PN-AAN-884 Research Project #4

IAAS

Institute of Agriculture and Animal Science

of the

TRIBHUVAN UNIVERSITY

MUCIA

Midwest Universities Consortium for International Activities

IAAS Faculty Project for Strengthening Agricultural Research

INSTITUTE OF AGRICULTURE AND ANIMAL SCIENCE

Funded by: U.S. Agency for International Development

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Administered by Michigan State University

PREFACE

A new farmer-oriented research program is underway. Until recently, the Institute of Agriculture and Animal Sciences has been able to commit only small amounts of funds to support research. At the same time, more than forty faculty members have received graduate level training, often with a strong research emphasis, abroad. And twenty more faculty members will return to the Institute over the next two years.

To meet this critical financial limitation and to more firmly establish a professional commitment to continuing research among IAAS faculty, new funds have been set aside under the MUCIA program. These funds have proven to be a great stimulus to research, demonstrating in a relatively short time that appropriate incentives will stimulte the latent research talent located at IAAS and move the Institute's research program forward. This represents an enormous potential for addressing the agricultural needs of small farmers in the Chitwan area.

Appendix I attached to this report contains general supplementary guidelines to the Revised Research Proposal Form for IAAS Research originally, dated 9 March 1981. These guidelines have been reviewed by AID officials and IAAS administrative personnel and are intended to direct scholarly review of research proposals as well as to meet contractual requirements for accountability of funds. Appendix II attached contains a complete list of the reports approved to date under this program.

DUCK-CUM-FISH CULTURE

A RESEARCH PROPOSAL

Prepared by:

K. T. AUGUSTHY

NAME OF PROJECT: Duck-Cum-Fish Culture Research Project

PROJECT LEADER: K. T. Augusthy

COLLABORATOR: M. K. Shrestha

Review of Literature

For nutritional and economic reasons, fish production is vital for Nepal. The average annual consumption of animal protein in Nepal was only 4.5 kg. per person in 1974-75 and only 0.2 kg. of that came from fish ([10]Silpachai 1980). Higher production of fish will ultimately improve nutrition and will bring fish within economical reach of the Nepalese. The price of fish has risen from Rs. 10 to Rs. 22-24 in Chitwan in the past five years. Now in Kathmandu, fish fetch a price as high as Rs. 22-26 . ([2]Augusthy K. T. 1982).

An attempt is made in this review of literature to show that the quantity of fish and duck production projected in the research project proposal is justifiable. The first part of the review of literature deals with the production of fish and duck. A brief review of literature regarding polyculture, fish feed, fertlizing and manuring the pond is also given because these are specific to the project plan.

There is no reliable data in available literature on duck and fish production in Nepal. Therefore, more reliable local information obtained by personal contact with traditional fishermen and knowledgeable fish farmers has been incorporated to justify that projected production is achievable.

". . .Where there is abundant water, there are great advantages in culturing fish in water which is actually flowing. There can, for example, be a very dense stocking per unit area of the pond, for the water will bring abundant oxygen, and will flush away any by-product of fish or their food which inhibit growth" ([5]Hicking 1971).

[1]Anon (1952) reports intensive carp culture in a pond in the Gumma Perfecture in Japan. The pond had a volume of 27.2 cubic meters, had a water flow of 0.36 cubic meters per second, and was stocked with fish at the rate of 30 kg. per cubic meter. In one year, the weight of the fish became 278 kg. per cubic meter.

[8]Kawamoto (1957) describes two ponds in Jakasaki, Japan. By having abundant water flow, in nine months one pond could produce 88 kg. and the other 46 kg. of fish per cubic meter.

Compared with this high production rate is our projected production rate of 4000 kg. of fish per year from an IAAS fish pond having a water-holding capacity of 1666 cubic meters. This amounts to be only 2.5 kg. of fish per cubic meter of water per year, but we expect this to be more feasible.

[7]Kalidas Shurestha (1981), a fish farmer at Sharadanagar, Rampur, Chitwan, Nepal, cultivated fish from 1979 through 1981 in the same type of marshy area where the IAAS fish pond is to be constructed. His land runs down from the low-lying area of the IAAS livestock farm to Sharadanagar. Kalidas was personally contacted in 1981 in connection with the fisheries extension programs of IAAS. The fish on his farm, Common carp and Grass carp, grew to an average weight of 2 kg. per year without any supplementary food. This can be attributed to the high fertility of the humus-accumulated marshy area and the running water which flows abundantly through his ponds. However, his farm has two scientific problems:

1) The depth of water is only 2 to 3 feet. If more depth were allowed, there could be more volume of water per unit area of pond surface and hence more fish production due to the increased production of fish food organisms.

2) The farm was shaded by trees, and Kalidas was growing more trees around the ponds "for providing shade to the fish." Shading ponds is harmful because it reduces primary production of microscopic algae and photosynthetic bacteria which in turn affects the food chain.

Because these two problems won't exist in the IAAS fish pond, more fish production per unit volume of water can be expected. Moreover, because ducks are incorporated into the IAAS fish pond, an increased fish production can be expected.

Duck-cum-fish culture at Hetuda fish farm of the Nepalese Terai shows that a duck can release 37 kg. of manure per year on an average ([13]Singh 1979). However, no data has been tabulated in the literature regarding the increase of fish production at Hetauda fish farm due to duck-raising. The experiments conducted in East Germany by [9]Schaperclaues (1959) show that duck-raising could increase fish production from 286 kg./ha. per year to 353 kg./ha. per year.

At Hetauda Fish Farm the cost of duck-raising is very high ([13]Singh 1979) because of the low food conversion ratio. However, no data has been computed to prove the intensity of high cost. The high cost of duck-raising at Hetauda was attributed to the fact that the ducks were fenced in and confined to the pond, but at IAAS, the ducks will be allowed to roam in the adjoining marshy area to "graze" and so can be brought to the pond to manure it at a constant time every day. Because these ducks can get sufficient natural food from the farm in mollusks, worms, frogs, insect larvae and aquatic weeds from the adjoining marshy area, the supplied food given to them can be minimized and therefore make the project more economical. Moreover, at the IAAS farm, because ducks are eating protein food from the marshy area, their excreta will have better fertilizing qualities for the pond than the excreta of the ducks kept at

Hetauda fish farm fed purely on a diet rich in carbohydrates, such as rice bran and wheat powder. Thus, ducks at IAAS fish pond are not simply "biological machines", to shed manure into the pond, but can be considered to be "biological robots" that pick up the protein-rich, naturally-hidden food of the marshy area, convert it to high-quality manure and carry and shed it into the pond to increase fish production.

The ducks at Hetauda fish farm could produce only 78 eggs per hen while ducks reared by the Tharu people, the traditional fishermen of the Nepalese Terai who always live in colonies adjoining the marshy land and natural water bodies, produced 150 eggs per hen per year ([6]Kaji Derai 1982). This number is almost double that of the Hetauda fish farm. This high production can be attributed to ducks reared by the Tharus getting more protein-rich natural food from the natural water bodies.

Perhaps better egg production results than the Tharus have could be expected from ducks reared at IAAS, due not only to better management practices than the Tharus, but also due to the large marshy area available at IAAS for ducks to "graze."

All items of food in a pond can be used by culturing fish with non-competitive feeding habits (polyculture or composite fish culture). When a single species of fish is stocked (monoculture), only a certain kind of food which that fish prefers is used. Other items of food existing in the biological chain of the pond do not directly result in any yield in monoculture. By introducing various species of fish having different feeding habits, all kinds of food in a pond will be used to yield more fish. Thus the same pond yields more fish by polyculture than monoculture ([11]Sinha V.R.P. 1972, [12]Sinah V.R.P. and Sharma V.K. 1976). The varieties of fish used for polyculture in the IAAS fish pond are Grass carp, Silver carp, Bighead carp and Common carp.

Dr. T. G. Pillai, Project Manager of FAO/UNDP has developed the food formula, cowdung 50% + wheat flour 25% + oil seed cake 10% + rice bran 15% suggested in the research proposal. Experience in Nepal has shown that the feed conversion ratio of this formula ranges from 5:1 to 20:1 ([10]Silpachai 1980). Food conversion rate will be assessed in the IAAS fish pond.

The doses of calcium, phosphate and organic fertilizers as specified in the research proposal can result in increased fish production. Moreover, the addition of organic fertilizer mixed with phosphate fertilizer in the required quantity will enable biological nitrogen fixation in ponds by blue green algae and photosynthetic bacteria ([3]Augusthy K.T. 1979, [4]Bal Ravi 1975). This will result in increased primary production and hence the production of more fish food organisms.

As mentioned earlier, a review of literature on fish production in Nepal shows that no planned experiment has been conducted to specifically compute fish or egg production, so that the data published in the research papers are not convincing and dependable even though given. (Data are not generally tabulated for published research papers). Therefore, no scientific literature on fisheries published from Nepal is suitable for basing fish or duck production experiments.

The IAAS research project on duck-cum-fish culture is planned to get necessary information regarding fish and duck production in a fish pond scientifically managed. The results will apply to testing in specialized localities in the district of Chitwan or elsewhere in Nepal.

REFERENCES:

1. Anon 1952. Inland Water Fisheries and Aquaculture in Japan. Fisheries Agency, Napanese Govt. April 1952.

2. Augusthy K.T. 1982. Personal Experience from 1976 through 1982.

3. Augusthy K.T. 1979. Fish Farming in Nepal, pp. 63-67.

4. Bal Ravi, P.S. Nitrogen fixation - Back to Nature? Science Today, Dec. 1975, pp. 15-21.

5. Hickling C.F. 1971. Fish culture Faber and Faber London, pp. 207-10.

6. Kaji Derai 1982. Personal Communication.

7. Kalidas Shrestha 1981. Personal Communication.

8. Kawamoto, N.Y. 1957. Production during intensive carp culture in Japan. Progs. Fish Culturist, Vol. 19, No. 1, 1957.

9. Schaperclaues, W. 1959. Die Karpfenteichswirtschaft in der Deutsche Demokratischen Republik. Sitz. Ber. Bd. VII H & T F. Deutsche Akad. Landwirtschaftwiss. Berlin, 1958.

10. Silpachai Damrong (UNICEF Kathmandu) 1980. Report on Travel to Nepal, p. 4 and 6.

11. Sinha, V.R.P. 1972. Composite Fish Culture in India, Indian Farming Sept. 1972, pp. 118-119.

12. Sinha V.R.P. and Sharma V.K. 1976. Composite Fish Culture in Large Sheets of Water, Indian Farming, May 1976, pp. 30-32.

13. Singh D.M. 1979. Economic Aspect of Duck Farming in Hetauda Commercial Fish Farm, Proceedings of the Fourth National Fisheries Seminar pp. 57-59.

DUCK-CUM FISH CULTURE RESEARCH PROJECT

Introduction: The project is profit-oriented. The fish and ducks will be grown together in the same pond* and fish, male ducks and duck eggs will be marketed. The data computed on the format attached with the plan can be interpreted for valuable research studies. The specific objectives of this project are to:

1) Raise fingerlings in the nursery pond and to grow them to survive the attack of predators such as frogs and snakes;

2) Perform various management activities such as feeding fish, feeding ducks, adjusting the pond fertility by applying manure and by releasing ducks, and calculation of growth rate of ducks and fish;

3) Compute the food conversion ratio of ducks and fish;

4) Compute the economic feed conversion ratio of ducks and fish; and

5) Compute and study the impact of variations in water temperature on the rate of food consumption by the fish.

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* Please see Addendum.

Nature of the Project:

The project starts on March 18 with the cleaning of the nursery pond into which the fingerlings will be stocked. There will be four species of fish as shown :

S. No.	Name of fish	Number of fingerlings to be stocked in the production pond	Extra Number of fingerlings to be purchased taking mortality into consideration	Total number of fingerlings to be purchased
1.	Silver carp	1000	500	1500
2.	Grass carp	500	250	750
3.	Bighead carp	1000	500	1500
4.	Common carp	1500	750	2250

Fingerlings will be grown in a nursery pond until April 28, and then will be transferred to the production ponds on April 29. They will be grown in the production pond until June 10, when they should be large enough to survive attack by ducks. The ducks will then be released into the pond. Ducks will serve as "living machines" to manure the pond. Fish will continue to grow until November 30, and then will be harvested and marketed.

Fish are harvested in winter (December 1) because they do not grow in the low temperature of winter. After harvesting, the production pond can be cleaned for stocking next year. We anticipate that female ducks will start laying eggs by this time,

so the ducks from these eggs can continue to be raised along with the fish of the next year. Male ducks can be marketed.

The four species of fish are stocked and grown together in the same pond (polyculture) to get more yield than obtainable by growing a single species of fish (monoculture).

Because the fish pond, the duck house and related establishments are permanent structures they can be used for many years. Livestock also can be incorporated in this project after two years.

Operation of the Project:

All the five points given on the 37 WEEKS CALENDAR should invariably be followed for the successful operation and completion of the project.

MATERIALS AND METHODS:

A production pond and nursery pond are to be made in the marshy area adjoining the livestock farm. The nursery pond will be used to rai· fingerlings. The mature fingerlings will be released, fed and grown in the production pond.

A duck house, a store, an office, and a watchman's house will be constructed on the sloping land adjoining the marshy area. Duck-cum-fish culture will be practiced.

Use of the Project in Teaching and Research:

From the data entered on Proforma No. 1, 2, and 3, the following can be studied and analyzed for research and teaching:

1) Growth rate of fish

2) Growth rate of ducks

3) Food conversion ratio of fish

4) Food conversion ratio of ducks

5) Economic feed conversion ratio of fish

6) Economic feed conversion ratio of ducks

7) The impact of variations in temperature on the rate of food consumption by fish.

37 WEEKS CALENDAR

Week No.	Date range	Week No.	Date range
1.	March 18 to 24	19.	July 22 to (28)
2.	March 25 to 31	20.	July 29 to Aug. 4*
3.	April 1 to 7	21.	Aug. 4 to (11)
4.	April 8 to 14*	22.	Aug. 12 to 18*
5.	April 15 to (21)	23.	Aug. 19 to (25)
6.	April 22 to 28*	24.	Aug. 26 to Sep. 1*
7.	April 29 to May (5)	25.	Sept. 2 to (8)
8.	May 6 to 12*	26.	Sep. 9 to 15*
9.	May 13 to (19)	27.	Sep. 16 to (22)
10.	May 20 to 26*	28.	Sep. 23 to 29*
11.	May 27 to June (2)	29.	Sep. 30 to Oct. (6)
12.	June 3 to 9*	30.	Oct. 7 to 13*
13.	June 10 to (16)	31.	Oct. 14 to (20)
14.	June 17 to 23*	32.	Oct. 21 to 27*
15.	June 24 to (30)	33.	Oct. 28 to Nov. (3)
16.	July 1 to 7*	34.	Nov. 5 to 10*
17.	July 8 to (14)	35.	Nov. 11 to (17)
18.	July 15 to 21*	36.	No. 18 to 24*
		37.	Nov. 25 to Dec. (1)

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1) See the above calendar, and in that note the * marked dates on which are recorded the average weight of fish as in Proforma No. 1.

2) See the dates circled, and on those dates, record the average weight of ducks as in Proforma No. 2.

3) Weight of food supplied to fish daily is to be entered in Proforma No. 3.

4) Weight of food supplied to fish daily and also water temperature are to be entered in Proforma No. 3.

5) Follow the above instructions strictly. Also, see the CALENDAR OF OPERATIONS which follows, and proceed accordingly until harvesting the fish.

CALENDAR OF OPERATIONS

Week No. & Date Range	DATE	Production Pond	Date	Nursery Pond
1 March 18 to 24	March 18 to 24	---------- ----------	March 18-20	Clean the pond and sun-dry it
March 21				Add six inches soil and sun-dry
March 22, 23				Continue sun-drying
March 24				Fill the pond with water and cover it with nylon net to prevent the entry of frogs.
2 March 25 to 31	March 25-31	---------- ----------	March 25-31	Broadcast organic and phosphate fertilizer in powder form daily at 9 a.m.
3 April 1 to 7	April 1-4	Clean the production pond	April 1	Release the fingerlings to to the nursery pond
	April 5	Add quicklime at the rate of 500 kg. per ha.	April 1-7	Feed the fingerlings in a fixed place in the pond with the yellow of poultry egg daily at 9 a.m.

CALENDAR OF OPERATIONS (Continued)

Week No. & Date Range	Date	Production Pond	Date	Nursery Pond	Date	Ducks
4 April 8 to 14	April 8 to 14	Broadcast organic and phosphate phosphate fertilizer daily to pond at 9 a.m. to develop the planktons*	April 8 to 14	Feed the fingerlings daily with this food: 50% yellow of poultry egg and 50% wheat powder by weight	April 8 to 14	
5 April 15 to 21	April 15 to 21	" "	April 15 to 21	"	" April 15	Ducklings are brought and kept in duck house. They are fed by: Rice bran 30% + Mustard Oil cake 30% + Maize flour 40%; also allow them to roam in the surrounding marshy area, not in the pond.
6 April 22 to 28	April 22 to 28	" "	April 22 to 28	" "	April 22 to 28	" "

* 1 kg. cowdung and 158 gms of superphosphate are mixed together in powder form. (Rate: 10 kg. organic fertlizer per ha. per day and 1.42 kg. superphosphate per ha. per day).

CALENDAR OF OPERATIONS (Continued)

Week No. & Date Range	DATE	Production Pond	Date	Ducks
7 April 29 to May 5	a) April 29 8 a.m. b) April 29 to May 5	Release the fingerlings into the ponds from the nursery pond *Feed the fish in a fixed place at 9 a.m. with the following food: Cowdung 50% + Wheat flour 25% + Mustard oil cake 10% + Rice bran 15% (while feeding daily at 9 a.m., record the water temperature)	April 20 to May 5	" " " "
8 Week 8 to week 13 (May 6 to June 9)		Daily operation as in week 7 (b)	May 6 to June 9	
13 June 10 to 16	June 10	as in week 7 (b)	June 10	Release ducks into the pond
	June 10 to 16	as in week 7 (b)	June 10 to 16	As in week 8
Week 14 to 37	June 17 to Nov. 30	as in week 7 (b)	June 17 to to Nov. 31	" "
	Dec. 1 to 7	Harvest and market the fish	Dec. 1 to 7	Market the male ducks. Female ducks will be kept for laying eggs the next year.

* Grass carp can be grown by feeding Guinea grass and alfalfa which can be cultivated near the pond.

PROFORMA NO. 1

Year _____

S. No.	Month and Date	Average Weight of Fish				Remarks
		Silver carp	Grass carp	Bighead carp	Common carp	
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

PROFORMA NO. 2

Year _____

S. No.	Month and Date	Average Weight of Ducks	Remarks
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

PROFORMA NO. 3

Year _____

Date	Water Temperature	Weight of Food to be Given: Fish	Weight of Food to be Given: Ducks	Remarks
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

PROFORMA NO. 3 (Continued)

Year_____

Date	Water Temperature	Weight of Food to be Given: Fish	Weight of Food to be Given: Ducks	Remarks
23				
24				
25				
26				
27				
28				
29				
30				
31				

ADDENDUM: Duck-Cum Fish Culture (Research Proposal).

Only a single fish pond was planned in the original research proposal on Duck-cum-Fish culture which was approved in principle by the IAAS Research Committee. Later, following discussions with research participants, it was recommended that the fish pond be divided into four small ponds having equal volumes of water by erecting three partitions.

These partitions allow different experiments to be conducted in these ponds. The first set of experiments can be as shown below.

Pond 1	Pond 2	Pond 3	Pond 4
Fish fed on supplied food + Daily fertilizing and manuring as explained in the original proposal	Fish fed on supplied food	Fish fed on supplied food + Ducks fertilize the pond by their excreta.	Fish fed on supplied food + Fertilizing and manuring as in pond 1 + Azolla is allowed to grow covering the whole water surface.

Each pond will be stocked with a total of 1,000 fish (250 fish each of Grass carp, Silver carp, Big head carp and Common carp).

Footnote: The fish are fed with food as explained in the original proposal. Ducks must not be allowed to enter ponds 1, 2 and 4. Quicklime will be added in each pond at the rate of 500 kg./ha. before stocking with fish.

Thus, the number and species of fish in each pond are kept the same. This is different from the explanation on page 1 of the original proposal. The volume and rate of flow of water in each pond will be kept the same.

Other than the specific objectives described on page 1 and 2 of the original proposal, the following can also be studied by the four different treatments shown above.

1. Impact of fertilizing and manuring to increase fish production by comparing the data of pond 1 and 2.

2. Impact of manuring the pond by ducks to increase fish production (by comparing the data of pond 3 with that of pond 1 and 2).

3. By comparing the data of pond 4 with pond 1, the impact of keeping Azolla in the fish pond will be known for fish production. Azolla shades the pond water surface, preventing penetration of sunlight into the pond water, and therefore fish food organisms production in this pond, pond 4, are likely to be lower than in pond 1.

4. There are differences in the quantity of supplied food consumed by fish in each pond. The quantity of supplied food consumed by fish in different ponds is likely to vary due to the probable differences in the production of natural fish food organisms due to the different treatments.

APPENDIX I

SUPPLEMENT TO THE REVISED
RESEARCH PROPOSAL GUIDELINES FOR IAAS RESEARCH
AS OF JULY 1982

APPENDIX I

SUPPLEMENT TO THE REVISED

RESEARCH PROPOSAL GUIDELINES FOR IAAS RESEARCH

AS OF JULY 1982

I. MUCIA RESEARCH FUNDING PROCEDURES

A. The research proposal is submitted to IAAS research committee by researcher:

1. Departments or divisions may do prior screening of proposals.

2. The research committee is composed of:

   a. One member from each department.

   b. Dean or Assistant Dean.

   c. MUCIA Chief-of-Party.

   d. Invited participants including the proposed research leader or research team, interested faculty members and outside agency representatives.

3. Each proposal should include a clear statement of:

   a. Reason for studying the problem.

   b. Researcher's knowledge of the problem including discussions with farmers, co-workers, and other professionals.

   c. Review of literature.

   d. How this research is related to continuing professional interests of researcher.

4. As stated in the 1981 Joint Annual Review, how this research relates to future planning in researcher's department in these areas:

   a. Teaching

   b. Extension

   c. Research

B. If favorably recommended by the research committee, MUCIA research fund commitment will be made by the signature of the Dean or his designate and the MUCIA Chief-of-Party or his designate.

C. If research is more than six months, provision will be made for biannual review. A shorter review period may be set by the research committee.

D. At termination of any funded phase of research an end-of-project report shall be submitted outlining research results and budget expenditures. Additional research funds to the listed research leader shall not be authorized until the previous research report is submitted.

E. Funds released to IAAS from the MUCIA research fund and not expended for the specified research shall be returned to MUCIA with the end-of-project report.

II. RESEARCH COMMITTEE POLICY QUESTIONS

A. General Emphasis

1. Nepalese agriculture and related problems.

2. Farm-related problems.

3. Multidisciplinary problems.

4. Areas not now emphasized but needing support.

B. Major Research Thrusts and Consequent Policy Question

1. The policy question is whether IAAS shall cover as wide a range of subjects as the research interests of its faculty or whether it shall concentrate the majority of research and money on three or four main topics over the next four or five years. There is support for both views and this is a critical decision for IAAS at this stage of development.

C. Specific Research Areas to be Considered

1. Production

a. Crops produced and reasons. Influence of diseases and pests on production and utilization.

b. Production emphasis for soils use and factors other than production influencing soils use.

c. Emphasis for horticulture research and reasons.

d. Animals to be be used for livestock research, and reasons for using them. The focus is on health and nutrition, and on new breeds.

2. Farm Management

   Help farmers and their families better use their resources to improve their quality of life and the quality of life in Nepal.

3. Home Economics

   Presently in Nepal this area receives minimal attention, but it is critically important for the future well-being of Nepalese families.

4. Rural Development

   Farmers, their families and rural neighbors live in a matrix of institutions. Institutions are created to improve life but some institutions have lost their usefulness. The question is how we can improve the institutions of education, communication, transportation, health, credit and markets which will improve quality of rural life.

   R. D. research widely includes social, economic, cultural and political factors. Choosing first priority topics requires much deliberation.

APPENDIX II

IAAS/MUCIA AGRICULTURAL RESEARCH PROGRAM

APPROVED RESEARCH PROJECTS

AS OF JULY 1982

APPENDIX II

IAAS/MUCIA AGRICULTURAL RESEARCH PROGRAM

APPROVED RESEARCH PROJECTS

AS OF JULY 1982

Project #1. Soybean Research and Extension in Chitwan: Principle researcher, K. P. Sharma in collaboration with S. P. Katel, S. B. Gurung, S. M. Shrestha, S. C. Shah, and R. Poudel. Several research activities will be conducted to test the hypothesis that low initial seed moisture content and seed storage conditions are more critical factors than genotypes and duration of storage in preserving soybean seed viability.

Project #2. A Case Study of the Farming Systems of Sharadnagar Panchayat: Principle researcher, P. M. Tulachan. The researcher will conduct a baseline study of farming systems in the Sharadnagar Panchayat to identify current practices and socio-economic and physical constraints faced by farmers. This material will be used to develop a farming systems handbook to be used as a reference by researchers and planners and in the agricultural economics curriculum.

Project #3. Mapping and Characterization of Major Soils of the IAAS Farm at Rampur: Principle researcher, B. R. Khakural in collaboration with H. B. Foth and J. R. Joshi. A complete mapping of soils on the IAAS farm and their classificatior according to physical and chemical properties will be done

to aid in the placement of experimental plots to determine the applicability of research results to other farms.

Project #4. Duck Cum Fish Culture Research: Principle researcher, K. T. Augusthy in collaboration with M. K. Shrestha. In this study, the researchers will test the economic viability of a duck/fish pond culture and examine the impacts of various food sources for ducks and fish on their growth rates.

Project #5. Year Round Production of Vegetables in Rampur: Principle researcher, Rishi R. Adhikari in collaboration with Durga D. Dhakal and Ram C. Koirala. The purpose of this project is to develop a planting schedule for year round vegetable production for home consumption and sale by farmers of Chitwan District.

Project #6. Survey and Identification of Plant Parasitic Nematodes in Chitwan: Principle researcher, M. H. Khan. The project will identify plant parasitic nematodes associated with vegetables, legumes, fruits, and other economically important crop plants, and their population and distribution in relation with hosts in different localities in Chitwan as a first step towards their control and the prevention of crop losses.

Project #7. Studies on Chemical Control of Root-Knot Nematodes of Okra and Eggplant: Principle researcher, L. N. Bhardwaj in collaboration with S. M. Shrestha and R. C. Koirala. This project will evaluate the effective dose of furadan necessary to control root-knot diseases of okra and eggplant under local conditions.

Project #8. Studies of the Effect of Seed Dressing and Foliar Sprays on Seedling Health and Blast and Brown Spot Diseases of Paddy: Principle researcher, L. N. Bhardwaj in collaboration with S. M. Shrestha, M. H. Khan, and Moti Lal. This project will test the effectiveness of fungicides in reducing losses of rice seedlings in nursery beds.

Project #9. Effect of Date of Sowing and Nitrogen Levels on the Incidence of Rice Blast and Leaf Spot at the Nursery Stage: Principle researcher, S. M. Shrestha in collaboration with L. N. Bhardwaj, R. B. Chhetry, and Moti Lal. In this study, S. M. Shrestha will test the hypothesis that the date of sowing and nitrogen levels are the critical factors affecting the suceptability of Masuli variety rice seedlings to blast and leaf spot at the nursery stage.

Project #10. Evaluation of the B.Sc. (Ag.) Program at IAAS, Rampur: Principle researchers, B. N. Pokharel and G. P. Shivakoti. The researchers will make recommendations for the improvement of the B.Sc. Program based on the results of a survey of faculty, students, and former students and their immediate supervisors.