

TRANSACTIONS OF THE JAPANESE
SOCIETY OF IRRIGATION, DRAINAGE
AND RURAL ENGINEERING
No.259

Contents

Research Papers

On Analysis of Flow Fields of a River for Water Activity Preferred by Children	KAKUDO H. and NISHIYAMA M. ... 1
Genetic Variation and Diversity of Japanese Loach Inferred from Mitochondrial DNA – Phylogenetic analysis using the cytochrome <i>b</i> gene sequences –	KOIZUMI N., TAKEMURA T. WATABE K. and MORI A. ... 7
Real-Time Flood Forecasting System Based on Simple Lumped Rainfall-Runoff Models Combined with Channel Flow Routing Model Using Particle Filter	KUDO R., CHIKAMORI H. and NAGAI A. ... 17
Fodder Resource Uses and Assessment of Nitrogen Flows on Livestock Farming with Crop Production	SHIRAHASE K. and KOBAYASHI H. ... 27
Effects of Imidacloprid and Fipronil Insecticide Application on the Larvae and Adults of <i>Sympetrum frequens</i> (Libellulidae: Odonata)	JINGUJI K., UEDA T., GOKA K., HIDAKA K., and MATSURA T. ... 35
Evaluation for Additional Resistance by Lightweight Thrust Restraint on Pressure Pipe Bend	SAWADA Y., KAWABATA T., MOHRI Y. and UCHIDA K. ... 43
Relationship between Land-use Agglomeration and Nitrate Nitrogen Concentration of River Water in the Shari and Abashiri Region of Hokkaido, Japan	OKAZAWA H., TAKEUCHI Y. and SAMURA I. ... 53
Examination for Predicting Consolidation Settlement by Measurement Records – Prediction of settlement by using neural network model –	KANAYAMA M., YAMASHITA H., HIGASHI T. and OHTSUBO M. ... 61
Determination of Partial Factors for Verification of Bearing Capacity of Shallow Foundations beneath Open Channels	MURAKAMI A., NISHIMURA S., SUZUKI M., MORI M., KURATA T. and FUJIMURA T. ... 71

Technical Papers

Change of Landscape Structure before and after Winter Olympic Games in Nagano City	FUJII Y. and TAKEDA T. ... 79
--	-------------------------------

The Usage of Lot-management Water on the Plots at the Green House

..... SAKATA S., NAKAMURA K., MITSUNO T. and KAWASHIMA S. ... 87

The Feature and Subjects of the Disaster Assessment Operated in the Area Stricken by the Mid-Niigata Prefecture Earthquake in 2004

..... ARITA H. ... 93

Applicability of Phytoextraction with *Arabidopsis halleri* ssp. *gemmifera* to Remediate Cd-contaminated Andisols

..... KAMEYAMA K., TANI S., SUGAWARA R. and ISHIKAWA Y. ... 99

TRANSACTIONS OF THE JAPANESE
SOCIETY OF IRRIGATION, DRAINAGE
AND RURAL ENGINEERING
No.260

Contents

Research Papers

Model Experiments and Elasto-Plastic Finite Element Analysis about Seepage Failure of Sand Behind Fixed Sheet Pile	OKAJIMA K., TANAKA T., Zhang Shanji and KOMATSU T. ... 1
Research on Characteristics of Turbid Water Effluent from Paddy Fields during the Paddling and the Transplanting Period – Based on a study of paddy watershed in Uso river basin, Japan –	SUDO M., MIKI T. and MASUDA Y. ... 7
Habitat Distribution of Denitrifier and Denitrification Activity in the Tidal Flat of the Interior Parts of the Ariake Sea	KOGA A., SEGUCHI M. and KORIYAMA M. ... 15
Effect of Wind and Soil Moisture on the Wind-Drift Caused by Wind Erosion – The case of volcanic ash soil fields in Okunakayama Highland, Iwate prefecture –	ARIMORI M., ENDO Y. and KOBAYASHI T. ... 23
Changes in Temperature and Fate of Soil Organic Matter in an Andisol due to Soil Surface Burning	OBUCHI A., NISHIMURA T., MIZOGUCHI M., IMOTO H. and MIYAZAKI T. ... 31
Leaping Behavior of Ayu and Its Relation to Depth of Pool	MABUCHI K., HIRAMATSU K. and ITAGAKI H. ... 39
Evaluating on Agricultural Practices for Effective Sediment Yield Reduction on Sugarcane Fields, Okinawa	NODA K., OSAWA K., IKEDA S. and OZAWA K. ... 47
Effects of Grain-Size Distribution, Iron Oxide, and Organic Matter on Sedimentation and Self-Weight Consolidation of Thoroughly Disturbed Soft Marine Clay	KONDO F. and TORRANCE J. Kenneth ... 57
Reliability Analysis for Bearing Capacity of Open Channel	MURAKAMI A., NISHIMURA S., SUZUKI M., MORI M., KURATA T. and FUJIMURA T. ... 69
Characteristics of Nitrogen Balances of Large-scale Stock Farms and Reduction of Environmental Nitrogen Loads	HATTORI T. and TAKAMATSU R. ... 77
Computational Method to Analyze Internal Erosion and Transport of Soil Particle	FUJISAWA K., MURAKAMI A. and NISHIMURA S. ... 85

Leakage Reduction Effect by Multiple Cracking Feature of High Performance Fiber Reinforced Cement
Composite

..... UENO K., NATSUKA I. and ISHII M. ... 95

Technical Papers

Applicability of ELISA-based Determination of Pesticides for Groundwater Quality Monitoring

..... TSUCHIHARA T., YOSHIMOTO S., ISHIDA S. and IMAIZUMI M. ... 101

Diagnostic Study of Hydraulic and Water Serviceability Functions to Rehabilitate Irrigation Canal Systems

..... MIHARU K., TANAKA Y., MUKAI A., TARUYA H. and NAKA T. ... 113

Note

Behavior of Dissolved Organic Matters in Percolated Water through Top Soil in Paddy Field in the Beginning
of Inundation Period

..... HAMADA K., KOMATSU K., KUBOTA T., HITOMI T., SHIRATANI E. and TAKAKI K. ... 121

Discussion

Seepage Flow along Outlet Conduit in Reservoir Embankment

- Restraint of piping failure with flexible conduit - (Trans. JSIDRE No.255, pp.56 ~ 68 Jun.2008)

Question YOSHITAKE Y. ... 123

Answer FUJITA N. ... 125

TRANSACTIONS OF THE JAPANESE
SOCIETY OF IRRIGATION, DRAINAGE
AND RURAL ENGINEERING
No.261

Contents

Research Papers

Comparative Effect of Bio-waste Ashes on Strength Properties of Cement Mortar	
..... AJAY Goyal, HATTORI K., OGATA H., ASHRAF Muhammad and AHMED Mohamed Anwar	1
Processing of Sugarcane Bagasse ash and Reactivity of Ash-blended Cement Mortar	
..... AJAY Goyal, HATTORI K., OGATA H. and ASHRAF Muhammad	11
Genetic Structure of Loach Population in Yatsu Paddy Field	
– A case study of the Shitada River basin in Chiba Prefecture using microsatellite DNA –	
..... KOIZUMI N., TAKEMURA T., MORI A. and OKUSHIMA S.	21
Evaluation of Runoff Detention Function of the Paddy Field Installed with Runoff Control Devices	
..... YOSHIKAWA N., NAGAO N. and MISAWA S.	31
Watershed Scale Evaluation of Flood Mitigation Function of Paddy Fields Installed with Runoff Control Devices	
..... YOSHIKAWA N., NAGAO N. and MISAWA S.	41
Runoff Characteristics of Nitrate Nitrogen in a Yatsu Agricultural Catchment During Rainfall Events	
..... KATO T., SOMURA H., OSAWA K. and KURODA H.	49
Influence of a Percolation Pattern on the Cadmium Concentration, the Growth and the Yields of Rice in Cadmium Polluted Paddy Fields	
..... SASAKI C., MATUYAMA N., KUBOTA M., NODA K. and KATO K.	57
Effect of Repulsive Force on the Visco-elastic Properties of a Montmorillonite Suspension	
..... NAKAISHI K. and OOI S.	65
Burst Speed of Wild Fishes under High-Velocity Flow Conditions Using Stamina Tunnel with Natural Guidance System in River	
..... IZUMI M., YAMAMOTO Y., YATAYA K. and KAMIYAMA K.	73

Technical Paper

Immigration and Migration of Fish to Paddy Fields for Early Crop Rice	
..... MINAGAWA A., TAKAKI K., GOTO M. and TARUYA H.	83

Notes

- Organ Specific Carbon Stable Isotope Ratio of Tokyo Daruma Pond Frog MORI A., WATABE K., KOIZUMI N. and TAKEMURA T. ... 93
- Relation between TOC and COD_{Mn} in Drainage from a Paddy Field HITOMI T., MIURA A., HAMADA K., YOSHINAGA I., KUBOTA T. and SHIRATANI E. ... 95

Notice for Photocopying

If you wish to photocopy any work of this publication, you have to get permission from the following organization to which licensing of copyright clearance is delegated by the copyright owner.

〈All users except those in USA〉

Japan Academic Association for Copyright Clearance (JAACC)
6-41 Akasaka 9-chome, Minato-ku, Tokyo 107-0052, Japan
Phone : 81-3-3475-5618 FAX : 81-3-3475-5619 E-mail : info@jaacc.jp

〈Users in USA〉
Copyright Clearance Center, Inc.
222 Rosewood Drive, Danvers, MA 01923 USA
Phone : 1-978-750-8400 FAX : 1-978-646-8600

TRANSACTIONS OF THE JAPANESE
SOCIETY OF IRRIGATION, DRAINAGE
AND RURAL ENGINEERING

No.262

Contents

Research Papers

The Simulation Model of Surface Soil Moisture for Estimation of Water Amount for Preventing Wind Erosion	ARIMORI M., ENDO Y. and KOBAYASHI T.	1
Effect of Limited-scale Improvement Works on the Maintenance of Food for Japanese Crested Ibis in Hilly and Mountainous Areas	SATO T., MISAWA S., YOSHIKAWA N. and TAKAHARA E.	7
The Effects of Log Mattress Bank Protection on Inhabitation Fish from Differences in Environment Settings	TAKAHASHI N., MIZUTANI M. and GOTO A.	17
Application of Mill Treatment to Digested Liquid for Agricultural Utilization	YAMAOKA M., NAKAMURA M. and YUYAMA Y.	27
Study on Verification of Reduction Function of Nutrient Load in the River by an Off-stream Type of Irrigation Pond	NAKAGIRI T., HORINO H. and MATSUSHIMA R.	35
Regional Estimation of LAI Based on Absorption and Dispersion Processes of Electromagnetic Wave in the Vegetation Canopy Using Satellite Data	SHIN Yonghee, SEGUCHI M. and KORIYAMA M.	41
Effects of an Ice Plate Formed by Inundation before the Continuous Snow Cover on Surface Soil Water after Disappearance of the Snow Cover at a Rotational Paddy in a Snowy Cold Region in the Period from Autumn of 2007 to Spring of 2008	MATSUDA S., MUKAI H. and SATO Y.	49
Mechanical Properties and Localization of Displacements in Soil Sampled on Farmland in Landslides	KAWAMOTO O., MIYAZAKI T. and NAKANO M.	57
Model Experiments and Elasto-Plastic Finite Element Analysis about Seepage Failure Behind Unfixed Sheet Pile with Displacement	OKAJIMA K., TANAKA T., Zhang Shanji and KOMATSU T.	67
Dielectric Approaches of Sediment-surface-level Estimation by Time Domain Reflectometry	ITO Y., MIYAMOTO H. and CHIKUSHI J.	75
Effects of the Combination of Sloped Farm Field, Crawler Compaction and Open Channels on Moisture and Hardness and Temperature of the Surface Soil Layer after Disappearance of the Snow Cover	MATSUDA S. and MUKAI H.	83

The Characteristics of the Small Damages and the Restoration Measures of Agricultural Infrastructure in the Mid-Niigata Prefecture Earthquake in 2004 ARITA H. and YUZAWA K. 89
Study on Influence Caused by Design and Operation Factors Contact Aeration Tank on Effluent ATU-BOD · N-BOD Concentrations from Sedimentation Tank in Rural Sewerage Facilities with Biofilm Processes NAKANO T. 95
Experiment of Burst Speed of Fingerling Masu salmon, <i>Oncorhynchus masou masou</i> , with Stamina Tunnel in the River IZUMI M., YAMAMOTO Y., YATAYA K. and KAMIYAMA K. 103
Large Scale Experiments on Lightweight Thrust Restraint for Buried Bend under Internal Pressure KAWABATA T., SAWADA Y. and MOHRI Y. 111

Technical Papers

Geographic Trend Analysis of Depopulated and Aging Areas in Saga Based on Web-browsing Community Database MIYAMOTO H., KITAGAWA K. and KOUMOTO T. 119
Experimental Study on Basic Shape of Simple Device for Prevention of Inflow and Accumulation of Buoyant Refuse at the Intake of Headworks NAMIHARA A., KOBAYASHI H., TAKAKI K. and GOTO M. 125
Vicissitude and Durability Age of the "Pore System Formed by Roots" in Volcanic Ash Soil Formation at the Northern Iwate Prefecture TOKUNAGA K., SATO K., SASAKI C., SASE T. 133

Notice for Photocopying

If you wish to photocopy any work of this publication, you have to get permission from the following organization to which licensing of copyright clearance is delegated by the copyright owner.

〈All users except those in USA〉

Japan Academic Association for Copyright Clearance (JAACC)
6-41 Akasaka 9-chome, Minato-ku, Tokyo 107-0052, Japan
Phone : 81-3-3475-5618 FAX : 81-3-3475-5619 E-mail : info@jaacc.jp

〈Users in USA〉

Copyright Clearance Center, Inc.
222 Rosewood Drive, Danvers, MA 01923 USA
Phone : 1-978-750-8400 FAX : 1-978-646-8600

TRANSACTIONS OF THE JAPANESE
SOCIETY OF IRRIGATION, DRAINAGE
AND RURAL ENGINEERING
No.263

Contents

Research Papers

Study of the Effect of Specimen Shape in Direct Tension Tests on Cohesive Soil	NISHIMURA S. ... 1
Study on the Optimal Irrigation Method for Wind Erosion Prevention by the Simulation	ARIMORI M., ENDO Y. and KOBAYASHI T. ... 7
Fundamental Experiment to Determine Escape Countermeasures for Frogs Falling into Agricultural Canals – Angle of wall slope and hydraulic conditions of agricultural canals from which Tokyo Daruma Pond Frogs (<i>Rana porosa porosa</i>) can escape easily –	WATABE K., MORI A., KOIZUMI N. and TAKEMURA T. ... 15
The Method of Evaluation and Implementation of the Non-destructive Test on Aggregate denuded Concrete Structure for Irrigation and Drainage	OGATA H., SATO S. and HATTORI K. ... 23
Effect of Mixing Sludge Dredged from Farm Ponds with Weathered Granite Soil on Germination and Growth of Plant	TAKISAWA T., MURAKAMI A., NISHIMURA S. and MURAKAMI K. ... 33
Characteristics of Hydrological Runoff in an Artificial Coniferous Forest with Delayed Thinning and Its Long-term Changes	TAKEDA I., FUKUSHIMA A. and SOMURA H. ... 41
Analysis of One-Dimensional Unsteady Open Channel Flow Applying Space-Time Conservation Method	KIMURA M., SHIMADA M., TOGAWA K. and TANAKA T. ... 49
Effect of Cropping History on Water Retention Characteristics of Clayey Paddy Soil under Low Water Potential Conditions	ADACHI K., YOSHIDA S., OHNO S. and OBARA H. ... 57
Physical Properties of Soil and Development of Effective Reclamation Method for Sloped Farm Field	WAKASUGI K. and FUJIMORI S. ... 65
Soil Hydrophobicity in Andisol under Soil Surface Burning	OBUCHI A., MIZOGUCHI M., NISHIMURA T., IMOTO H., and MIYAZAKI T. ... 73
Coupled Measurement of Sediment-surface-level and Electrical Conductivity in Water by Time Domain Reflectometry	ITO Y., MIYAMOTO H. and CHIKUSHI J. ... 81

Field Measurement of Rainfall Infiltration in Capillary Barrier of Soil and Determination of Its
Divergence Length

..... MORII T., TAKESHITA Y., INOUE M. and MATSUMOTO S. ... 91

Technical Papers

Proposal of a Fish Habitat Environmental Model at Hill-bottom Valleys Waters In Tochigi Prefecture

..... KAKINO W., MIZUTANI M. and GOTO A. ... 99

Estimating the Length of Sections of Saline Groundwater Infiltration into Sewage Pipes for Use of
Treated Wastewater as Irrigation Water

..... YAMASHITA T. and SHIOZAWA S. ... 109

Notes

Estimation of Basic Nutritious Substance for Ecosystem by Stable Isotope Ratio Method in the Ditches
at a Hill-bottom Paddy Field

..... MATSUZAWA S., MORI A. and MIZUTANI M. ... 117

Evaluation Method for Applicability of the Electrokinetic Method to Polluted Farmland Soil by Simple
Laboratory Experiment

..... HITOMI T., KUBOTA T., MIENO T., SHIOHAMA K., HAMADA Y. and SHIRATANI E. ... 119

Notice for Photocopying

If you wish to photocopy any work of this publication, you have to get permission from the following organization to which licensing of copyright clearance is delegated by the copyright owner.

⟨All users except those in USA⟩

Japan Academic Association for Copyright Clearance (JAACC)

6-41 Akasaka 9-chome, Minato-ku, Tokyo 107-0052, Japan

Phone : 81-3-3475-5618 FAX : 81-3-3475-5619 E-mail : info@jaacc.jp

⟨Users in USA⟩

Copyright Clearance Center, Inc.

222 Rosewood Drive, Danvers, MA 01923 USA

Phone : 1-978-750-8400 FAX : 1-978-646-8600

TRANSACTIONS OF THE JAPANESE SOCIETY OF IRRIGATION, DRAINAGE AND RURAL ENGINEERING

No.264

Contents

Research Papers

Optimal Allocations of Maximum Allowable Load among Influent Rivers: An Application for Strategic Management of Lake Water Quality	MAEDA S., KAWACHI T., UNAMI K. and TAKEUCHI J. ... 1
Irrigation and Drainage Components in a Paddy Plot with Fish Ladder	NAKAMURA K., FUKAMI A., HORINO H., NAKAGIRI T. and SAKATA S. ... 9
Impacts of Application of Methane Fermentation Digested Liquid on Green House Gas Emissions and Nitrogen Leaching from Upland Field	NAKAMURA M., FUJIKAWA T., YUYAMA Y., MAEDA M. and YAMAOKA M. ... 17
Formation of Land Use Order in Hamamatsu City under the Original Criteria of the Farm Land Exclusion from the Agricultural Promotion Area	ARITA H. and MIYAZAWA S. ... 27
An Inverse Method to Estimate Unsaturated Hydraulic Conductivity in Seepage Flow in Non-isothermal Soil	IZUMI T., TAKEUCHI J., KAWACHI T. and FUJIHARA M. ... 35
Mechanism of Fracture of Concrete Canal Joints during the Niigataken Chuetsu-oki Earthquake	MORI T., MORI M., TOKASHIKI M. and NAKAYA T. ... 43

Technical Papers

Features of River Flow in Inland Valleys in Semi-Deciduous Forest Zone in Ghana	FUJII H., DAWUNI Busia , KULAWARDHANA Wasantha, THENKABAIL Prasad and NAMARA Regassa ... 49
Analyzing the Present State of Assistance Projects to Evaluate Sustainability for Participatory Irrigation Management	ONIMARU T. and SATOH M. ... 57
— Case of eight technical cooperation projects by Japan's official development assistance —	
Deterioration Prediction Model of Irrigation Facilities by Markov Chain Model	MORI T., NISHINO N. and FUJIWARA T. ... 69

Notes

Trial of Constructing a Fishway Using Waterbags

..... TAKEMURA T., WATABE K., MORI A., KOIZUMI N. and MIZUTANI M. 79

Decrease of Heavy Metal Non-Point Runoff Using Porous Concrete

..... HARADA S. and KOMURO Y. 81

Notice for Photocopying

If you wish to photocopy any work of this publication, you have to get permission from the following organization to which listing of copyright clearance is delegated by the copyright owner.

⟨All users except those in USA⟩

Japan Academic Association for Copyright Clearance (JAACC)

6-41 Akasaka 9-chome, Minato-ku, Tokyo 107-0052, Japan

Phone : 81-3-3475-5618 FAX : 81-3-3475-5619 E-mail : info@jaacc.jp

⟨Users in USA⟩

Copyright Clearance Center, Inc.

222 Rosewood Drive, Danvers, MA 01923 USA

Phone : 1-978-750-8400 FAX : 1-978-646-8600