. Water supply will be made through the dug-well using MGNREGA and solar pumps to irrigate a group of 4 to 5 farmers' Badis. It has been planned to use high-quality seeds for the fast growing variety of fruits and vegetable. Manure compost pits will be employed in each Badi. This will result in decrease in import of vegetable from other state and households will consume nutritious cuisine.

Status of the scheme

Over 3.77 lakh Baris developed in 146 blocks of state. 3912 community Baris developed in Gauthans. Baris helped 39,090 women's self-help groups. Women SHG (Self Help Groups) receive ₹ 10 crores under the Bari program.

A kitchen garden or Bari is a patch that is grown in the backyard of a home using the waste water from the kitchen. Benefits of having a kitchen garden: Offer nutrient-dense fresh fruits and vegetables. Provide produce that is free of harmful chemicals. Growing numbers of people are searching for fresh produce free of pesticides, which has led to the popularity of 'Bari' in Chhattisgarh in recent years. They not only have many health benefits, but growing their own food also makes them feel proud and fulfilled.

6. CHALLENGES BEFORE THE NGGB SCHEME

To ensure the people' long-term active involvement is the first challenge. At the same time to collaborate and continue inspiring the vast majority of farmers and Self Help Groups (SHGs) from all backgrounds, geographical, social, economic, and cultural to work together is also a challenge before the system. The ability and vision of local administration, as demonstrated by elected Panchayat members, people, and the government, is crucial to the effective management of the region's physical and human resources.

7. CONCLUSION

Mahatma Gandhi's concepts of Gram Swaraj and the empowerment of the rural economy are intimately linked to NGGB. The result of the innovative approach for the natural resource management could be summed up as the large-scale creation of local jobs through the investment of labour and skill from rural areas. Secondly, the uniqueness of the program will boost the rural economy by improving agricultural and animal husbandry and generating plenty of jobs. This idea is an experiment meant to establish the groundwork for prosperity in Chhattisgarh's villages.

The campaign is special because, in contrast to other government initiatives, it does not have a set budget or workforce. The 'four' essential indigenous inputs of agriculture i.e. NGGB, will be the main focus of collaboration between various government agencies and PRIs, ensuring best use of available resources to achieve measurable outcomes. As a step toward continuity, the "Suraji Gaon Yojana" could become a model for restoring Indian agriculture (Govt_of_Chhattishgarh, 2023). One of the concrete examples of the State's authority to manage natural resources is the NGGB, which serves as a tool for resource management. Fundamentally, Chhattisgarh's natural resource management is about using and controlling natural resources "for the maximum prosperity of the individuals," as the constitution provides guidelines. The implication of these clauses is that the community, under Government and community governance, has the right to produce from these natural resources.

Nearly every nation in the world uses the concept of environmentally sound, sustainable development when defining development. It undoubtedly affects how natural resource management is carried out. Above all, it suffices to state that all actions taken during the management of natural resources must adhere to environmentally sound and sustainable standards. In Chhattisgarh, traditional natural resource management plays a significant role in conserving biodiversity; yet, the long-term viability of these approaches is seriously subject to the governments' initiatives.

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