

Details of the project conducted under ICAR- Mahatma Gandhi Integrated Farming Research Institute, Piprakothi, Motihari, East Champaran, Bihar

Title of the project (project code):	Development and assessment of goat based integrated farming models in wetland ecosystem. (NRMAMGIFRISIL20200070010)
Institute-funded/externally funded	Institute-funded
Project time: Period of development/ evaluation/validation	01.11.2020 to 31.03.2024
Developers (Lead and Associates)	Lead: Dr. P. K. Bharti , Sr. Scientist (LPM), ICAR-MGIFRI, Piprakothi, Associate: • Dr. S. K. Purbey, PS (Fruit Science) • Dr. Ravi Kumar, Scientist(Fishery Resource Management)
Objective of the project	i. To develop goat based integrated farming models with crop and fish components under wetland ecosystem ii. To study the nutrient use efficiency and economic feasibility of goat based IFS model under wetland ecosystem
Treatment details	• The project was aimed to develop and assess two models based on integration of goat enterprise with crop module (Model-I) and goat-crop with fishery opponents (Model-II). One acre (approx. 4000 square meter) land area was allocated for each model under wetland ecosystem of East Champaran district of Bihar. • The study was conducted at the institute research farm, ICAR-MGIFRI, Piprakothi, East Champaran, Bihar. • The East Champaran district is situated between 26° 16' North to 27° 1' North latitude and the longitude between 84° 30' East to 85° 16' East. The Piprakothi is situated at latitude of 26° 54' North and longitude of 84° 93' East. • Two IFS models viz Model-I (goat -crop integration) and Model –II (goat-crop-fish integration) were developed in waterlogged ecosystem of East Champaran district.

Summary of the project (Bullet point)	• The total area allocated for goat-crop integrated model was one acre. The area allocation for goat housing and its associated structure like open fencing, manure pits, fodder unit development was 20 percent of the total area allocated under this model. The remaining 80.0 percent (3200 sq.) was allotted for crop production which included field crop (45 percent of total) and vegetables (35 % of the total land under this model). • IFS Model-II (Goat+ Crop+ Fish): The total area allocated for goat-crop integrated model was one acre. The area allocation for goat housing and its associated structure like open fencing, manure pits, fodder unit development was 20 percent of the total area allocated under this model. The area allotted for field crop production, vegetable and fish production was 35%, 25% and 20% of total area of project, respectively. • Introduction of Black Bengal goat as animal resource in the IFS unit was done first time at institute research farm of ICAR-MGIFRI, Piprakothi • Low lying land was partially modified through land shaping and converted in to trenches (pond) and raised bed (grazing area) near the goat shed were accomplished. • A total of three trenches (pond) and three raised bed structures were prepared for fish farming and availing fodder to goats, respectively.
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Output of the project: Yield/productivity gain/ Saving of water, labour, time, and energy/ increase in water use efficiency	• The average body weights of goats at the time of kidding was 17.57 ± 0.09 and 17.88 ± 0.10 for Model-I and model-II, respectively. The total mortality percent was 11.4 percent and still birth 4.2 percent. Most of the goat kids attained body weight of 10-11 kg at the age of 8-9 months, i.e the age at marketing. • Production of rabi crops in Model I & II: The yield of wheat for Model-I and model-II was 4580 kg/ha and 4300 kg/ha, respectively. The yield of maize for Model-I and model-II was 7933 kg/ha and 9950 kg/ha, respectively. • <i>Stocking of Fish fingerlings under IFS model-II (2020-21 and 2021-22)</i>: The dimension of pond 30 m x 20 m (600 square meter water area) and bund area of 200 square meter. The total number of stocked fingerlings for Catla, Grass carp, Rohu, Naini and Common carp was 200, 125, 125, 125 and 125, respectively. The body weight of fish was recorded at monthly interval. • The pH of pond water was 7.98 (slightly alkaline). The average temperature of pond water was 24.8°C, alkalinity was 173.38 ppm, hardness 196.20 ppm, dissolved oxygen 7.36 ppm and conductivity 1.38mS/cm. • The average survival rate of fish was 92 .1 percent and productivity was 5086.35 kg/hectare. • • The adaptability trials on developed goat based IFS was conducted at farmers, field. A baseline survey was done and 38 farmers from 27 villages and 13 blocks of East Champaran district were selected to carry experiment on goat based IFS. • Nutrient flow analysis of goat-based IFS was done based on energy equivalent of various products produced and incurred inputs in various components of IFS. • Total average output of energy in the IFS system (per acre) was 6366 MCal in IFS-I and 6320 in IFS-II. The average Net energy generated in the IFS-I and IFS-II was 3922 and 2982 MCal. The energy use efficiency of the entire IFS system was 2.62.
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Cost effectiveness, including B:C ratio	The average benefit: cost ratio for the IFS Model-I and IFS model-II (for three consecutive years) was 2.16 and 2.40. The overall average of IFS was 2.28 for a period of three years.
Validation technology followed (within the Institute, collaborators, multilocation/multi-site testing at farmers' fields)	Yes, at the institute as well as farmers field
Proposed stakeholders	Farmers
Publications/photos/video clipping, if any	Research abstract P. K. Bharti, S. K. Purbey, A. K. Singh, Ravi Kumar and S. K. Samal. 2022. Development and evaluation of goat based integrated farming system for small and marginal farmers of north Bihar. (In) National conference on Landscape Management for Preventing Flood and Reservoir Sedimentation (LMPFRS-2022) organized by Indian Association of Soil and Water Conservationists, Dehradun; held at Birsa Agricultural University (BAU), Ranchi wef 22-24 September 2022. P41 P. K. Bharti, S. K. Purbey, Ravi Kumar and Shreya Nivesh and K G Mandal. 2023. Goat-based integrated farming system (IFS) for improving livelihood of small and marginal farmers under waterlogged ecosystems in Bihar. ABSTRACT for international Conference on “<i>Impact of climate changes on global food, livestock, livelihood and environmental security: advanced approaches and mitigation strategies</i>” held at Navsari Agricultural University, Navsari (Gujarat) w.e.f. 28-30 December 2023; p 338. P. K. Bharti, Ravi Kumar, Vikas Paradkar, S. K. Purbey. 2023. Role of digital market platform in enhancing goat market intelligence. ABSTRACT for International Conference on “<i>Driving agriculture Forward:Recent Trends and</i>

Innovations in Agricultural Market Intelligence”
held at Anand Agricultural University, Anand
(Gujarat) w.e.f. 11-13 December 2023; p 278-279

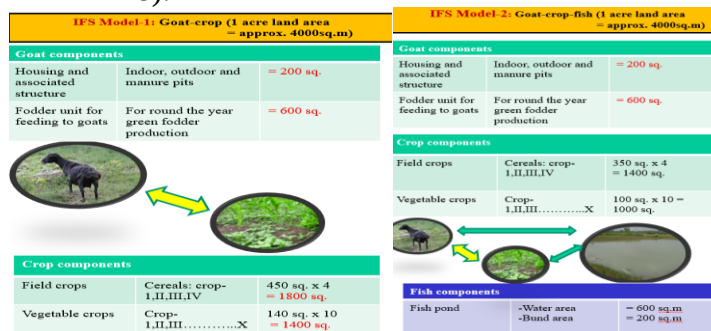
Book

P. C. Chandran, P.K. Bharti, Reena Kamal, Shailendra Kumar Rajak, A. Dey and Kamal Sharma. 2023. Profitable goat farming, Satish Serial Publishing House, New Delhi pp 1-139 (ISBN: 978-81-95734-42-9)

Extension folder

- i. P. K. Bharti, Ravi Kumar and Koushik Banerjee. 2022. Scientific goat farming for enhancing livelihood of farmers in north Bihar (in English). Published by the Director, ICAR-MGIFRI, Piprakothi.
- ii. P K Bharti, S K Purbey, Ravi Kumar, S K Samal, Shreya Nivesh and Koushik Banarjee. 2023. Uttari Bihar ke Jal jamao kshetra me bakri palan vyvsay dwara ajivika suraksha. Published by ICAR-MGIFRI, Piprakothi, Motihari.

Technology developed entitled: Goat-based integrated farming system (IFS) for small and marginal farmers under waterlogged ecosystems in East Champaran district, Bihar, received on the eve of foundation day of the ICAR on 16th July 2024 (Certificate No ICAR-NRM-MGIFRI 2024-128).



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