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Date of Birth 1st June, 1964

Sex Male

Academic qualifications

1. Ph.D. (2001) in Zoology from Utkal University, Vani Vihar, Bhubaneswar, Odisha India.
2. M.Sc. (1984) in Zoology from Utkal University, Vani Vihar, Bhubaneswar, Odisha India.

Awards/ recognition received

1.	Received “Krishak Bandhu” award from Krisak samaj, Odisha during 2011 for aquaculture developmental work in three backward districts of Odisha under NAIP project.
2.	Appreciation letter received from “nr International (UK)” for installation and operation of FRP carp hatchery in Diptipur, Odisha under “Western Orissa Rural Livelihoods Project” during 2007-08 creating awareness on carp seed production and aquaculture in the area.
3.	Received “Young Scientist Award” during the year 2006 from the Institute.
4.	Aquaculture Production and Environment division (APED) received “Best Section” from the Institute during 2006 and myself is one of the member of APED.
5.	Appreciation letter received from the Deputy Director General (Fisheries), ICAR during 2006-07 for the “successful breeding and larval rearing of <i>Pangasius Pangasius</i> ”.
6.	Appreciation letter received from the Deputy Director General (Fisheries), ICAR for the successful breeding and rearing of an endangered catfish <i>Horabagrus brachysoma</i> during 2005-06.

Research Experience and current activities

1.	Finfish/catfish breeding and rearing
2.	Rural development through aquaculture activities

Current Research Projects

1.	Outreach activity on fish feed
2.	Sustainable livelihood improvement through integrated freshwater aquaculture, horticulture and livestock development in Mayurbhanj, Keonjhar and Sambalpur districts of Orissa

3.	Seed production in Agricultural crops and fisheries
4.	Seed production and grow-out culture of indigenous catfish, magur through training and demonstration in North-Eastern states (Assam & Manipur)

Completed Projects

1.	Mass production of fry and fingerlings, and culture of <i>Clarias batrachus</i>
2.	Breeding and culture of Indian catfishes
3.	Processing and recycling of fish and animal offals as the fish meal substitute in the diet of fish
4.	Qualitative and quantitative assessment of gonad and gametes of Indian major carps through induced breeding with GnRH based inducing agents and carp pituitary extract
5.	Encycling and recycling of animal, fish waste and slaughter house blood as fish meal substitute in fish feed
6.	Breeding and culture of <i>Pangasius pangasius</i>
7.	Breeding and culture of Mahanadi Mahaseer, <i>Tor mosal mahanadicus</i> (David)
8.	Mass seed production and growout culture of diversified catfishes: <i>Pangasius pangasius</i> and <i>Horabagrus brachysoma</i>
9.	Development of flow-through system for industrial aquaculture
10.	Breeding and culture of large Indian catfishes
11.	Setting up a portable FRP carp hatchery in Bargarh district (Consultancy mode)

Products commercialised/released

1.	Central Institute of Freshwater Aquaculture in 2008 commercialized “FRP Magur Hatchery” to M/s. M R Aqua tech, Bhubaneswar, Odisha) in which I am the core team member to develop the FRP hatchery for Magur.
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2.	Immunoboost-C has been developed to enhance immunity in Indian carps. The product was commercialized to M/S. Star Aqua Lab, West Bengal.
3.	“STARTER- M” magur Larval diet has been developed to wean Clarias batrachus (Magur) larvae. This feed was officially released at this Institute by the Hon’ble Union Minister for Agriculture, Mr Sarad Pawar on 26 th December, 2004. This feed is nutritionally balanced and highly palatable for baby magur. It ensures faster growth and high survival of larvae.
4.	Starter- Pangas, a larval feed has been developed to wean P. pangasius larvae. This feed was officially released at Indian Council of Agricultural Research, New Delhi by the Secretary DARE, Director General, ICAR during April, 2011. This feed is nutritionally balanced and highly palatable for Pangas larvae. It ensures faster growth and high survival of larvae.
5.	Pangas Grow-1, a Pangasfry feed has been developed to feed P. pangasius fry. This feed was officially released during Farmers meet in Calcutta by the Vice-Chancellor, West-Bengal University of Animal husbandry and Veterinary Science during April, 2010. This feed is nutritionally balanced and highly palatable for Pangas fry. It ensures faster growth and high survival of fry.
6.	Pangas Grow-1, a Pangasfry feed has been developed to feed P. pangasius fry. This feed was officially released during at CIFA by the Secretary DARE, Director General, ICAR during January, 2012. This feed is nutritionally balanced and highly palatable for Pangas fry. It ensures faster growth and high survival of fry.

Publications

1. Books Authored

(i)	Gupta, S.D., Mohapatra, B.C., Routray, P., Sahoo, S.K. and Verma, D.K. (2008). Text book of breeding and hatchery management of carps. Narendra Publication, New Delhi. Pp 163.
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(ii)	Ayyappan, S., Jena, J.K., Sahoo, S.K. , Sarkar, S.K., Satpathy, B.B. and Nayak, P.K. (1999). National Freshwater Aquaculture development Plan. CIFA, Bhubaneswar. Pp. 75.
(iii)	Ayyappan, S., Jena, J.K., Sarkar, S.K. , Satpathy, B.B., Nayak, P.K. and Sahoo, S.K. (1998). Strategies for increasing fish production from freshwater aquaculture in India. CIFA, Bhubaneswar. Pp. 58.
(iv)	Ayyappan, S., Jena, J.K. and Sahoo, S.K. (1997). National Freshwater Aquaculture development Plan-Orissa CIFA, Bhubaneswar. Pp. 48.
2. Books/documents Edited	
(i)	Proceedings of “National workshop and stakeholder meet on fish feeds” (Eds. K.N. Mohanta, S.C. Rath, A. Saha, B.N. Paul, S.K. Sahoo and S.S. Giri) held during 2011 at CIFA, Bhubaneswar. Pp. 20.
(ii)	Proceedings of the Workshop on “Portable hatchery for better carp seed production” (Eds. N. Sarangi, B.C. Mohapatra, P. Sahu, S.K. Sahoo , S. Mohanty and K.K. Sharma) held during 2007 at CIFA, Bhubaneswar. Pp. 11.
(iii)	Compedium of Abstracts, The Fifth Indian Fisheries Forum(Eds. S. Ayyappan, J.K. Jena, P.K. Sahoo, S.K. Sahoo ,S.N. Mohanty, S.C. Mukherjee, K. Kumar, S.K. Swain and B.B. Sahoo) organized by AFSIB & CIFA during 2000 at Bhubaneswar. Pp. 169.
(iv)	Souvenir, The Fifth Indian Fisheries Forum (Eds. S. Ayyappan, J.K. Jena, P.K. Sahoo, S.K. Sahoo , S.N. Mohanty, S.C. Mukherjee, K. Kumar, S.K. Swain and B.B. Sahoo) organized by AFSIB & CIFA during 2000 at Bhubaneswar. Pp.125.
(v)	S. K. Sahoo , R. Kumar, P. K. Tiwari, B. R. Pillai, S. S. Giri. (Eds.), 2018. Training Manual on Mass Breeding and Culture Technique of Catfishes. SAARC Agriculture Centre, Dhaka, Bangladesh, 180 pp.
(vi)	S. S. Giri, S. M. Mohammad, B. N. Paul and S. K. Sahoo (Eds.), 2020. Diversification in Aquaculture Towards Achieving Sustainability, 192pp, SAARC Agriculture Centre, Dhaka; ISBN- 978-984-34-6739-3.

3. Articles Published in Journals

(i)	Ferosekhan, S., Giri, A. K., Sahoo, S.K. , Radhakrishnan, K., Pillai, B.R., Giri, S.S. and Swain, S. K. (2021). Maternal size on reproductive performance, egg and larval quality in the endangered Asian catfish, <i>Clarias magur</i> . Aquaculture Research , 24(11): 5168-5179.
(ii)	Ferosekhan, S., Sahoo, S.K. , Radhakrishnana, K., Velmurugan, P., Shamna, N., Giri, S.S. and Pillai, B.R. (2020). Influence of rearing tank colour on Asian catfish, magur (<i>Clarias magur</i>) and pangas (<i>Pangasius pangasius</i>) larval growth and survival. Aquaculture , 521: Article no, 735080.
(iii)	Sahoo, S. K. , Ferosekhan, S., Giri, S.S., Radhakrishnan, K., Panda, D., SriHari, M. and Pillai B. R. (2019). Length–weight relationship and growth performance of different life stages of hatchery-produced magur, <i>Clarias magur</i> (Hamilton, 1822). Aquaculture Research , 50: 1431-1436.
(iv)	Ferosekhan, S., Sahoo, S.K. , Giri, S.S., Das, B.K., Pillai, B.R., Das, P.C. (2019). Broodstock development, captive breeding and seed production of bagrid catfish, Mahanadi rita, <i>Rita chrysea</i> (Day, 1877). Aquaculture , 503: 339-346.
(v)	Nayak, S., Ferosekhan, S., Sahoo, S.K. , Sundaray, J.K., Jayasankar, P. and Burman, H. K. (2016). Production of fertile sperm from in vitro propagating enriched spermatogonial stem cells of farmed catfish, <i>Clarias batrachus</i> . Zygote 24(6): 814-824.
(vi)	Sahoo, S. K. , Giri, S. S., Paramanik, M. and Ferosekhan, S. (2015). Larval age at stocking, growth, and survival during fingerling production of the endangered sun catfish, <i>Horabagrus brachysoma</i> . Journal of Applied Aquaculture 27: 144-149.
(vii)	Sahoo, S. K. , Giri, S. S., Chandra, S. and Sahu, A. K. (2010). Stocking density-dependant growth and survival of Asian sun catfish, <i>Horabagrus brachysoma</i> (Gunther 1864) larvae. Journal of Applied Ichthyology 26: 609-611.
(viii)	Sahoo, S. K. , Giri, S. S., Chandra, S. and Sahu, A. K. (2010). Stocking density-dependant growth and survival of Asian sun catfish, <i>Horabagrus brachysoma</i> (Gunther 1864) fry during hatchery rearing. Journal of Applied Aquaculture 22: 86-91.

(ix)	Sahoo, S. K., Giri, S. S. and Chandra, S. (2010). Threatened fishes of the world: <i>Clarias batrachus</i> (Linn. 1758). Environmental Biology of Fishes 88: 85-86.
(x)	Sahoo, S. K., Giri, S. S. and Chandra, S. (2008). Induced spawning of <i>Clarias batrachus</i> (Linn.): effect of Ovaprim doses and latency periods on the weight of stripped eggs and ovary. Asian Fisheries Science 21: 333-338.
(xi)	Sahoo, S.K., Giri S.S. and Chandra, S. (2008). Rearing performance of <i>Clarias batrachus</i> larvae: effect of age at stocking on growth and survival during fingerling production. Aquaculture 280: 158-160.
(xii)	Sahoo, S. K., Giri, S. S. and Chandra, S. (2008). Effects of latency periods and injection doses with carp pituitary extract on spawning performance and egg quality of Asian catfish <i>Clarias batrachus</i> (Linn.). Journal of Applied Aquaculture 20: 295-303.
(xiii)	Sahoo, S.K., Giri S.S., Chandra, S. and Mohapatra, B. C. (2008). Evaluation of breeding performance of Asian catfish <i>Clarias batrachus</i> at different dose of HCG and latency period combinations. Turkish Journal of Fisheries and Aquatic Science 8: 249-251.
(xiv)	Swain, P., Dash, S., Sahoo, P. K., Routray, P., Sahoo, S. K., Gupta, S. D., Meher, P. K. and Sarangi, N. (2007). Non-specific immune parameters of brood Indian major carp <i>Labeo rohita</i> and their seasonal variations. Fish & Shellfish Immunology 22: 38-43.
(xv)	Sahoo, S. K., Giri, S. S., Chandra, S. and Sahu, A. K. (2007). Spawning performance and egg quality of Asian catfish <i>Clarias batrachus</i> (Linn.) at various doses of human chorionic gonadotropin (HCG) injection and latency periods during spawning induction. Aquaculture 266: 289-292.
(xvi)	Sahoo, S. K., Giri, S. S., Chandra, S. and Sahu, A. K. (2007). Effect of Ovaprim doses and latency periods on induced spawning of <i>Clarias batrachus</i> : observation on larval deformity. Indian Journal of Experimental Biology 45: 920-922.
(xvii)	Sahoo, S. K., Giri, S. S., Mohanty, J. and Sahu, A. K. (2006). Evaluation of HCG-delivery systems and levels on spawning of Asian catfish, <i>Clarias batrachus</i> (Linn.). Journal of Applied Aquaculture 18: 59-70.
(xviii)	Sahoo, S. K., Giri, S. S. and Sahu, A. K. (2005). Induced spawning of Asian catfish, <i>Clarias batrachus</i> (Linn.): effect of various latency periods and SGRHa and

	domperidone doses on spawning performance and egg quality. Aquaculture Research 36: 1273-1278.
(xix)	Sahoo, S. K. , Giri, S. S. and Sahu, A. K. (2005). Effect on breeding performance and egg quality of <i>Clarias batrachus</i> (Linn.) at various doses of Ovatide during spawning induction. Asian Fisheries Science 18: 77-83.
(xx)	Sahoo, S. K. , Giri, S. S. and Sahu, A. K. (2004). Effect of stocking density on growth and survival of <i>Clarias batrachus</i> (Linn.) larvae and fry during hatchery rearing. Journal of Applied Ichthyology 20: 302-305.
(xxi)	Giri, S. S., Sahoo, S. K. , Sahu, A. K. and Meher, P. K. (2002). Effect of dietary protein level on growth, survival, feed utilisation and body composition of hybrid <i>Clarias</i> catfish (<i>Clarias batrachus</i> x <i>Clarias gariepinus</i>). Animal Feed Science and Technology 104: 169-178.

4. Other articles/communications

(i)	Sahoo, S.K. , Ferosekhan, S., Giri, S.S., Paramanik, M. and Radhakrishnan, K. (2018). Reports on common deformities in induced bred <i>Horabagrus brachysoma</i> larvae. Journal of Entomology and Zoology Studies 6(3): 462-465.
(ii)	Sahoo, S.K. , Ferosekhan, S., Saha, A., Giri S.S. and Paramanik, M. (2017). <i>Embryonic and larval development of an endangered catfish, Horabagrus brachysoma</i> . Indian Journal of Animal Research 51(1): 15-20.
(iii)	Chandra, S., Singh, S.K., Dasgupta, S. and Sahoo, S. K. (2015). Mass specific oxygen uptake in the freshwater catfish <i>Wallago attu</i> (Bloch & Schneider, 1801). Indian Journal of Fisheries 62(3): 137-140.
(iv)	Sahoo, S. K. , Giri, S. S., Paramanik, M. and Ferosekhan, S. (2015). Larval age at stocking, growth, and survival during fingerling production of the endangered sun catfish, <i>Horabagrus brachysoma</i> . Journal of Applied Aquaculture 27: 144-149.
(v)	Sahoo, S. K. , Giri, S. S. and Paramanik, M. (2014). Effect of carp pituitary extract dose and latency period combinations on the stripping response of <i>Clarias batrachus</i>

	(Linnaeus, 1758) during induced spawning operation. Indian Journal of Fisheries 61:128-130.
(vi)	Sahoo, S. K. , Giri, S. S., Paramanik, M. and Ferosekhan, S. (2014). Preliminary observation on the induced breeding and hatchery rearing of an endangered catfish, <i>Horabagrus brachysoma</i> (Gunther). International Journal of Fisheries and Aquatic Studies 1: 117-120.
(vii)	Sahu, B. B., Sahoo, S. K. , Giri, S. S., Das, P. C., Mishra, B., Sahu, A. K., Eknath, A. E. and Jayasankar, P. (2013). Carcass traits of two marketable size classes of <i>Pangasius pangasius</i> (Hamilton. 1822). Journal of Applied Ichthyology 29: 226-229.
(viii)	Garnayak, S. K., Mohanty, J., Rao, T. V., Sahoo, S. K. and Sahoo, P. K. (2013). Vitellogenin in Asian catfish, <i>Clarias batrachus</i> : Purification, partial characterization and quantification during the reproductive cycle by ELISA. Aquaculture 392-395: 148–155.
(ix)	Sahoo, S. K. , Giri, S. S., Gupta, S. D. and Sahu, A. K. (2012). Effect of animal origin feeds and frequency of feeding on growth, survival and cannibalism in <i>Wallago attu</i> (Schneider) larvae during hatchery rearing. Asian Fisheries Science 25: 66-74.
(x)	Giri, S. S., Sahoo, S. K. , Mohanty, S. N. and Sahu, A. K. (2011). Effect of dietary protein levels on growth, feed utilization and carcass composition of endangered bagrid catfish <i>Horabagrus brachysoma</i> (Gunther 1864) fingerlings. Aquaculture Nutrition 17: 332-337.
(xi)	Sahoo, S. K. , Giri, S. S., Chandra, S. and Sahu, A. K. (2010). Stocking density-dependant growth and survival of Asian sun catfish, <i>Horabagrus brachysoma</i> (Gunther 1864) fry during hatchery rearing. Journal of Applied Aquaculture 22: 86-91.
(xii)	Sahoo, S. K. , Giri, S. S. and Sahu, A. K. (2010). Evaluation of HCG dose and latency period combinations on the weight of stripped eggs during induced spawning of <i>Clarias batrachus</i> (Linn.). Indian Journal of Fisheries 57: 83-85.
(xiii)	Giri, S. S., Sahoo, S. K. and Mohanty, S. N. (2010). Replacement of by-catch fishmeal with dried chicken viscera meal in extruded feeds: effect on growth, nutrient utilisation

	and carcass composition of catfish <i>Clarias batrachus</i> (Linn.) fingerlings. Aquaculture International 18: 539–544.
(xiv)	Sahoo, S. K. , Giri, S. S., Chandra, S. and Sahu, A. K. (2009). Observation on larval deformity during induced spawning of walking catfish, <i>Clarias batrachus</i> (Actinopterygii: Siluriformes: Clariidae), at different combinations of human chorionic gonadotropin dose and latency period. Acta Ichthyologica Et Piscatoria 39: 43-45.
(xv)	Sahoo, S. K. , Giri, S. S. and Sahu, A. K. (2010). Evaluation of HCG dose and latency period combinations on the weight of stripped eggs during induced spawning of <i>Clarias batrachus</i> (Linn.). Indian Journal of Fisheries 57: 83-85.
(xvi)	Giri, S. S., Sahoo, S. K. and Mohanty, S. N. (2010). Replacement of by-catch fishmeal with dried chicken viscera meal in extruded feeds: effect on growth, nutrient utilisation and carcass composition of catfish <i>Clarias batrachus</i> (Linn.) fingerlings. Aquaculture International 18: 539–544.
(xvii)	Sahoo, S. K. , Giri, S. S., Chandra, S. and Sahu, A. K. (2009). Larval rearing of eel, <i>Macrogathus aculeatus</i> (Lacepede) under different rearing conditions: a preliminary study. Indian Journal of Fisheries 56: 47-49.
(xviii)	Sahoo, S. K. , Giri, S. S. and Sahu, A. K. (2004). Effect of stocking size of <i>Clarias batrachus</i> fry on growth and survival during fingerling hatchery production. Asian Fisheries Science 17: 229-233.
(xix)	Sahoo, S. K. , Giri, S. S., Sahu, A. K. and Ayyappan, S. (2003). Experimental hybridization between catfish <i>Clarias batrachus</i> (Linn.) X <i>Clarias gariepinus</i> (Bur.) and performance of the offspring in rearing operations. Asian Fisheries Science 16: 157-166.
(xx)	Giri, S. S., Sahoo, S. K. , Sahu, A. K. and Mukhopadhyay, P. K. (2000). Nutrient digestibility and intestinal enzyme activity of <i>Clarias batrachus</i> (Linn.) juveniles fed on dried fish and chicken viscera incorporated diets. Bioresource Technology 71: 97-101.

Popular Articles

(i)	Sahu, A. K. & Sahoo, S. K. : 1998. Culture possibilities and potentials of Asian catfish, <i>Clarias batrachus</i> . <i>Fishing Chimes</i> , 17: 32-33.
(ii)	Sahu, A. K., Sahoo, S. K. & Ayyappan, S.: 2000. Seed production and hatchery management of the Asian catfish <i>Clarias batrachus</i> . Fishing Chimes , 19: 94-96
(iii)	Sahoo, S. K. , Giri, S. S. & Sahu, A. K.: 2004. Entry of African catfish into India: an overview of its impact on Indian fisheries. Fishing Chimes , 24: 42-43
(iv)	Giri, S. S., Paul, B. N., Sahoo, S. K. , Rangacharyulu, P. V., Rath, S. C. & Mohanty, S. N.: 2010. Fish oils and cardio-vascular health. Fishing Chimes , 30: 37-39.
(v)	Sahoo, S. K. , Giri, S. S., Chandra, S. & Sahu, A.K.: 2010. Management in seed rearing of Asian catfish, <i>Clarias batrachus</i> , in hatchery conditions. <i>Aquaculture Asia</i> , 15: 23-25.
(vi)	Sahoo, S. K. , Giri, S. S. and Chandra, S.: 2011. Management in seed production of an endangered catfish, <i>Horabagrus brachysoma</i> during its hatchery phase. Aquaculture Asia , 16: 26-30.
(vii)	Swain, S. K., Ikmal, S. S., Parida, S., Patro, B., Sahoo, S. K. , Rajesh, N., Meher, P. K., Jena, J. K. and Jayasankar, P. 2011. Success story of the Barakhandapat ornamental fish breeding unit at Patana cluster of Keonjhar, Odisha, India. Aquaculture Asia , 16: 11-13.
(viii)	Chandra, S. and Sahoo, S.K. : 2012. Fish-pigion pea cultivation-drawing on synergistics. Infofish International , 6: 30-33.
(ix)	Sahu, B. B., Sahoo, S. K. , Giri, S. S., Das, P. C., Mishra, B. P., Samal, R. P., Sahu, A. K., Jayasankar, P., Eknath, A. E. : 2013. Processing and value addition of yellow tail <i>Pangasius</i> catfish. Infofish International , 3:36-38.
(x)	Swain, S. K., Baliarsing, B. K., Sahoo, S. K. , Meher, P. K., Patro, B., Rajesh, N., Dash, P. C., Jayasankar, P. and Jena, J. K. 2013. A success story of Maa Tarini Self Healp Group Ornamental Fish Unit, Purunia Village, Keonjhar District, Odisha, India. Aquaculture Asia , 18:20-24.

(xi)	Sahoo, S. K. and Paramanik, M. (2014). An endangered ornamental catfish. Science Horizon 4: 38-39.
(xii)	Sahoo, S. K. , Ferosekhan, S., Paramanik, M. and Swain, S. K. (2014). Hatchery production of the yellow catfish <i>Horabagrus brachysoma</i> in India. World Aquaculture , 45 (4): 52-54.
(xiii)	Sahoo, S. K. , Ferosekhan, S., Giri, S. S. and Swain, S. K. (2016). Recent trends in breeding and seed production of Magur in India. World Aquaculture , 47(2): 59-62
(xiv)	Sahoo, S.K. , Ferosekhan, S. and Giri, S.S. (2018). Current know how and possibility for growout culture of an endangered catfish, <i>Horabagrus brachysoma</i> . Aquaculture Asia , 22(2):11-14.
(xv)	Sahoo, S.K. , Ferosekhan, S. and Giri, S.S. (2019). Some facts for the grow-out culture of an endangered catfish, <i>Clarias magur</i> . Aquaculture Asia , 23(2): 13-15.
(xvi)	Ferosekhan, S., Sahoo, S.N., Giri, S.S. and Sahoo, S.K. (2021). Scenario of Captive production of <i>Clarias magur</i> . Aquaculture Asia , 24(1): 10-13.
(xvii)	Sahoo, S.K. , Ferosekhan, S., Sahoo, S.N. and Giri, S.S. (2021). Some facts on cannibalism in <i>Wallago attu</i> and its management during captive seed production. Aquaculture Asia , 25(3): 15-18.

Bulletins/ Leaflets

1.	Giri, S.S.; Sahoo, S.K. , Mohanty, S. N. and Sahu, A.K. (2011). Starter-Pangas, pangas larval diet.
2.	Giri, S. S., Sahoo, S. K. , Sahu, A. K. and Chakraborty, P. P. and Mandal, S. C. (2011). Starter-Pangas, Bachaa Pangaser Prarambhik Khabar (in Bengali language).
3.	Giri, S.S.; Sahoo, S.K. , Sahu, A.K. and Mohanty, S. N. (2007). Starter-M, magur larval diet.
4.	Sahu, A.K. and Sahoo, S.K. , Giri, S.S. and Chandra, S. (2007). Deshimagur ka prajanan, bij Utpadan ebam palan.
5.	Sahu, A.K. and Sahoo, S.K. , Giri, S.S. and Chandra, S. (2006). Breeding, seed production and culture of Asian catfish, <i>Clarias batrachus</i> .